



LIQUID AND GRIT

Slots Design Report

Competitive research and data insights for slots designers

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JULY

2017

INTRODUCTION



Dear Slots Designer,

“A good hockey player plays where the puck is. A great hockey player plays where the puck is going to be.” – Wayne Gretzky

This month we continue to see innovation in jackpot triggers. Caesars Slots’ *Rapid Fire: Liberty Bash* machine offers three different ways for players to win jackpots. The combination of progressive jackpots with jackpots (stand alone) continues to grow in popularity. This mechanic is included in Heart of Vegas’ two new *Lightning Link* machines. See New Innovations and Market Trends for details.

Up-and-coming trends in social casino include ‘wheels only’ and progression systems during the bonus game. Adding a progression system to the bonus game makes it even harder to complete, which is a great system for high value players.

Consider adding lines and pays during the bonus game to increase volatility for players. Two examples of how to improve reels for players include: a Feature Repeat Win, adopted in House of Fun’s *Texas Bighorn*, and additional lines added to a flipped reel set, used in Hot Shot Casino’s *Dean Martin’s: Vegas Shindig*.

In this report, you will find new statistical details in the Deep Dives, including a breakdown of the bonus game RTP, and raw win and bonus game win distribution.

Play where the puck is going.

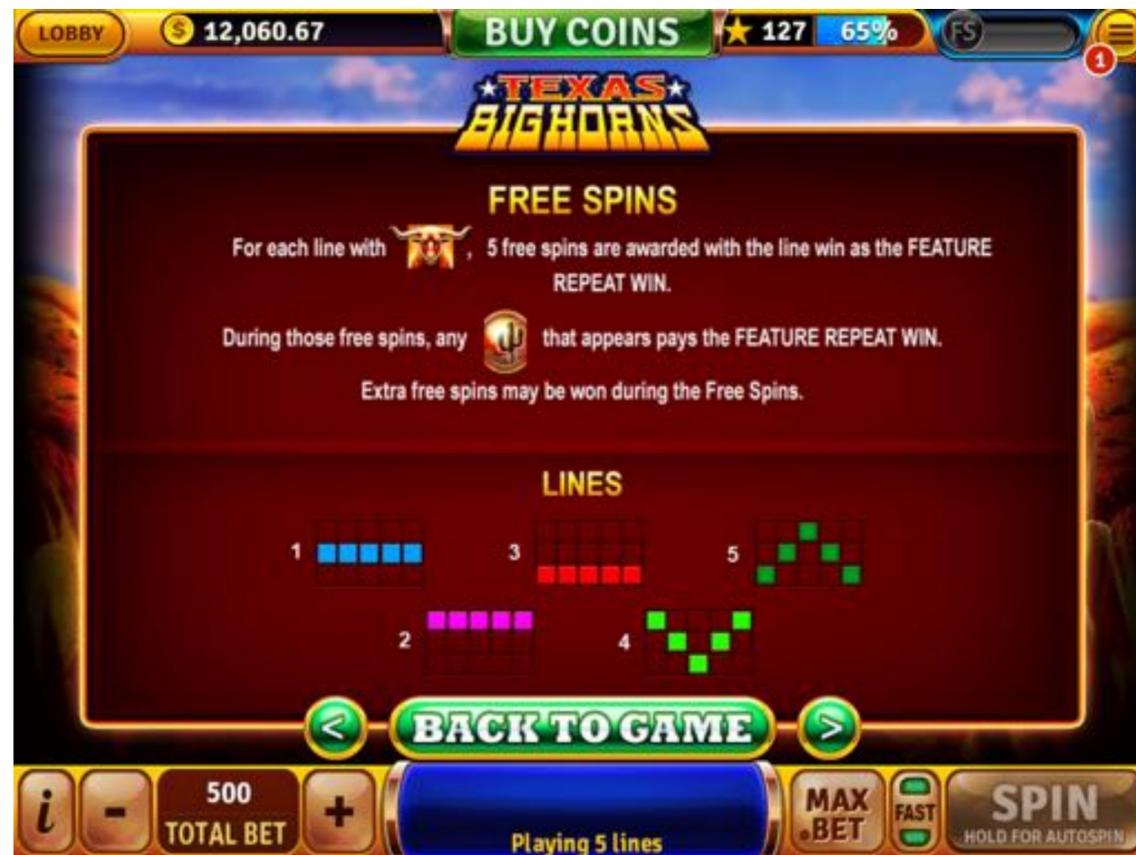
Brett Nowak
Editor-in-Chief

NEW INNOVATIONS

REPEAT WIN SYMBOLS

Add a *Repeat Win* symbol during free spins to produce a highly volatile, yet simple, machine for players to easily understand and win big

Pay Table



House of Fun's *Texas Bighorns*, a very similar machine to Aristocrat's *Big Red*, triggers *Repeat Wins* during the free spins on a 3 x 5, five line machine

Hit Sequence



When the cactus symbol lands anywhere during free spins, the symbol pays the amount listed at the top of the reel set. In this example, the symbol pays \$7.5K every time it hits

MULTIPLE JACKPOT WINS

Allow players multiple different mechanics to win jackpots within one machine

Pay Table



In Caesars Slots' *Rapid Fire: Liberty Bash*, players may win the jackpot one of three ways: hitting five or more *Rapid Fire* symbols, hitting a jackpot on one of the mini-steppers, or progressing to a jackpot on the *Rising Jackpot Bonus*

Hit Sequence



Players may hit a jackpot by first triggering the mini-stepper machine within a 3 x 5 reel set and then hitting the jackpot combination. See the three *Liberty Bell* symbols above for an example

Jackpot Sequence



Players may also win a jackpot by triggering the *Rising Jackpot Bonus* and successfully progressing up to the five jackpots at the top

STOPPER SYMBOLS

Change the win visual by adding *Stopper Symbols* to the reel set. Reward players for rows without *Stopper Symbols*

Pay Table



In Hot Vegas Slots' *Bounty of Blossoms*, players win any line without *Stopper Symbols*

Hit Sequence



In the example above, the player is awarded the first and third rows as no *Stopper Symbols* are present on those rows

Free Spins



Two bonus symbols trigger the free spins. The free spins end when two *Bonus Symbol Scatters* land

BONUS GAME WHEELS

Impress players with multiple bonus games that are chosen with a wheel at the top of the reel set

Pay Table



In Caesars Slots' *Dreaming of Oz* there are four bonus games

Hit Sequence



Hitting three bonus symbols triggers the wheel at the top of the reel set. Then, the wheel spins and selects the bonus game

Win Dialogue



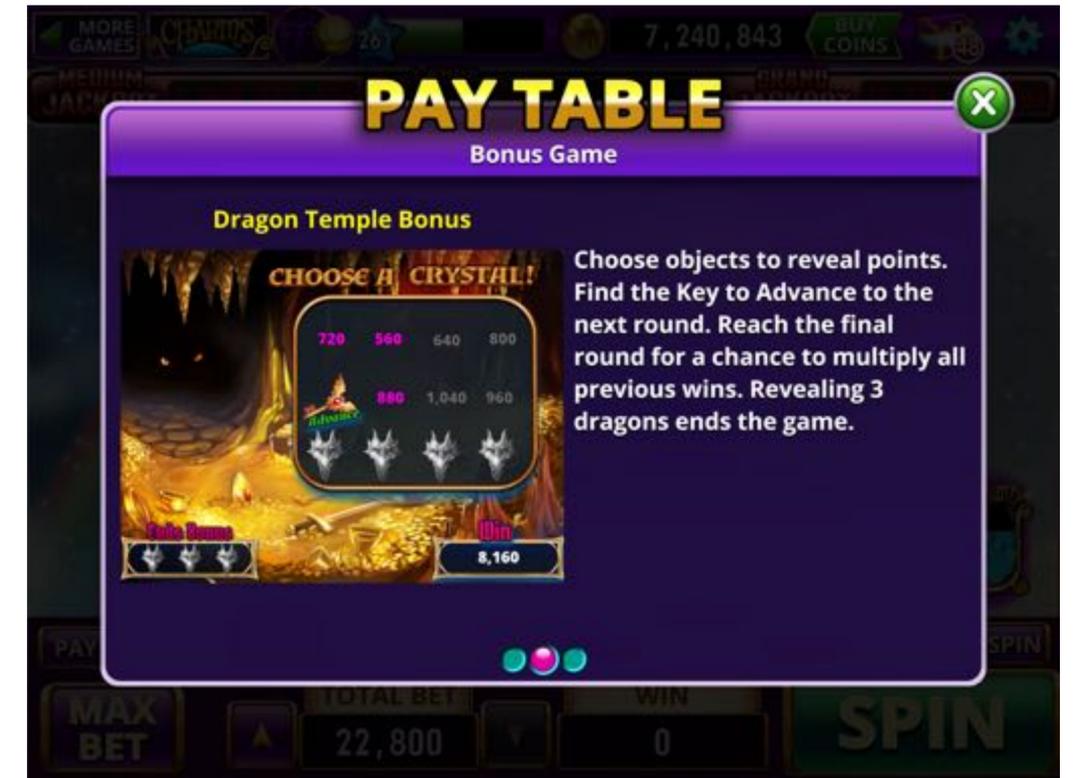
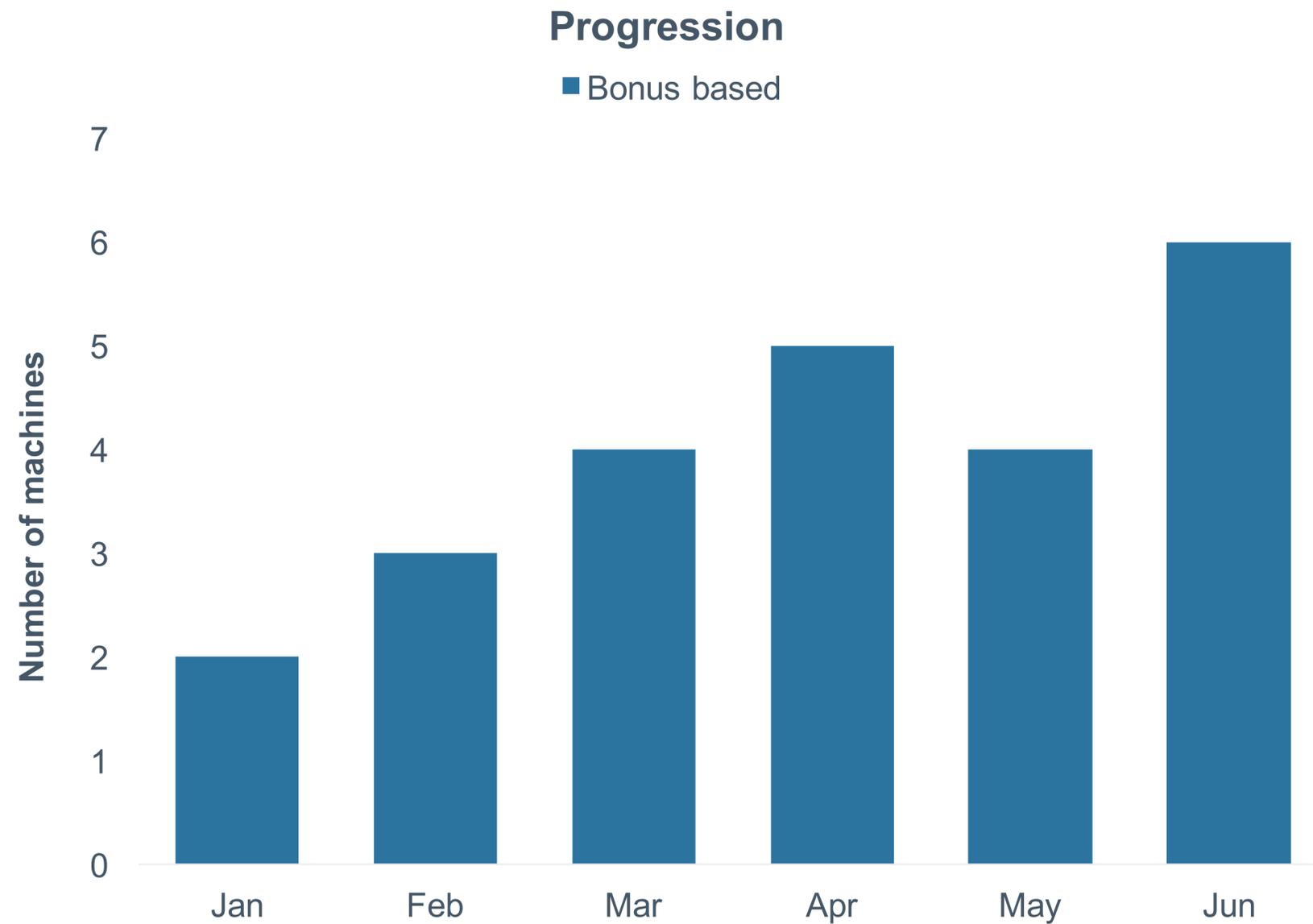
The players are informed about the bonus after it is selected. In this example, the player won the *Traveling Multiplier Free Spins* that awards five free spins

MARKET TRENDS

Apps included in the trend data: DoubleDown Casino, Heart of Vegas, House of Fun, Gold Fish Casino, Slotomania, Jackpot Party, Hit it Rich, Caesars Slots, Quick Hit Slots, and Hot Shot Casino

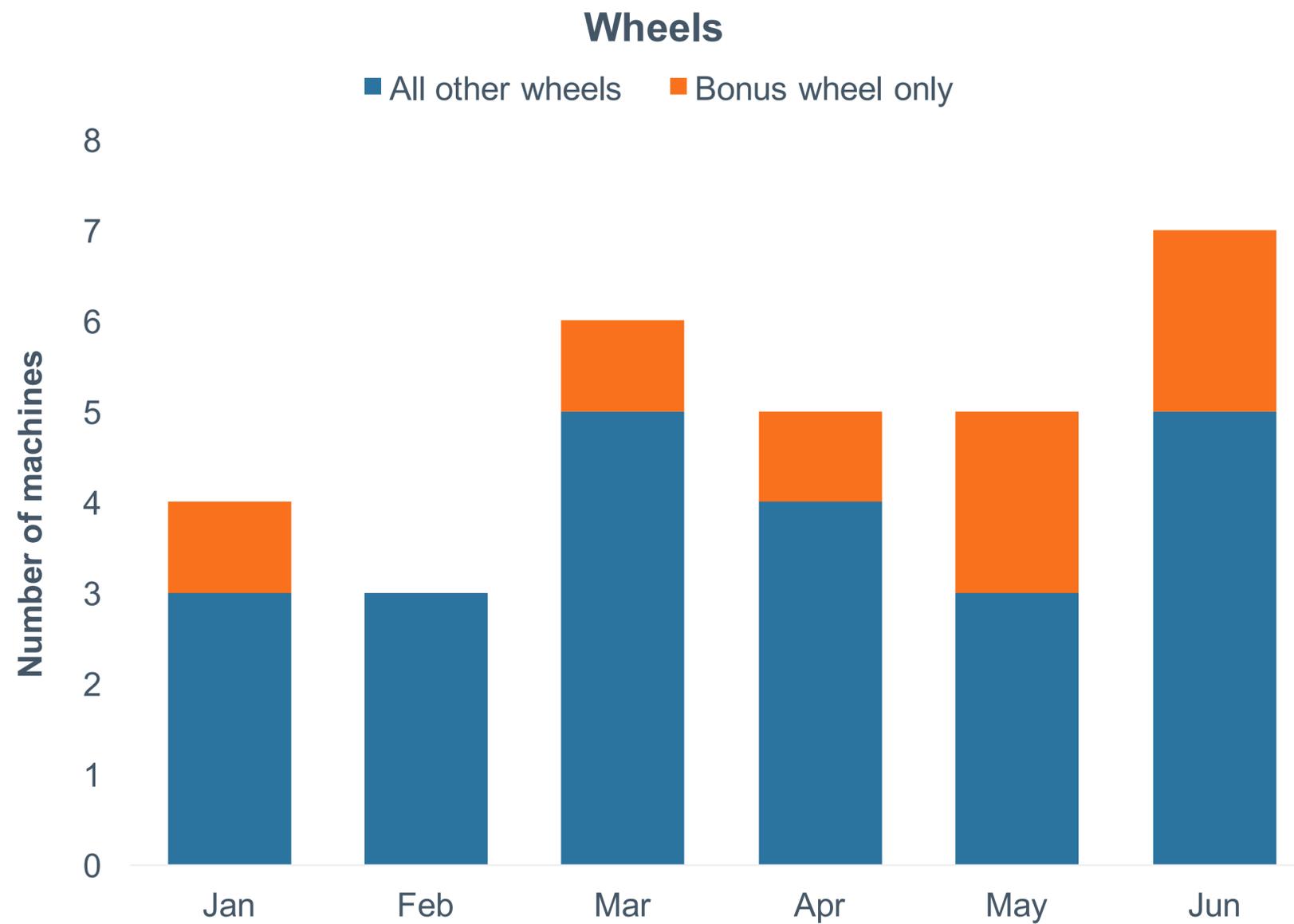
PROGRESSION

Progression added to the bonus system is an up-and-coming way to provide serious players with more difficult progression



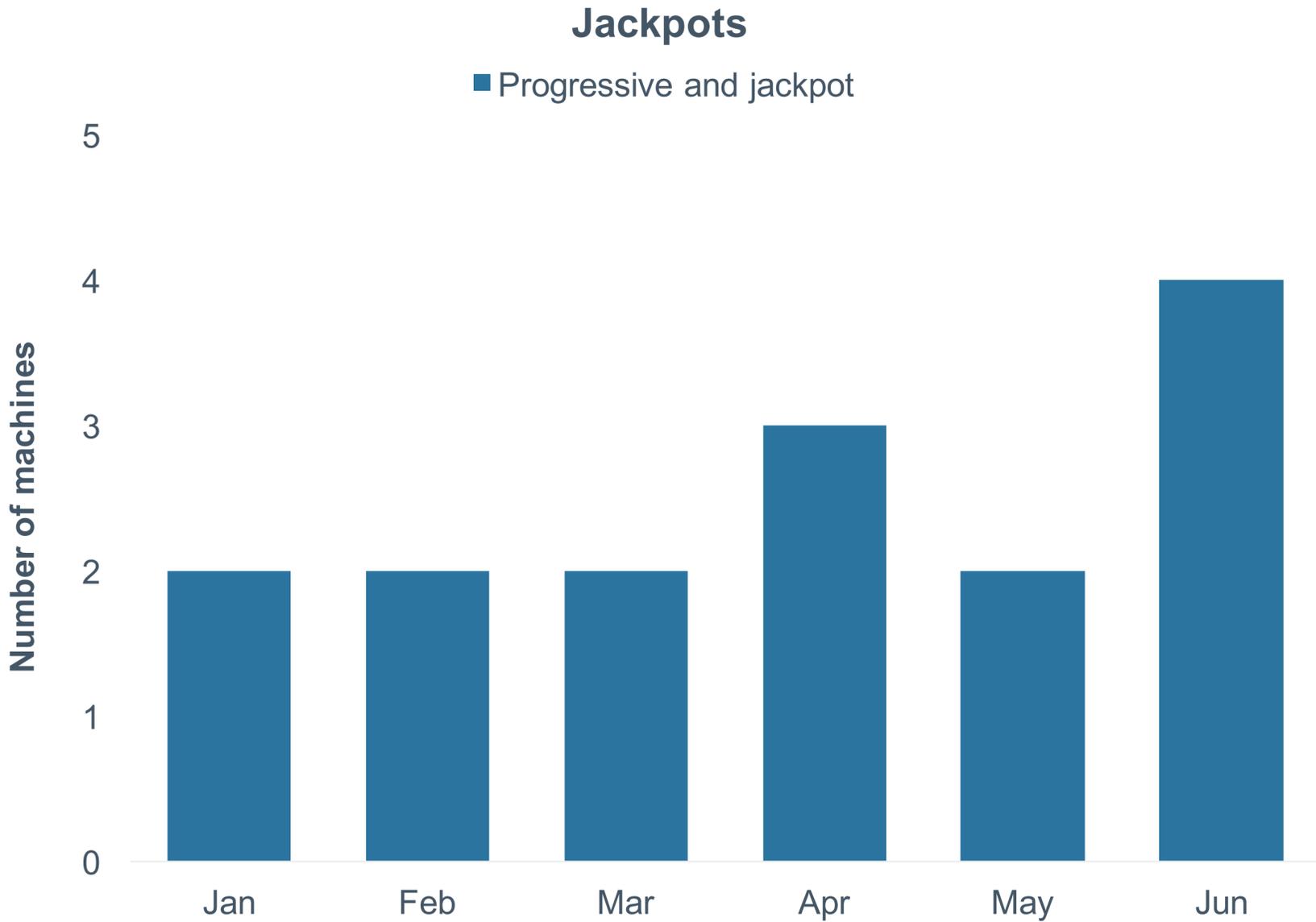
WHEELS

Wheels are becoming more prevalent in social. A stand alone wheel during the bonus is on the rise



JACKPOTS

Combining progressives and jackpots continues to rise as a popular mechanic giving players the chance to win a jackpot *and* a huge progressive jackpot all in one machine



DEEP DIVES

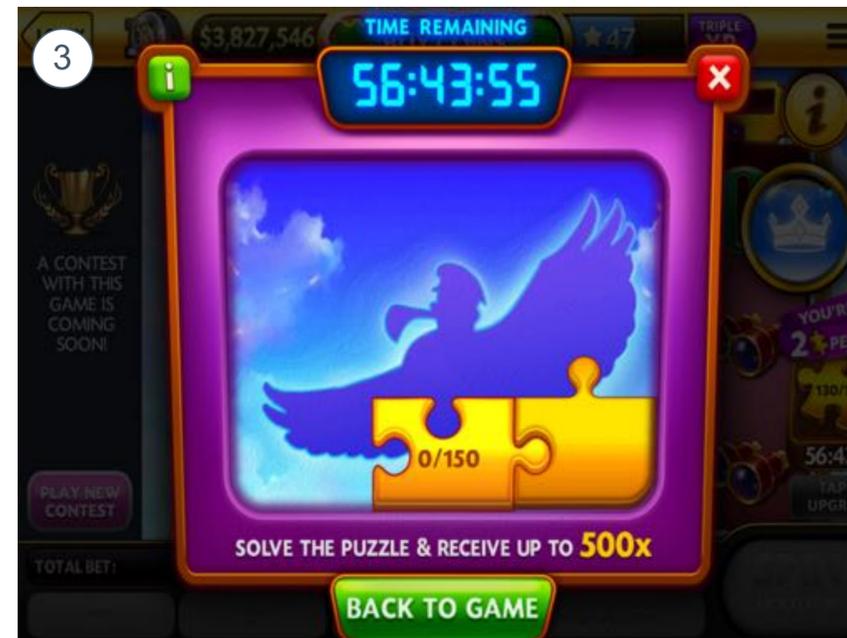
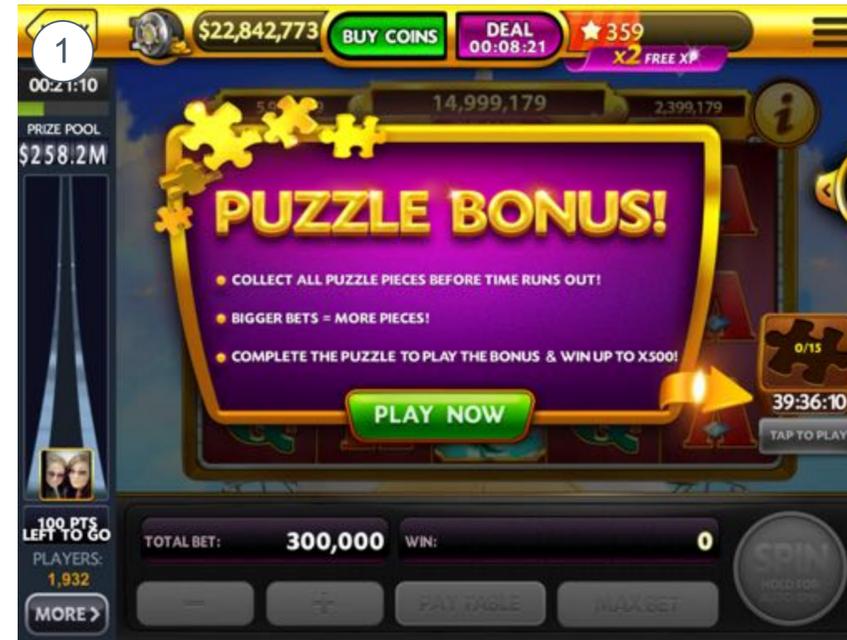
SOCIAL

- *Captain Pelican* – Caesars Slots
- *Wheel of Fortune* – Old Vegas Slots
- *Hoppin' Fish* – myKONAMI Slots
- *Steampunk: Pentagears* – DoubleU Casino

CAPTAIN PELICAN

Introduce a timed collection feature to increase bets per spin and spins per day

- Caesars Slots' *Captain Pelican* features an in-machine *Puzzle Bonus* (image 1).
- A certain bet is required to activate the *Puzzle Bonus*. Up to seven puzzle pieces may appear per spin, depending on the bet amount. The higher the bet, the more potential pieces may land.
- Qualified players collect puzzle pieces during play to complete a collection goal. Each puzzle piece has a collection goal, such as: 'collect 150 pieces.' Progress is displayed with a timer and a 'Tap To Upgrade' button (image 2).
- When a collection goal is complete, one of nine puzzle pieces is added to the puzzle (image 3).
- Completing the *Puzzle Bonus* before the timer runs out triggers a pick'em bonus for a coin prize (image 4).



CAPTAIN PELICAN STATS

Game play

Hit frequency	21%
Volatility	10.9
Spins until a bonus	63

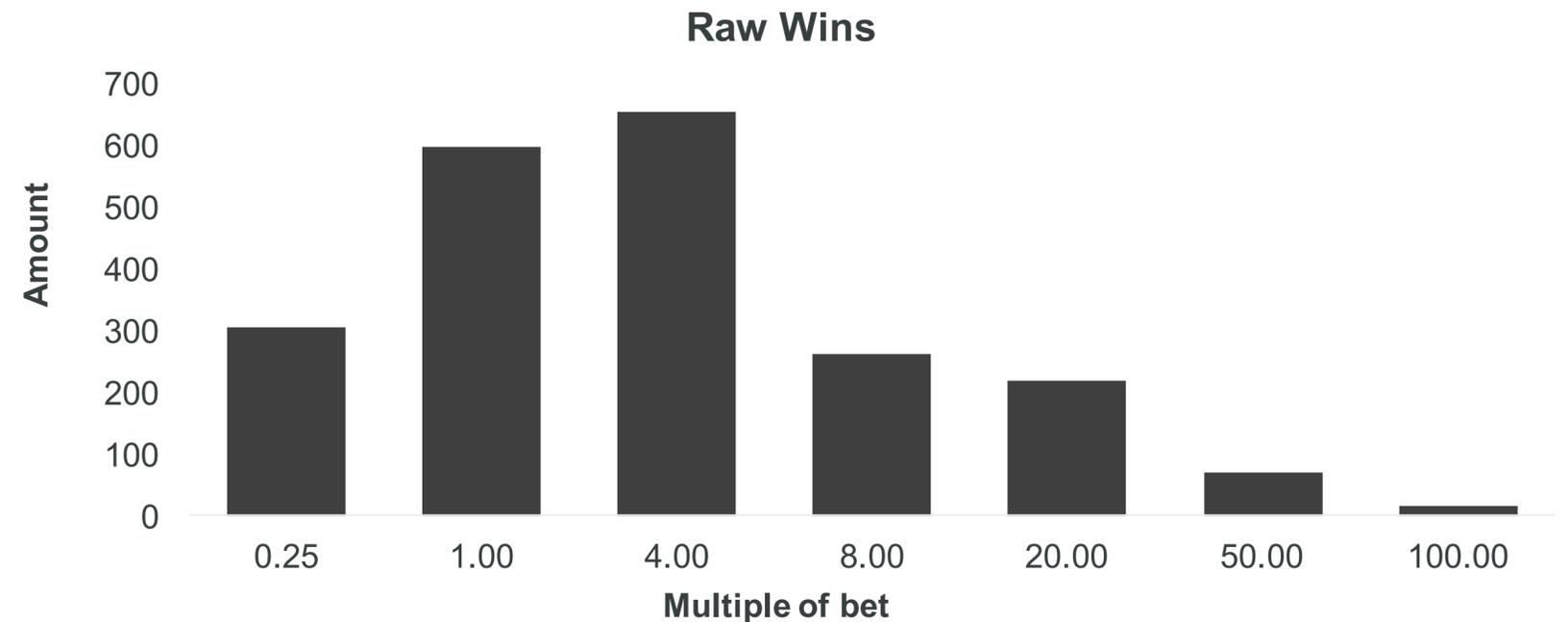
Distribution of RTP as % of total RTP

Base game	63%
Bonus games	37%
Free spins	28%
Puzzle bonus	2%
Jackpots	8%

RTP range

Minimum range	83%
Median	101%
Maximum range	119%

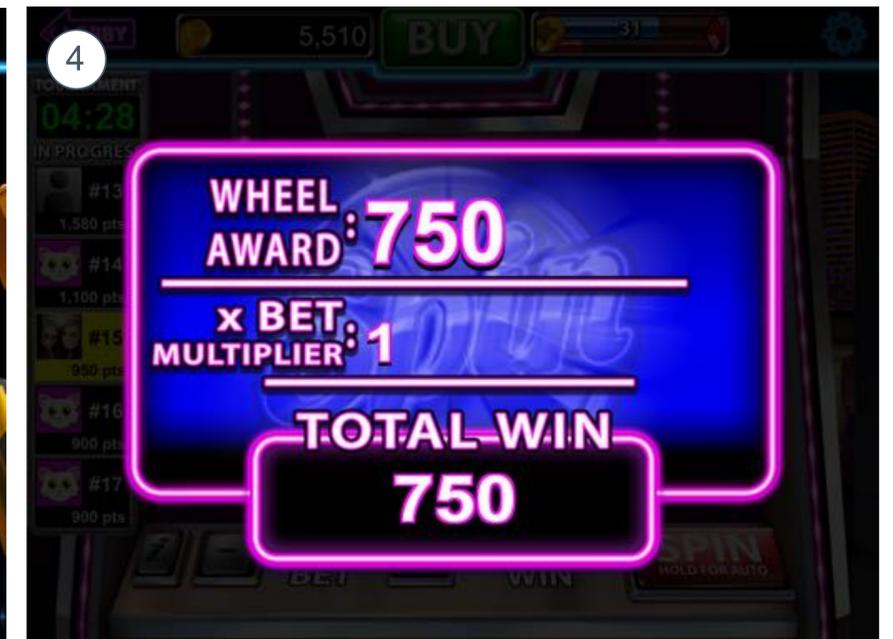
- Volatility is the standard deviation of the 10K payouts
- The distribution of RTP is base or bonus game RTP over total RTP
- RTP range is 90% confidence with 10K spins
- More info on our data collection process is in the Appendix



WHEEL OF FORTUNE

Capitalize on the *Wheel of Fortune* machine brand popularity by adding similar versions to the lineup

- Old Vegas Slots released its version of the popular *Wheel of Fortune* machine with a 2 x 3 classic stepper (image 1).
- Three scattered 'Spin' symbols landing on each reel trigger the *Wheel Bonus* (image 2).
- The *Wheel Bonus* displays various prize amounts with a 'Spin' button in the center (image 3).
- Players are notified of the amount won with a dialogue displaying the wheel award and bet multiplier (image 4).



WHEEL OF FORTUNE STATS

Game play

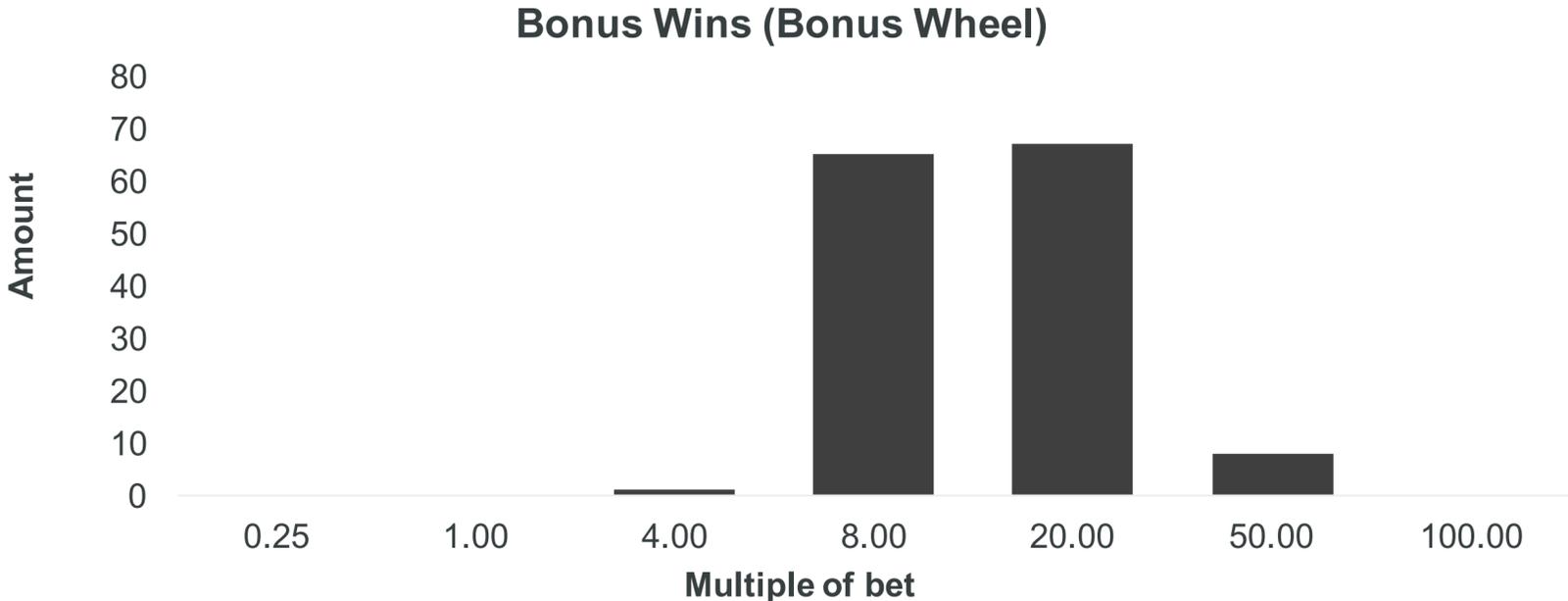
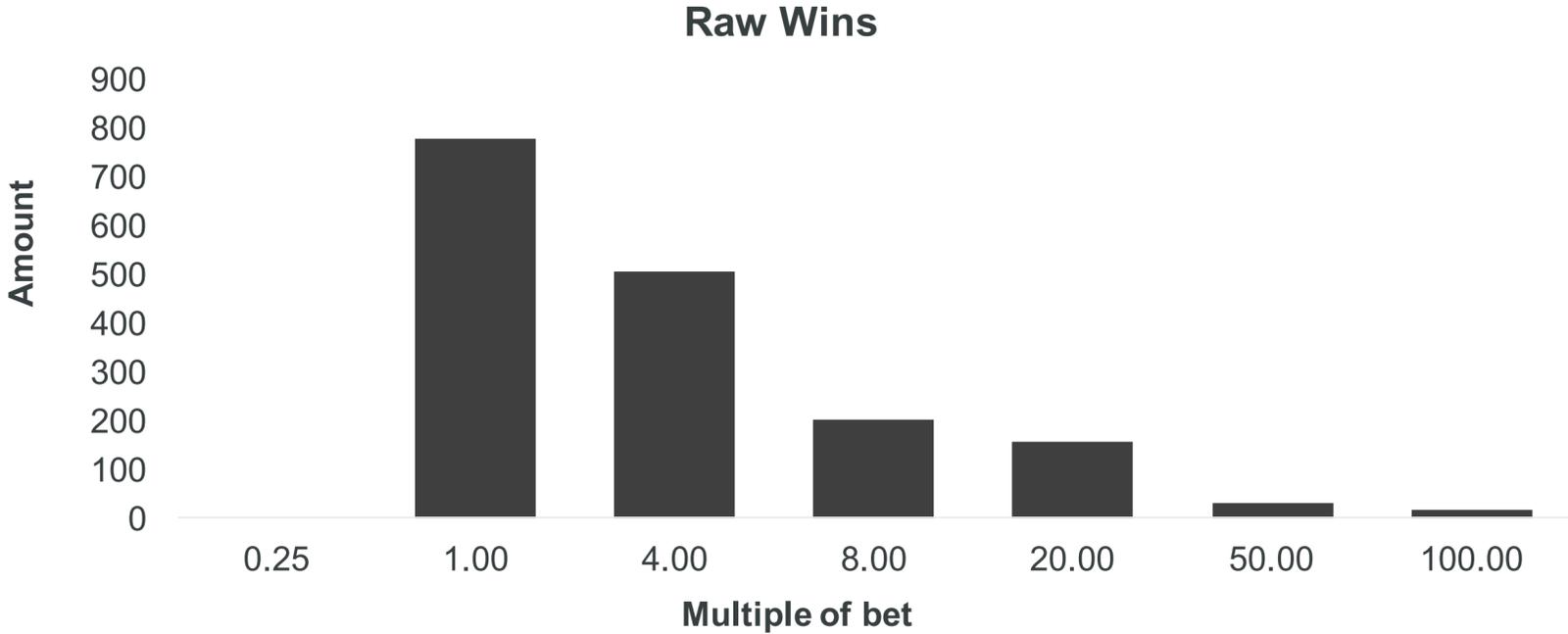
Hit frequency	17%
Volatility	5.7
Spins until a bonus	68

Distribution of RTP as % of total RTP

Base game	69%
Bonus game	31%

RTP range

Minimum range	75%
Median	85%
Maximum range	94%



HOPPIN' FISH

Introduce a 'last chance' feature to bonuses that provides players a re-spin at the end of free games

- myKONAMI's *Hoppin' Fish* features a progressive jackpot above a 3 x 5 reel set (image 1).
- Three or more fishbowl symbols landing triggers ten free games (image 2).
- During free games, each goldfish wild appearing on the reels is collected and transferred to the corresponding space of the fishbowl (image 3).
- At the conclusion of free spins, the *Hoppin' Fish* feature begins. The fishbowl appears with all the collected goldfish wilds locked into place. Players are awarded one spin with this configuration of wilds (image 4).



HOPPIN' FISH STATS



Game play

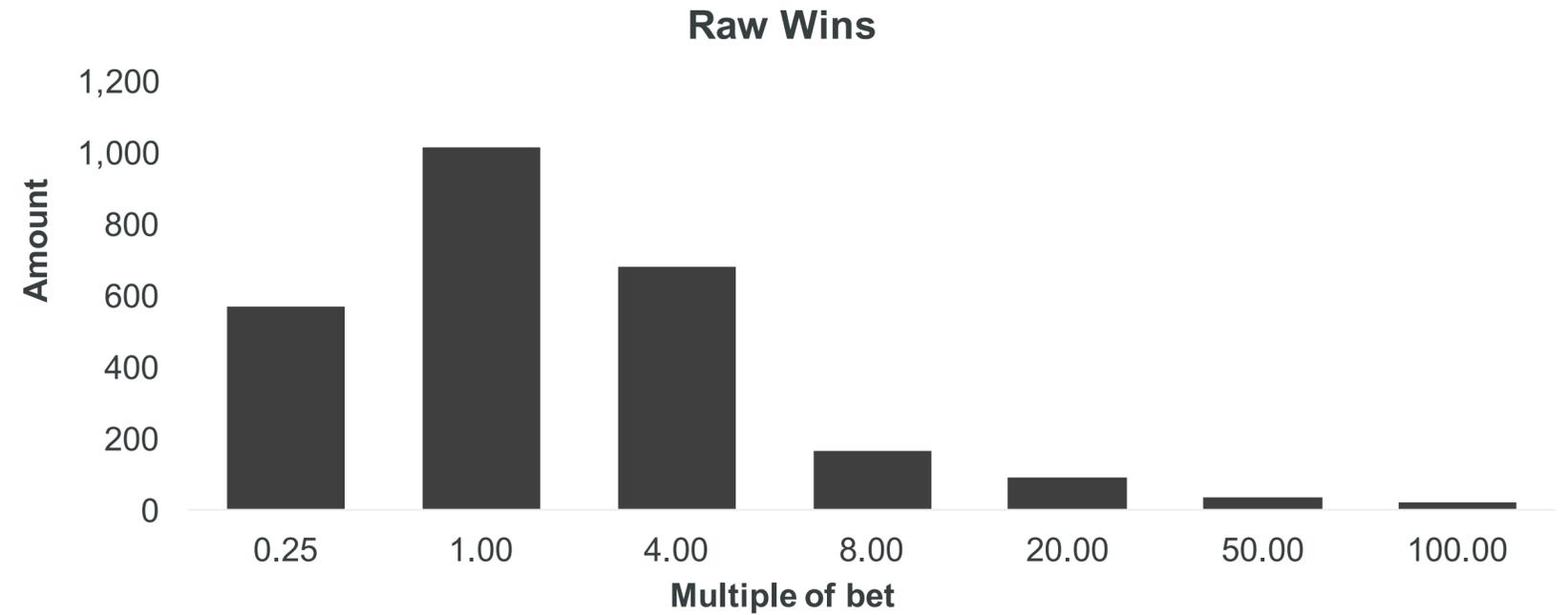
Hit frequency	26%
Volatility	5.7
Spins until a bonus	156

Distribution of RTP as % of total RTP

Base game	60%
Bonus game	40%

RTP range

Minimum range	64%
Median	74%
Maximum range	83%



STEAMPUNK PENTAGEARS

Entice players with meter mechanics that unlock additional bonus pays

- DoubleU Casino's *Steampunk PentaGears* is a 4 x 5 reel set that offers a progressive jackpot and a fill meter to trigger win multipliers and bonus rounds (image 1).
- During base game play, gear symbols fill the meter by landing on the reels and award a win multiplier for that spin (image 2).
- Four gears landing on the reels awards the appropriate multiplier for that spin and triggers a free spin bonus round with x3 multiplier wilds (image 3).
- Gears landing on all five reels trigger free spins with multiplier wilds and a win multiplier for the entire free spin bonus round (image 4).



STEAMPUNK PENTAGEARS STATS

Game play ¹

Hit frequency	51%
Volatility	10.7
Spins until a bonus	48

Distribution of RTP as % of total RTP ¹

Base game	40%
Bonus game	60%

RTP range ¹

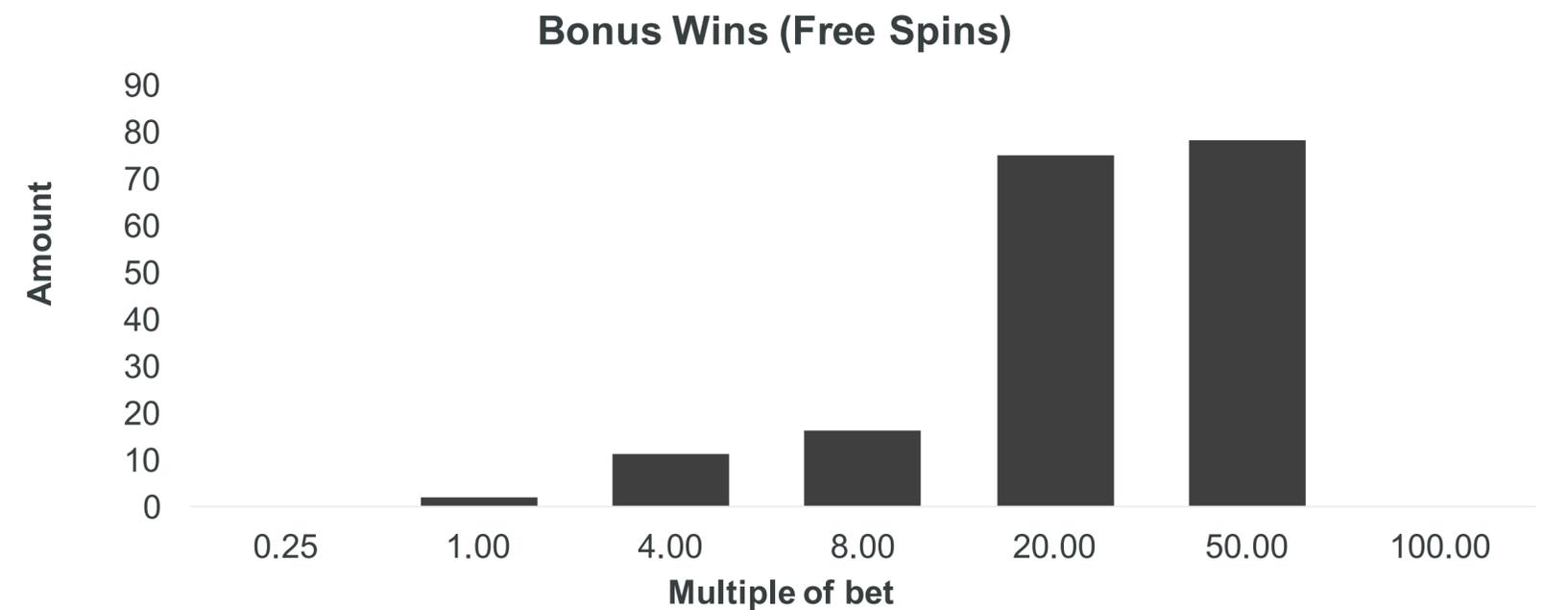
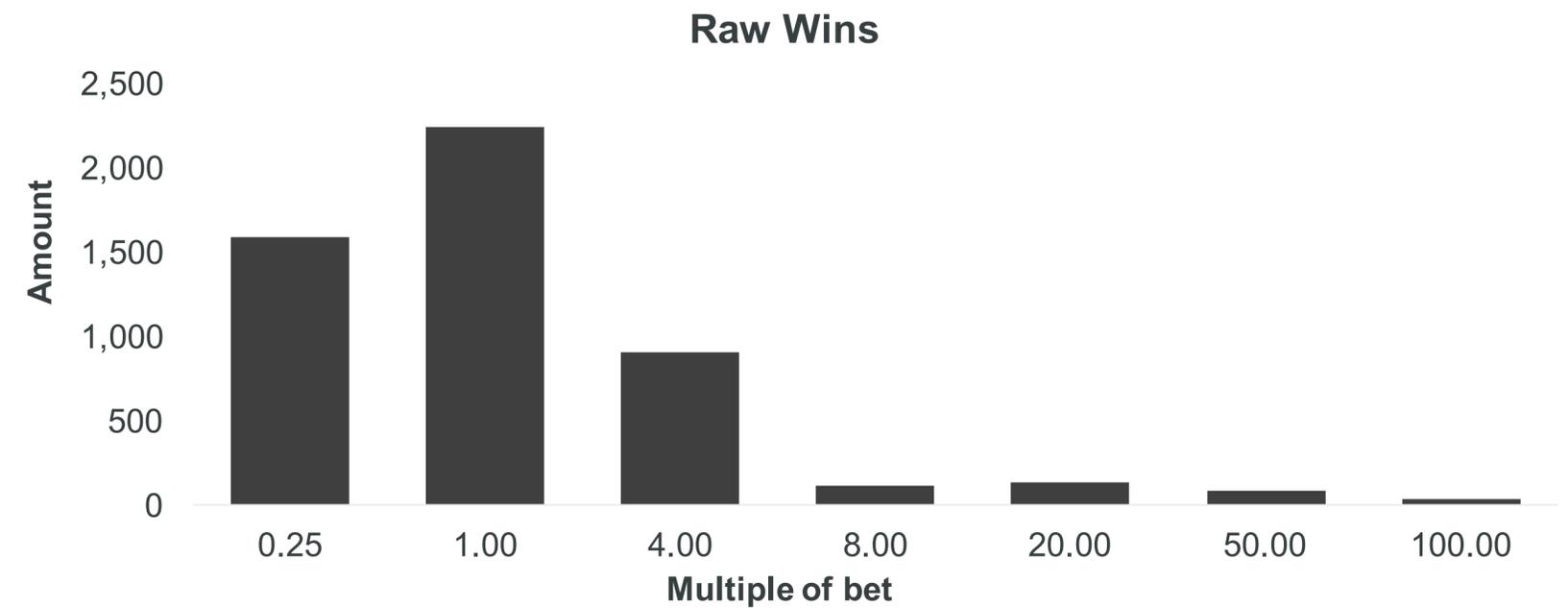
Minimum range	92%
Median	110%
Maximum range	128%

Jackpots ¹¹

Number of jackpots	1
Multiple of bet	5,400K

¹ Jackpots were removed from the information

¹¹ Jackpots are payouts equal to or larger than 1,000x the bet



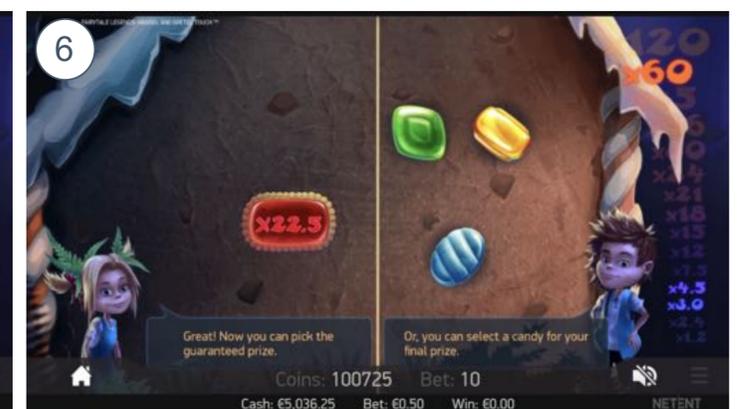
REAL MONEY

- *Fairytales Legends: Hansel & Gretel* – NetEnt
- *Lady of Egypt* – SC Interactive

FAIRYTALE LEGENDS

Incorporate a *Deal or No Deal* mechanic into pick'em bonuses to give players additional bet choices

- NetEnt's RMG machine *Fairytale Legends: Hansel & Gretel* offers a multi-way 3 x 5 reel set that pays any three-in-a-row, regardless of reel placement (image 1).
- Anytime during play, a full reel wild landing on the reels triggers a re-spin. Multiple re-spins may be triggered (image 2).
- A fairy may appear randomly during play and grant one of three features: *Fairy Wonder Spin*, *Fairy Surprise*, or *Fairy Wild Spin* (image 3).
- Chests landing on reels 1, 3, and 5 trigger an on-reel pick'em for coins, free spins, or the *Candy House Bonus* (image 4).
- In the *Candy House Bonus*, players choose three out of 15 candies. The possible multipliers are displayed along the side of the bonus (image 5).
- After each pick, candies and corresponding multipliers not chosen disappear. Players are then given the option to take the average of the three remaining candy and multipliers on the left, or pick one of the three candies on the right (image 6).



FAIRYTALE LEGENDS STATS

Game play

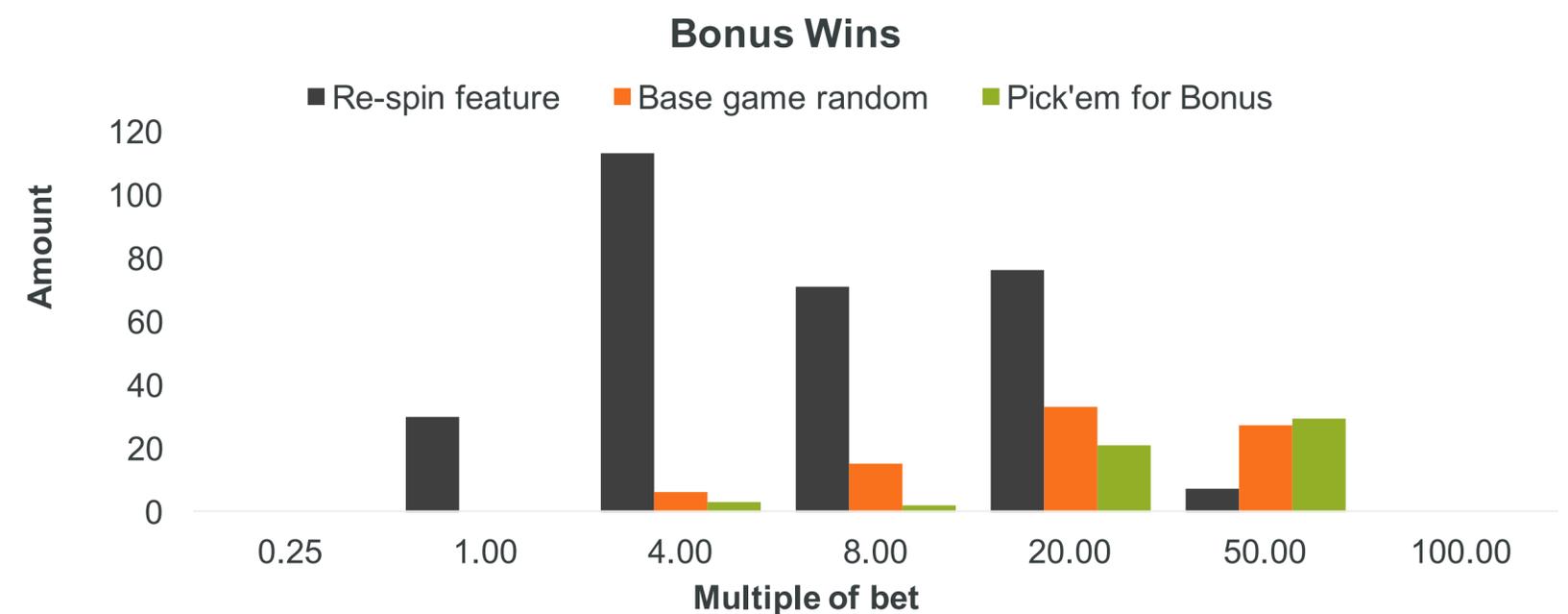
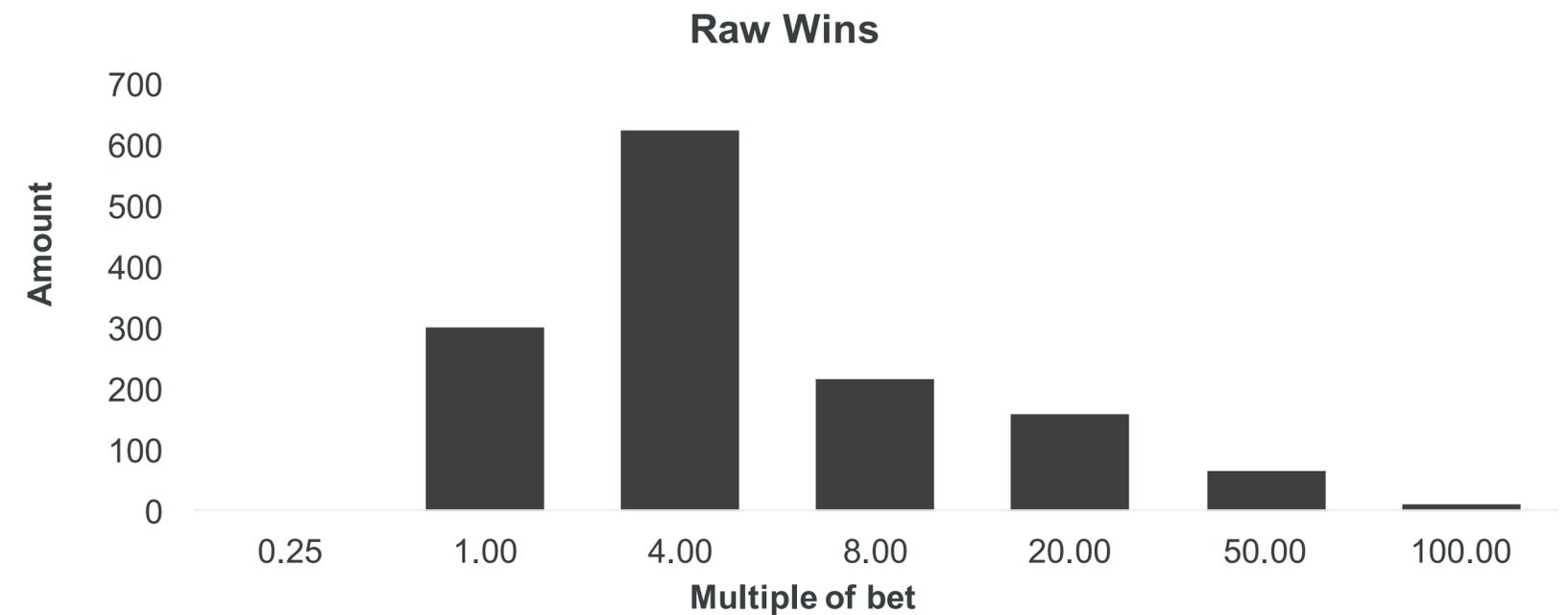
Hit frequency	14%
Volatility	4.1
Spins until a bonus	19

Distribution of RTP as % of total RTP

Base game	32%
Bonus games	68%
Re-spin feature	20%
Base game random	14%
Pick'em for bonus	19%

RTP range

Minimum range	73%
Median	79%
Maximum range	86%



LADY OF EGYPT

Create innovative reel mechanics and combination pays to increase player engagement and drive retention

- SG Interactive's *Lady Of Egypt* RMG has a total reel set of 3 x 10 with a 3 x 3 active reel array displayed by a frame (image 1).
- Winning combinations that appear within the active frame will trigger *Speed Spins* causing the reel array to shift over two reels and increase the *Speed Spins Multiplier* (image 2).
- An *Extended Pay* feature is available for full reels of one symbol, or a combination of specific symbols within the active frame. When *Extended Pay* has been triggered, a colossal symbol appears (image 3).
- Winning combinations through reels 7, 8, and 9 will award a spin of the 10th reel for a chance of a 350x to 1,000x bet multiplier or a jackpot. The jackpot symbol landing mid-reel will randomly award: *Grand Jackpot*, *Major Jackpot*, or *Minor Jackpot* (image 4).
- Free spins are triggered by three or more bonus symbols landing anywhere on the 3 x 10 reel set (image 5).
- Wild symbols appear on reels 2, 4, 6, and 8 anytime during play and additional full reel wilds appear during free spins (image 6).



LADY OF EGYPT STATS

Game play

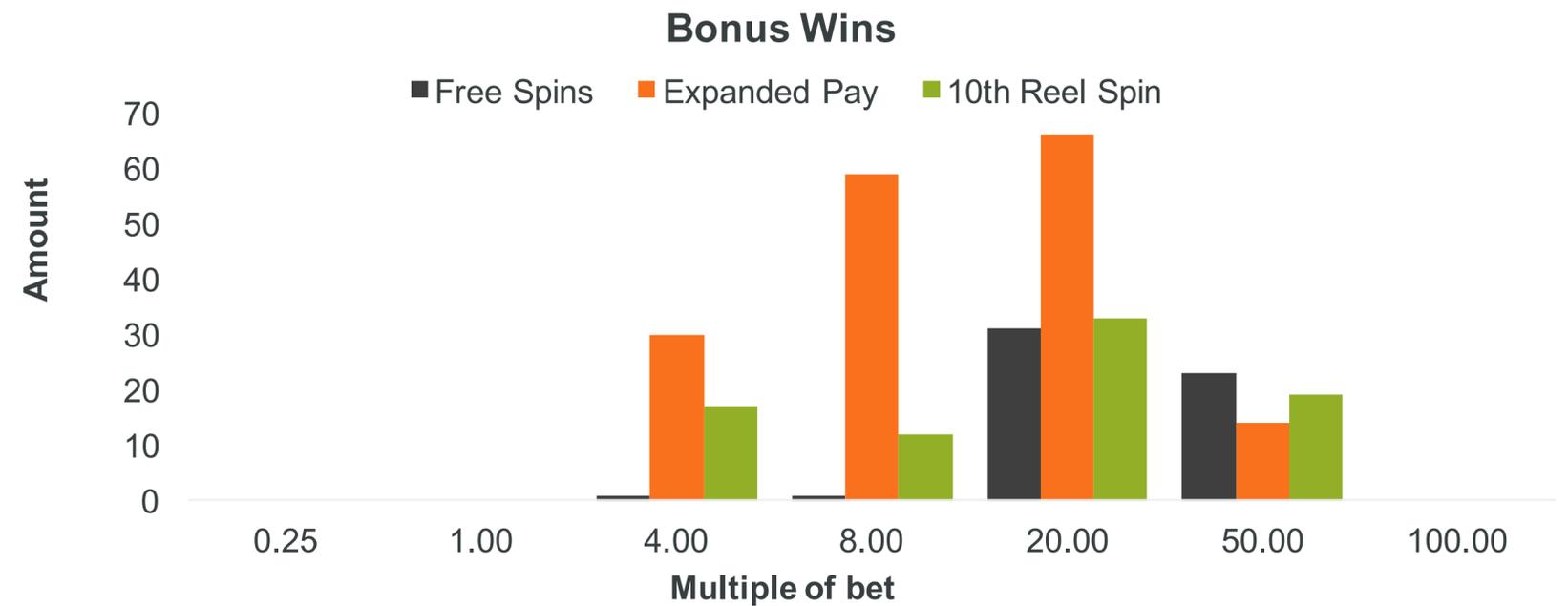
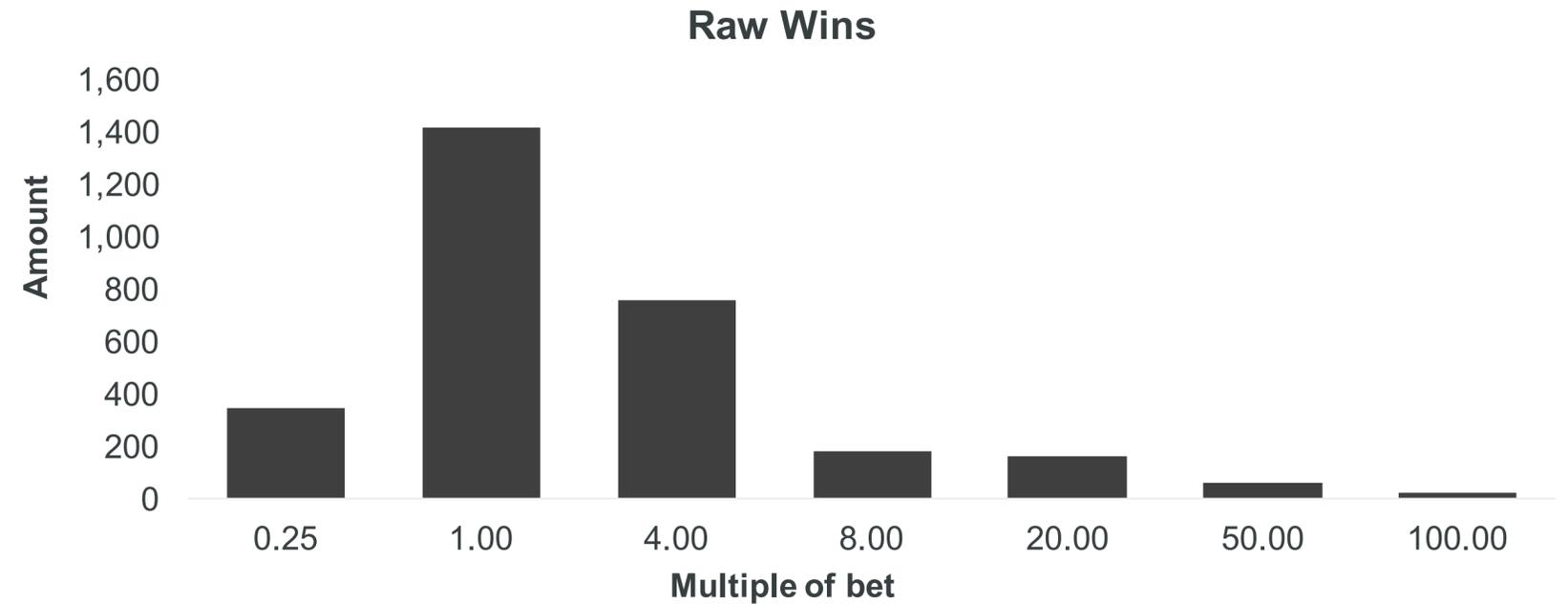
Hit frequency	29%
Volatility	8.0
Spins until a bonus	31

Distribution of RTP as % of total RTP

Base game	35%
Bonus games	65%
Free spins	24%
Expanded pay	17%
10 th reel spin	20%

RTP range

Minimum range	82%
Median	95%
Maximum range	108%



APPENDIX

DATA COLLECTION PROCESS

Machine observations are from 10,000 spins and an RMG accepted statistical process to determine 90% confidence levels of a machine's RTP. Recommendations, information and data comes from market research, app intelligence tools and deep analysis of the games

Machine information

- The RTP range is found using a sample of 10,000 spins, which is approximately 20 hours of play.
- To find the RTP range with 90% confidence, the median payout of the 10K spin +/- (standard error) x (z-score for 90% confidence) is calculated.
- The standard error is (standard deviation) / $\sqrt{\text{sample size}}$ and the z-score for 90% confidence is 1.65.
- For example, the median payout for *Zombie Prom* after 10K spins was 103% with a standard deviation of 3.3.
- The standard error is $3.3 / (\sqrt{10,000})$, which equals 3.3%
- The RTP range for *Zombie Prom* is then 103% +/- (1.65 x 3.3%).
- Based on this sample, the result is a 90% confidence that the real RTP of *Zombie Prom* falls between 97% and 109%.

Market research

- Each game is reviewed daily for updates, regardless of whether the game has been updated through the App Store.
- Transaction information comes from the iOS App Store's In-App Purchases tab. These transactions are ranked based on the number of transactions.
- Las Vegas player insights come from online sources, such as the Las Vegas Convention and Visitors Authority and the UNLV Center for Gaming Research.
- Progressive jackpot information comes from online research, specifically from wizardofodds.
- Trending revenue, downloads and package-rank data come from Priori Data, a Liquid and Grit partner.

Immature poets imitate; mature poets steal; bad poets deface what they take, and good poets make it into something better, or at least something different

– T.S. Elliot

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