



# LIQUID AND GRIT

## Social Casino Slots Report

Competitive research and data insights for slots designers

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# INTRODUCTION



Dear Slots Designers,

Henry Ford once said, “Thinking calls for facts; facts are found by digging; but he who has gathered this wealth is well equipped for life.” It is *our* job to do the digging ... and *yours* to do the thinking. This combination will prepare you for business life.

**New Innovations** provides a snapshot into the month’s best new slots mechanics released in the social casino space, including symbols that act as independent reels, non-coin awards, unlocking reel sets and pick’em spin enhancements during the base game. This section keeps you apprised of new features as they are released so that you can react effectively.

The **Deep Dives** provides valuable data on the most inventive machines. FaFaFa Real Casino released *The Romance of Fire & Rain*, a machine with two 8 x 5 reel sets, mega symbols during free spins, a collection mechanic to trigger jackpots and symbols that convert to wilds during free spins. House of Fun’s *Thundering Thor* adopted the latest multiple-reel trend while adding a Slotomania twist (*different collection mechanics on each of the four reel sets*). In October 2016, our Slots Report highlighted the golden reel mechanic. Now, myKONAMI Slots’ *Overflowing Stacks* employs this mechanic ... only instead of triggering jackpots, the golden reels trigger wilds.

Dig. Think. Create.

All the best,

Brett Nowak  
Editor-in-Chief

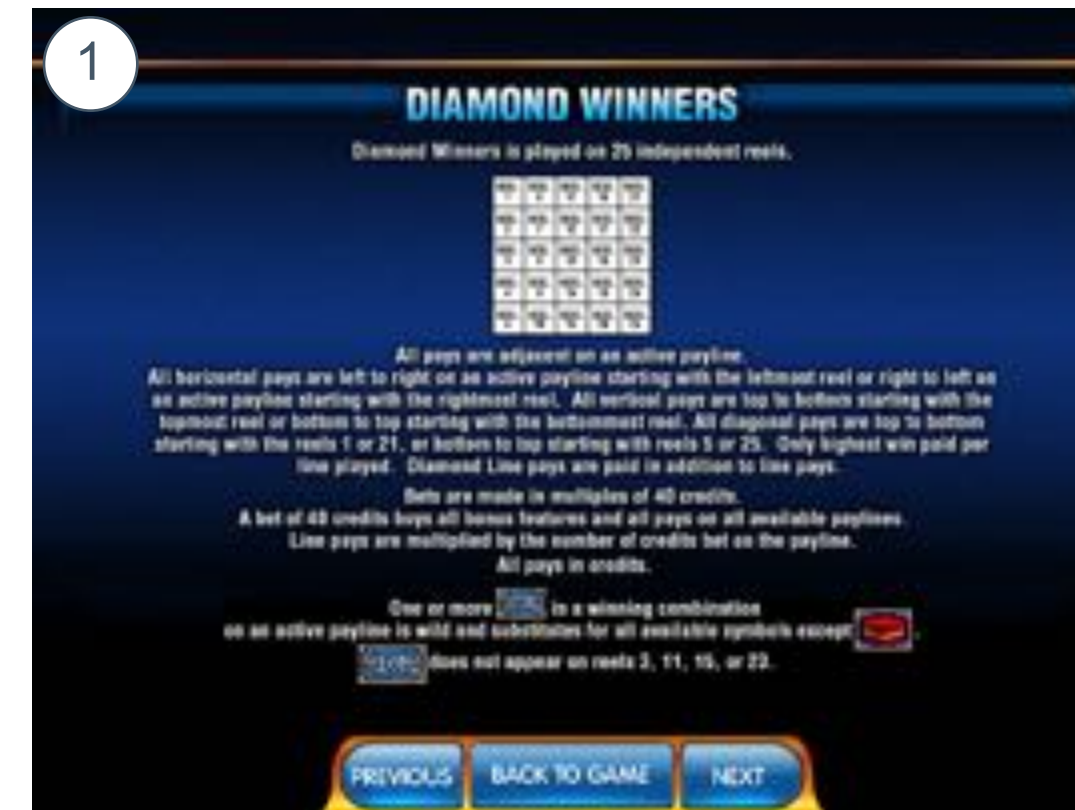
# NEW INNOVATIONS

12/1/16 - 12/31/16

# NEW MECHANICS

Try a machine with symbols that are independent reels. Display only certain reels during spins. Add collection mechanics to multiple reel sets

- **Make each symbol play as separate reels:** In Quick Hit Slots' *Diamond Winners*, all symbols play as independent reels (image 1).
- **Only show certain reels during spins:** In *Diamond Winners*, there is a re-spin feature that triggers with symbols only on the diamond line (reels 3, 11, 15 and 23) (image 2).
- **Consider a pick'em game that adds enhancement spins during the base game:** In Jackpot Party's *Battleship*, players select tiles from the randomly triggered Battle Board feature to add 'spin enhancements' (image 3 & Deep Dives).
- **Add two fill-the-meter mechanics triggered by different symbols:** In Scatter Slots' *Sun & Moon*, players fill up sun and moon meters with day and night symbols (image 4).
- **Have reels compete during free games:** In Heart of Vegas' *The Amazing Race*, players pick a team that corresponds to one of four reel sets. Players win a race bonus if their reel set hits the most 'Express Pass' symbols (image 5).
- **Add collection mechanics to multiple reel sets:** In House of Fun's *Thundering Thor*, players collect different colored gems on each of the four reel sets during free spins (image 6 & Deep Dives).



# NEW MECHANICS CONT.

Add spinner symbols that trigger bonus spins.  
Give non-coin awards during bonus games.  
Add collection mechanics to unlock additional reel sets

- **Add machine spinner symbols that trigger a bonus when a reel fills:** In Slotomania HD's *Power Shot Christmas*, three or more reels fully covered in spinner symbols start a one-line classic slots game (images 1 & 2).
- **Unlock additional reels during bonus with a collection mechanic:** In Caesars Casino's *More Santa!*, players collect 10 golden Santa reel symbols to unlock the top two reel sets (images 3 & 4).
- **Offer non-coin awards during bonus:** In Bingo Blitz's *Jackpot Blitz*, players may win credits, daubs, power ups and other currencies (image 5).
- **Add bonus win symbols to the bottom row of symbols:** In Infinity Slots' *Secret Santa*, during base game and free spins the bottom row symbols are bonuses: more free spins, extra wilds, respins and random amounts of coins. During free spins, the symbols hit more frequently (image 6).



# MARKET WATCH

12/1/16 - 12/31/16

# TRENDS: TOP 30 GROSSING SLOTS GAMES

Colossal reels (3%) and classic 2 x 3 and 3 x 3 reels (10%) were popular in December. Nearly one-third (28%) of machines released were Christmas-themed. More IP released this month. Re-spins (11%) and u-pick the bonus (8%) were trending mechanics

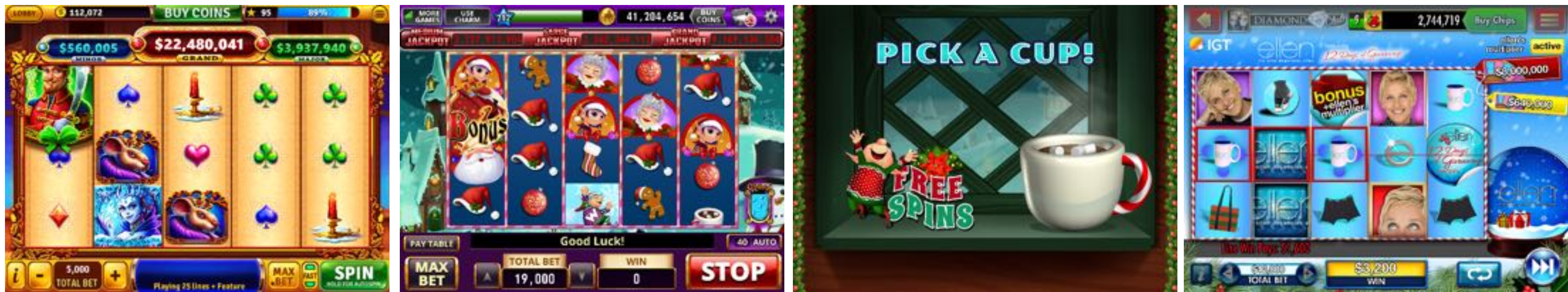


REELS		THEMES		MECHANICS*		IP	
3 x 5	44%	Christmas	28%	Stacked symbols	25%	Ellen	DoubleDown
4 x 5	20%	IP	19%	Multipliers	16%	The Amazing Race	Heart of Vegas
2 x 3	7%	Other	15%	Re-spins	11%	Battleship	Jackpot Party
3 x 3	3%	Classic	9%	Pick'em bonus w/ free spins	9%	Marilyn Monroe	Hit It Rich!
Colossal	3%	Animal, Asian	4%	U-pick the bonus	8%	Cheers and Beers	Hot Shot Casino

\*45% of machines had progressive jackpots; 41% had free spins

# TRENDS: FEATURED GAMES

71% of machines released by featured games were standard reel sets of 3 x 5 and 4 x 5. Featured games released a higher percentage of Christmas-themed machines. Trending mechanics included: U-pick the bonus (18%), non-progressive jackpots (14%) and pick'em bonus with free spins (14%)\*



REELS		THEMES		MECHANICS**		IP	
3 x 5	46%	Christmas	38%	U-pick the bonus	18%	Ellen	DoubleDown
4 x 5	25%	IP	23%	Jackpot(s)***	14%	The Amazing Race	Heart of Vegas
4 x 6	7%	Classic	12%	Multipliers	14%	Marilyn Monroe	Hit It Rich!
5 x 5	7%	Other	12%	Pick'em bonus w/free spins	14%	Cheers and Beers	Hot Shot Casino

\*Featured games include: DoubleDown Casino, Heart of Vegas, House of Fun, Slotomania HD, Hit It Rich!, Caesars Casino, Quick Hit Slots and Hot Shot Casino

\*\*61% of machines have free spins; 54% have progressive jackpots

\*\*\*These are non-progressive jackpots

# DETAILS: FEATURED GAMES

GAME	MACHINE	REELS	LINES	THEME	TYPE	NOTABLE FEATURES
DoubleDown Casino	<i>Spirit of Christmas</i>	3 x 5	20	Christmas	Core Video	U-pick bonus game from three different free spins. <u>Each free spin has a pick'em bonus to either continue picking or collect the free spin winnings</u> (image 1)
	<i>Ellen: 12 Days of Giveaways</i>	3 x 5	30	IP	Premium	Know or Go bonus game where <u>players choose buttons that reward boosts/credits or eliminate 1 of 3 contestants</u> . Three eliminations ends the bonus round (image 2)
	<i>Lobster Mania 2 1024 Ways</i>	4 x 5	1024 ways	IP	Premium	Multiple jackpots, 1024 ways to win, free spins, multiplier symbols and choose a bonus game from three options (image 3)
Heart of Vegas	<i>The Amazing Race</i>	3 x 5	25	IP	Premium	<u>Race feature with a u-pick team for free games played on 4 reel sets</u> , extra wilds and collection feature to win all accumulated race bonuses (image 4)
	<i>Jaguar Mist</i>	4 x 5	Other	Animal	Core Video	Free spins with multiplier symbols and additional free spin symbols



# DETAILS: FEATURED GAMES

GAME	MACHINE	REELS	LINES	THEME	TYPE	NOTABLE FEATURES
House of Fun	Thundering Thor	4 x 6	50	Mythology	Premium	Free games feature with 4 reel sets and progressive jackpot pick'em bonus (image 1 & Deep Dives)
	Ho Ho Ho	4 x 6	80	Christmas	Core Video	Stacked symbols, free spins with locking wilds and fill meter to multiply credits in a pick'em bonus game
	Nutcracker	3 x 5	25	Fictional	Core Video	Win up to 40 free spins on expanded 6 x 5 reel set from a base game reel set of 3 x 5 (image 2)
	Scrooge's Fortunes	5 x 5	50	Christmas	Core Video	Fill meter to move players along a map for a chance to win a progressive jackpot
	Electrified	3 x 5	25	Classic	Core Video	Classic core video machine with pick'em bonus that awards free games multipliers, more free games and coins (image 3)
Slotomania HD	Tiki Spins	3 x 5	25	Other	Premium	Sticky streak re-spin feature where winning combinations initiate re-spins until no new wins occur (image 4)
	Elves INC.	4 x 5	50	Christmas	Core Video	Pick'em bonus game to add extra spins and up to 4 reel sets to free spins awarded (see Deep Dives)



# DETAILS: FEATURED GAMES

GAME	MACHINE	REELS	LINES	THEME	TYPE	NOTABLE FEATURES
Hit It Rich!	<i>Santa's List</i>	4 x 5	40	Christmas	Premium	Expanding wilds and <u>collection mechanic</u> that when completed turns that reel into a wild for the remainder of the free spins (image 1)
	<i>Super Magnificent 777</i>	2 x 3	1	Classic	Classic	<u>2 x 3 machine with bars, 7s and lightning 7 symbols</u> (see Deep Dives)
	<i>Pee-wee's Playhouse</i>	3 x 5	243 Ways	IP	Premium	U-pick for a progression through a pick'em bonus game with 'win all' options available (image 2)
	<i>Marilyn Monroe</i>	4 x 5	40	IP	Premium	Diamonds in the base game trigger a u-pick for free spins or pick'em bonus. In free spins, pink gems that land on reels initiates an on-the-reel pick'em game
	<i>Willy Wonka &amp; The Chocolate Factory: Imagination Room</i>	Locked	Locked	Locked	Locked	Locked
Caesars Casino	<i>Evergreen Gifts</i>	5 x 6	80	Christmas	Core Video	<u>Gifting wilds turn other symbols around it wild and overlapping gifting wilds create x2 or x3 multipliers</u> (image 3)
	<i>Power Shot Christmas</i>	3 x 5	40	Christmas	Core Video	<u>Bonus awards spins in a 3 x 3 mini game.</u> For each triggering symbol, there is a chance to win a progressive jackpot (see New Innovations)
	<i>More Santa!</i>	3 x 5	40	Christmas	Core Video	<u>Free spins turns single reel set into four reel sets.</u> <u>Reel sets are unlocked during free spins with collection mechanic</u> (see New Innovations)
	<i>Christmas is Coming</i>	3 x 5	80	Christmas	Core Video	<u>Bonus game fills in collection mechanic</u> that results in a jackpot when full (image 4)



# DETAILS: FEATURED GAMES

GAME	MACHINE	REELS	LINES	THEME	TYPE	NOTABLE FEATURES
Quick Hit Slots	<i>Fu Dao Le</i>	3 x 5	243 Ways	Asian	Core Video	Full stack of wilds on reel 3 triggers a <u>Jackpot Bonus Feature</u> ; a pick'em game that can trigger a jackpot bonus game (image 1)
	<i>Majestic Stag</i>	3 x 5	50	Fantasy	Core Video	Free games with 10 free spins and up to 100x total bets are awarded
	<i>Riches of the Kings</i>	3 x 5	50	Other	Core Video	Free spins with pick'em feature that awards free games (image 2)
	<i>Diamond Winners</i>	5 x 5	24	Classic	Core Video	<u>Symbols that act as 25 independent reels and diamond shaped pay lines</u> (see New Innovations)
Hot Shot Casino	<i>Chimney Stacks</i>	4 x 5	40	Other	Core Video	Stacked wilds free games that includes stacks of wild symbols on reels 2, 3, 4 and 5
	<i>Colossal Wonderland</i>	Colossal	100	Christmas	Premium	4 x 5 main reel and 12 x 5 colossal reel. <u>During free spins, any wild symbols on main reel expand to full wilds that nudge to colossal reels</u> (image 3)
	<i>Cheers and Beers</i>	4 x 5	50	IP	Premium	Expanding wilds and free spins with spinning wilds. <u>The direction the bottle points is where the wilds are added</u> (image 4)

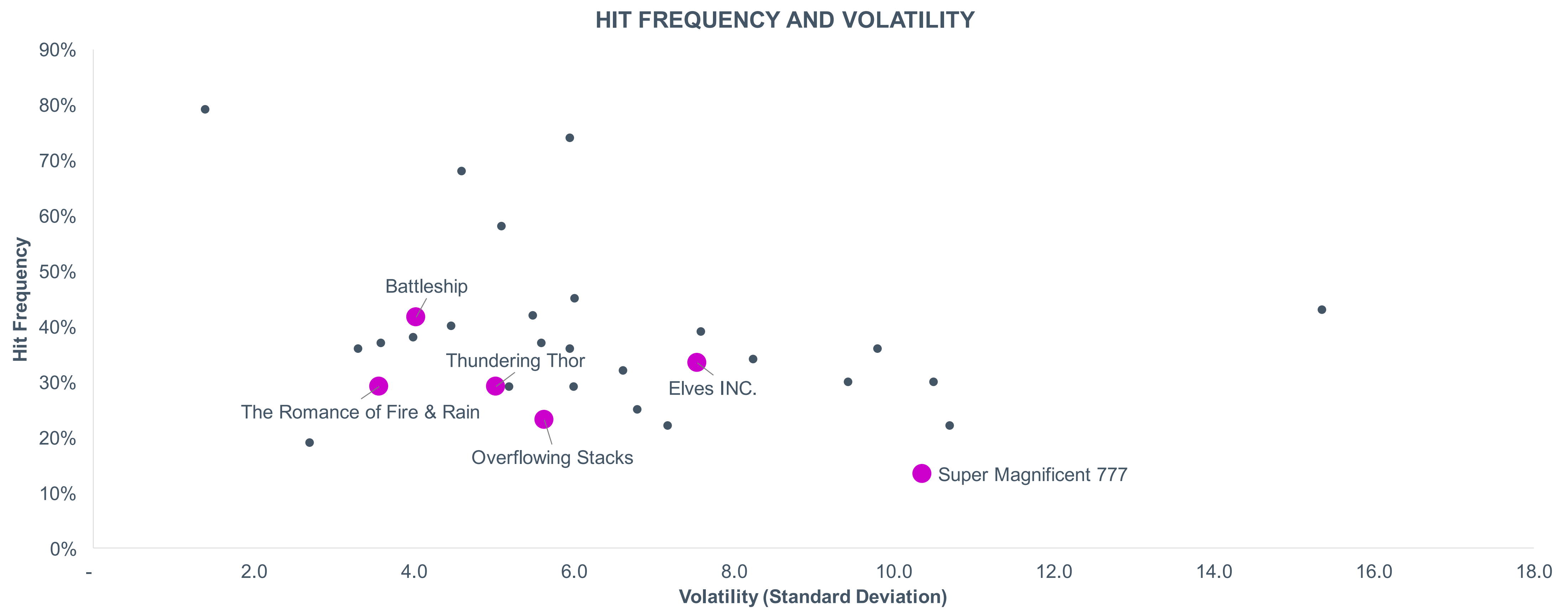


# DEEP DIVES

- *Overflowing Stacks* – myKONAMI Slots
- *The Romance of Fire & Rain* – FaFaFa Real Casino
- *Thundering Thor* – House of Fun
- *Super Magnificent 777* – Hit It Rich!
- *Battleship* – Jackpot Party
- *Elves INC.* – Slotomania HD

# HIT FREQUENCY AND VOLATILITY

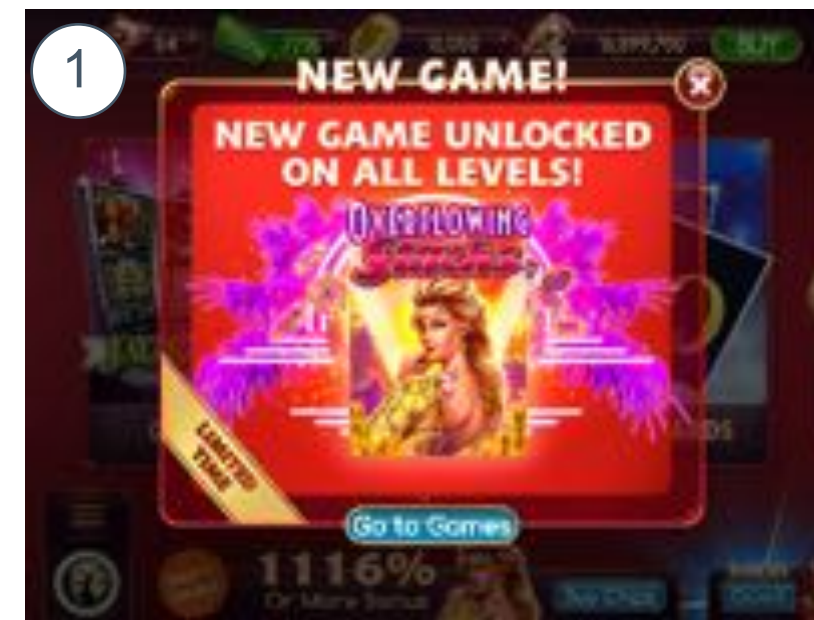
Hit It Rich!’s classic machine, *Super Magnificent 777*, has a very high volatility and low hit frequency (as well as very infrequent bonus games). The rest of the examined machines play similarly to the normal hit frequency and volatility metrics



# OVERFLOWING STACKS

myKONAMI Slots' *Overflowing Stacks* has the golden background mechanic with nudging and swapping wilds

- *Overflowing Stacks* was initially released to all levels and later released with a progressive jackpot (images 1 & 2).
- At machine-entry, a notification appears stating that the current bet does not qualify for the progressive jackpot with the betting options open. This is the same experience on all machines (image 3).
- *Overflowing Stacks* is a 3 x 5 machine with 30 lines. Each reel contains a number of adjacent positions that are randomly replaced with jewel symbols (diamond spade, red cherries, etc.) (image 4).
- The *Lady Luck Transformation* feature is triggered when two or more full stacks of golden backgrounds appear on the reels. While triggered, any symbols appearing with a golden background are replaced with wilds (image 5).
- Three or more bonus symbols that land on the reels trigger 12 to 25 free games (image 6).
- During free games, any partial golden backgrounds are nudged to full golden backgrounds (image 7).
- Additional free games may be won with three or more bonus symbols. Any bonus symbols that appear with a golden background turn into three bonus symbols. These pay out 3x the original bonus symbol (image 8).

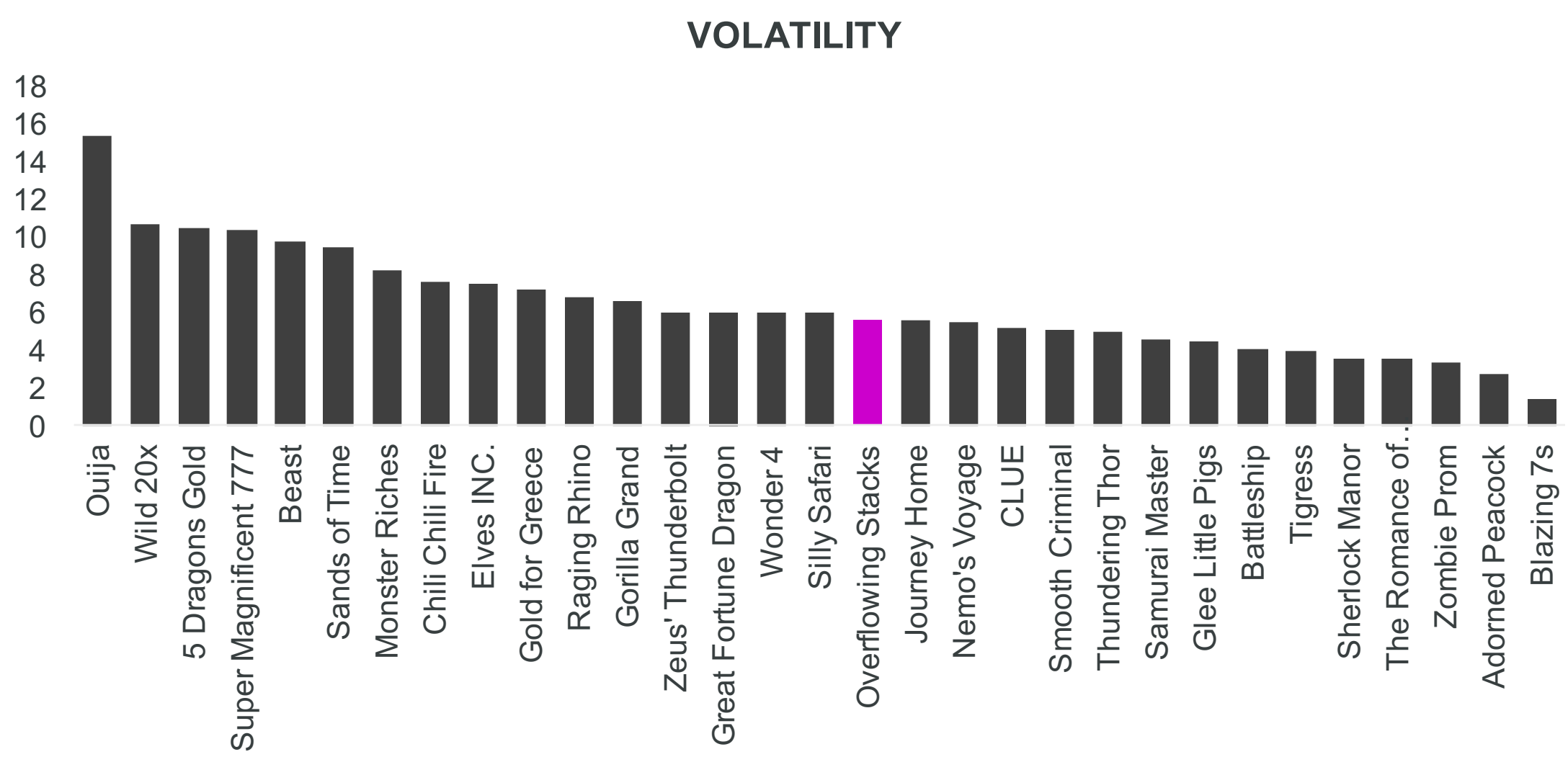
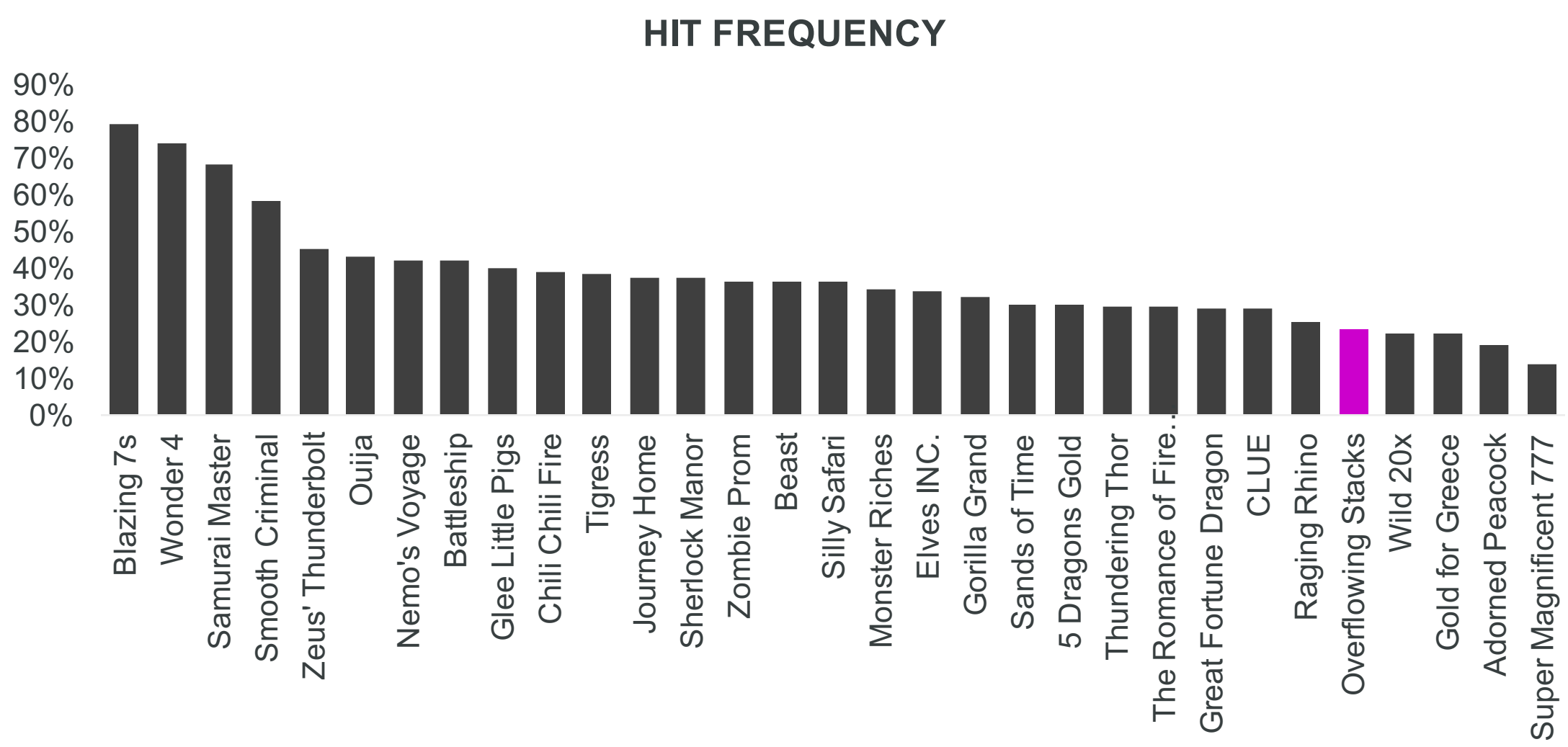


# OVERFLOWING STACKS STATS

myKONAMI Slots’ *Overflowing Stacks* has a low hit frequency, frequent bonus games and low RTP. 78% of RTP is paid out in the bonus

Game play*	
Hit frequency	23%
Volatility	5.6
Spins until a bonus	21
Distribution of RTP as % of total RTP**	
Base game	22%
Bonus game	78%
Free games	32%
Transformation feature	46%
RTP range***	
Minimum range	62%
Median	71%
Maximum range	80%

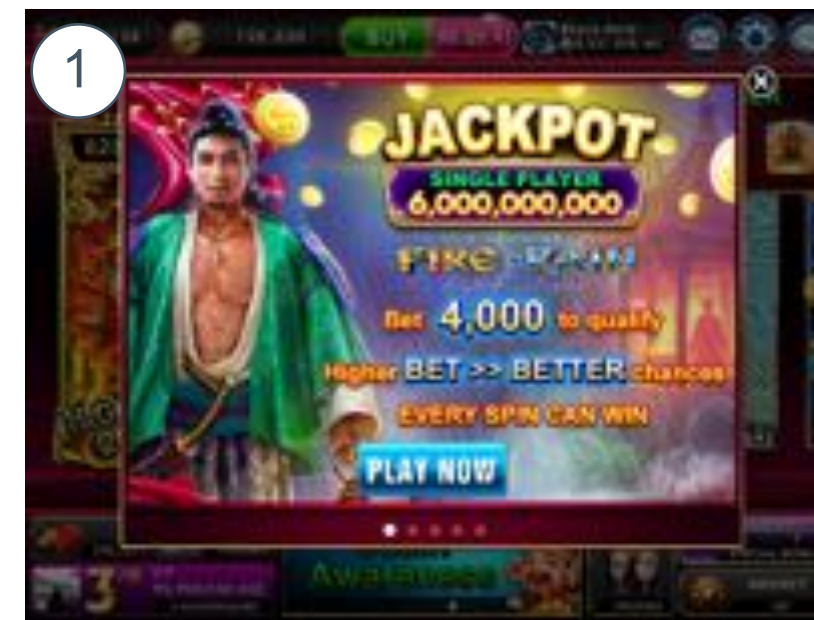
\*Volatility is based on the standard deviation of the 10,000 payouts from this machine  
\*\*The distribution of RTP equals the RTP of the base or bonus game over the total RTP  
\*\*\*90% confidence with 10,000 spins of this machine. More info on this process in the Appendix



# THE ROMANCE OF FIRE & RAIN

FaFaFa Real Casino's *The Romance of Fire & Rain* has two large reel sets with mega symbols, free games, matching wilds and a jackpot collection feature

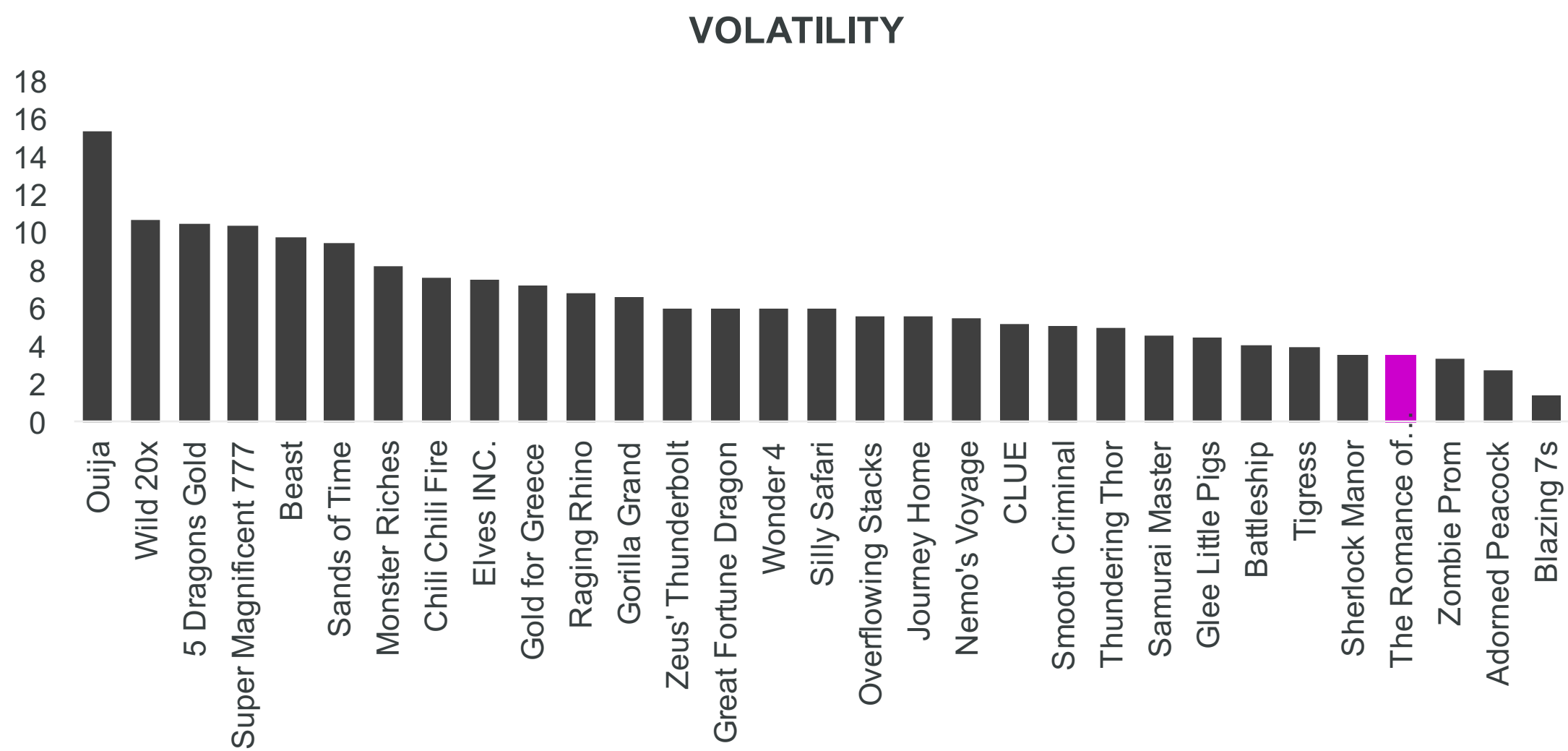
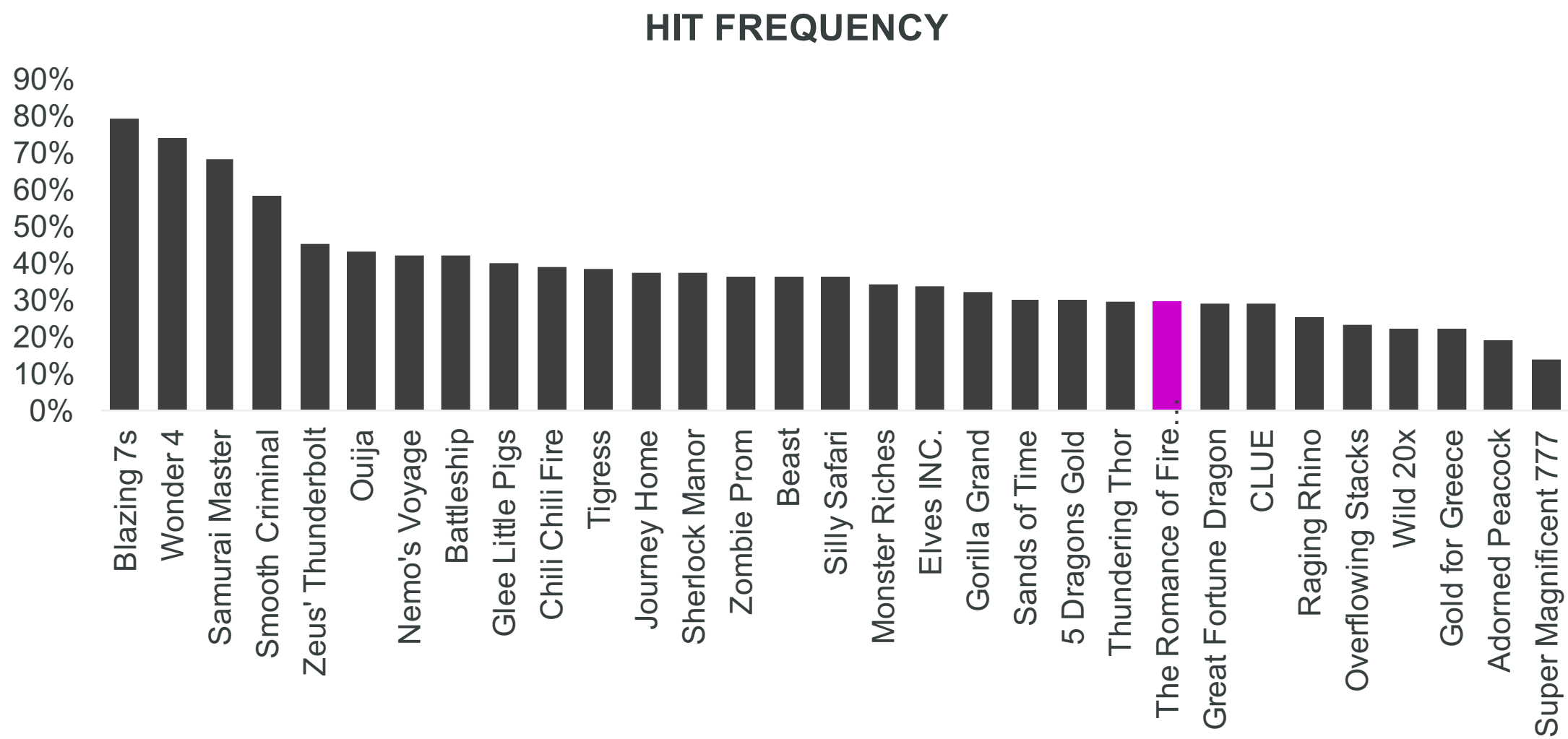
- Upon game-entry, a dialogue box details the jackpot and bet level information for this new machine (image 1).
- Clicking *Play Now* takes players to a 'choose your bet' dialogue box with an overview of machine features (image 2).
- In the machine, there are five levels of jackpots displayed above two 8 x 5 reel sets (image 3).
- During any spin, matching picture symbols that appear in the same position on each reel set change into wilds (image 4).
- Jackpot symbols appear randomly during play on both reel sets. Collecting five or more jackpot symbols in one spin will fill the jackpot meter, which is located vertically between the reel sets (image 5).
- When enough symbols have been collected to award a jackpot prize, a notification appears. In this case, a *Major Jackpot!* was awarded (image 6).
- When two full mega bonus symbols land in each reel set during base game play, 15 free games are awarded (image 7).
- After completion of free games, the amount of coins won is displayed (image 8).



# THE ROMANCE OF FIRE & RAIN STATS

FaFaFa Real Casino’s *The Romance of Fire & Rain* has a very low volatility with most of the RTP paid out in the base game. RTP range is low

Game play	
Hit frequency	29%
Volatility	3.6
Spins until a bonus	81
Distribution of RTP as % of total RTP	
Base game	70%
Bonus game	30%
RTP range	
Minimum range	65%
Median	71%
Maximum range	77%



# THUNDERING THOR

House of Fun's *Thundering Thor* has a multi-reel collection feature that converts into a pick'em bonus for the opportunity to win a progressive jackpot

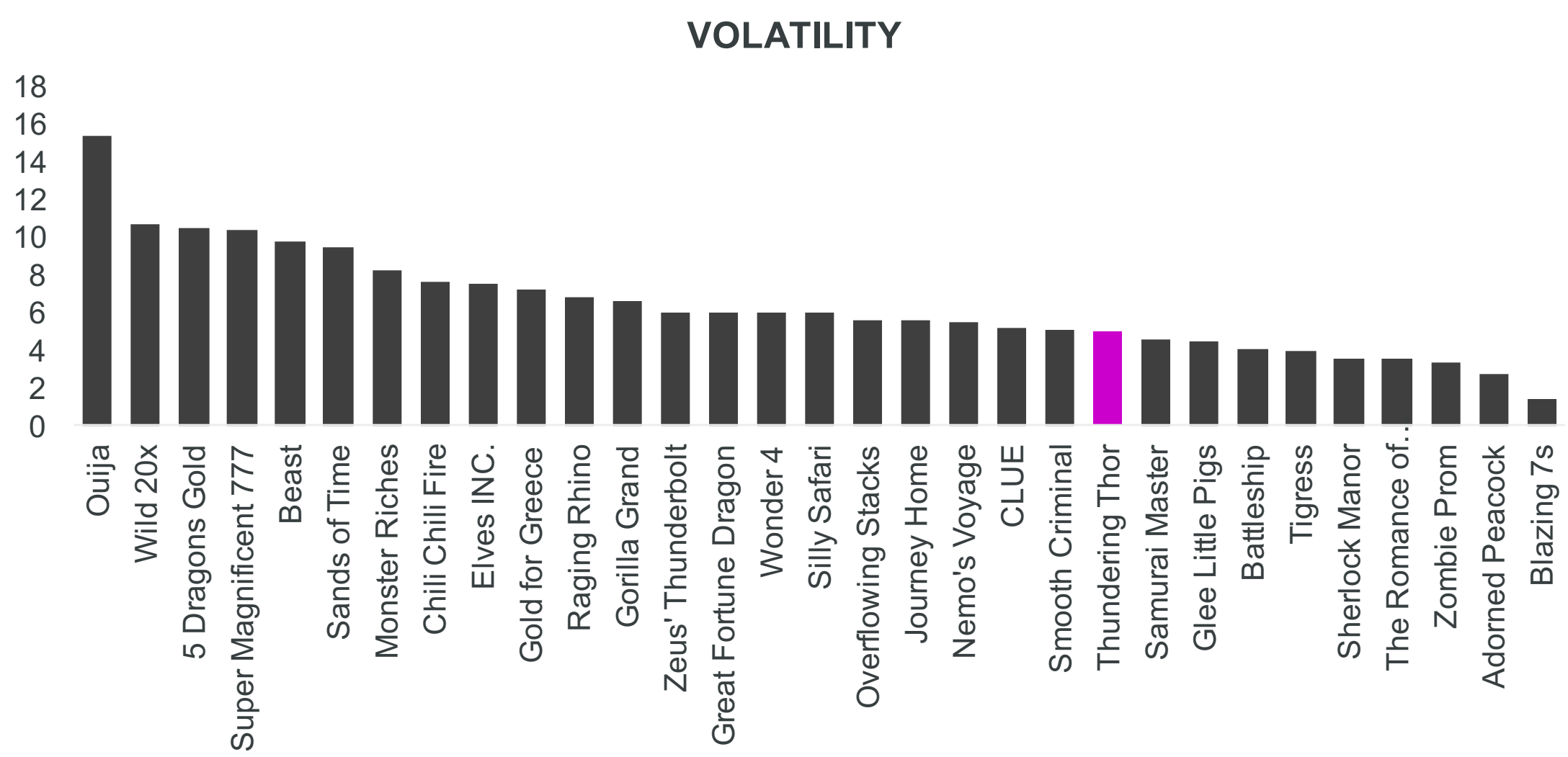
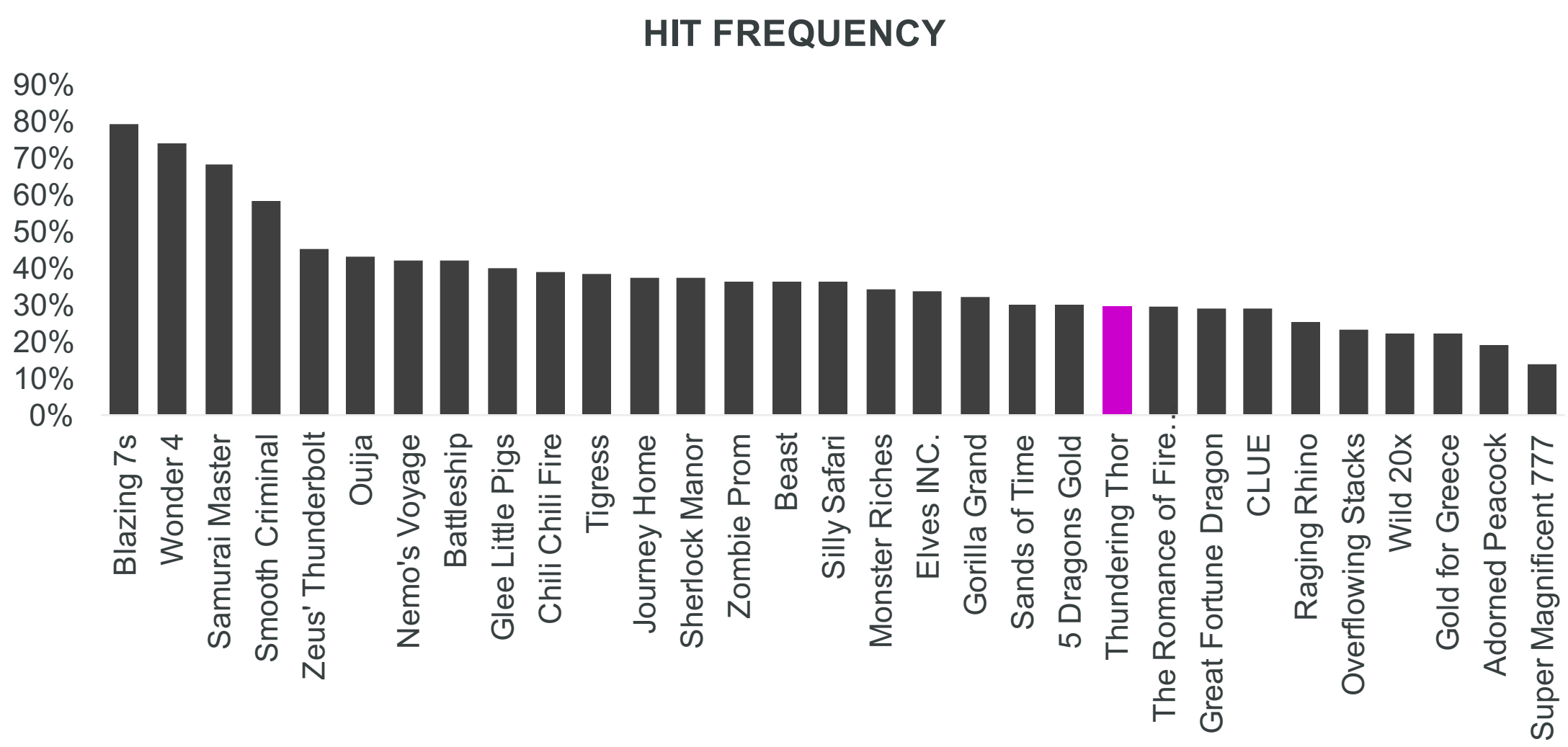
- Upon machine-entry, a dialog box appears with qualifying bets (image 1).
- Four levels of progressive jackpots are displayed above a 4 x 6 reel set. Any spin can trigger the *Thundering Wilds* feature that turns non-wild symbols that land between two wilds into wilds (image 2).
- Free games are triggered when three or more bonus symbols appear on the reels. Players are awarded 10 free games when three bonus symbols hit and up to 50 free games when six bonus symbols hit (image 3).
- During free games, the entire reel 6 remains wild and the *Thundering Wilds* feature is active. Additional free games may be won by hitting three or more bonus symbols (image 4).
- The *Living the Dream Progressive Bonus* is triggered when the progressive jewel lands anywhere on reel 6 during base game play (image 5).
- The *Living the Dream Progressive Bonus* awards players 10 free games on four 3 x 5 reel sets (image 6).
- On these four reels, players collect five jewels that appear on the four different reel sets (image 7).
- Collecting five jewels triggers a pick'em bonus game. Prizes awarded in the bonus game are coins, pick again, additional free games and the progressive jackpot (image 8).



# THUNDERING THOR STATS

House of Fun’s *Thundering Thor* has infrequent bonus game hits and slightly below average hit frequency and volatility

Game play	
Hit frequency	29%
Volatility	5.0
Spins until a bonus	105
Distribution of RTP as % of total RTP	
Base game	62%
Bonus game	38%
RTP range	
Minimum range	87%
Median	95%
Maximum range	103%



# SUPER MAGNIFICENT 777

Hit It Rich!'s *Super Magnificent 777* is a classic style 2 x 3 machine with a progressive jackpot

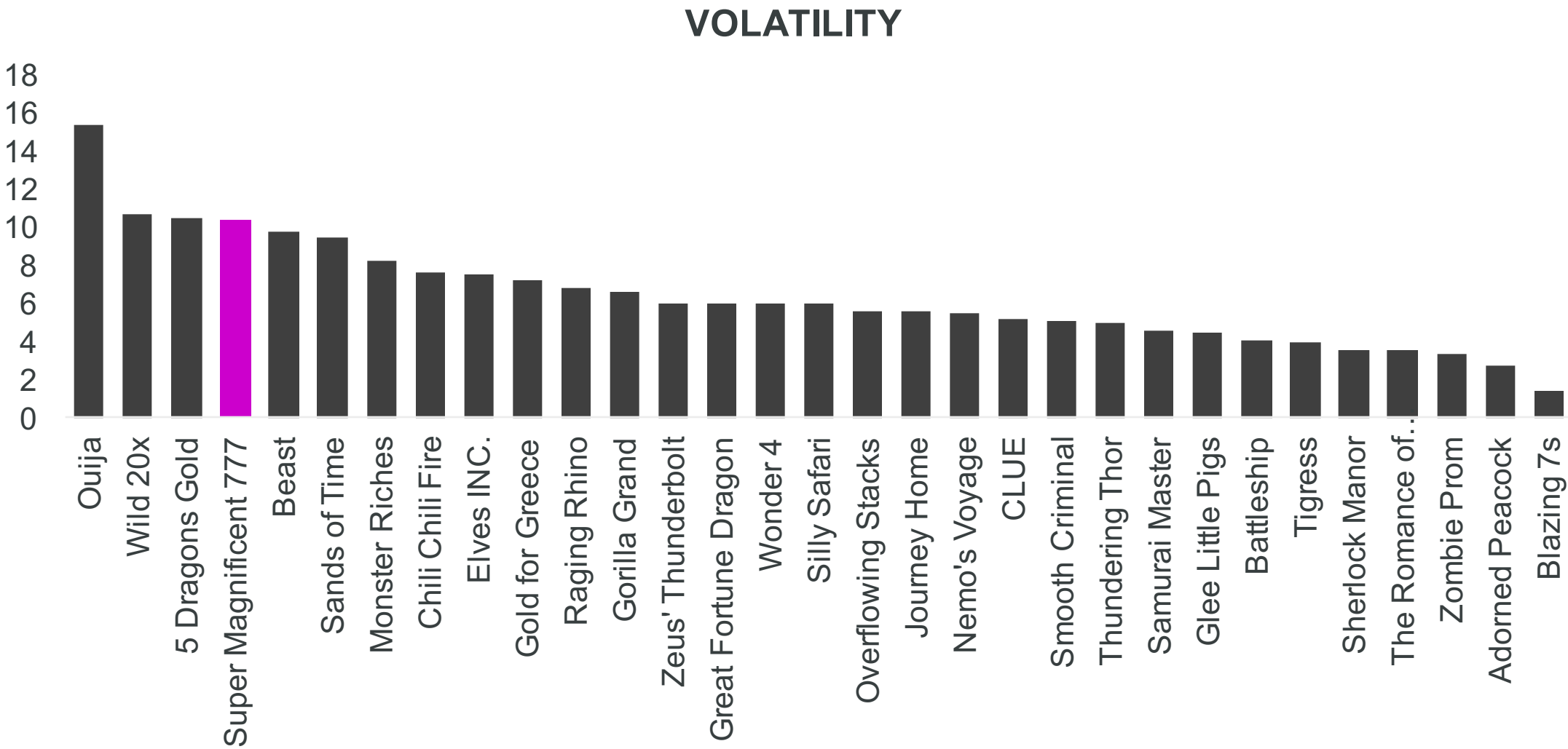
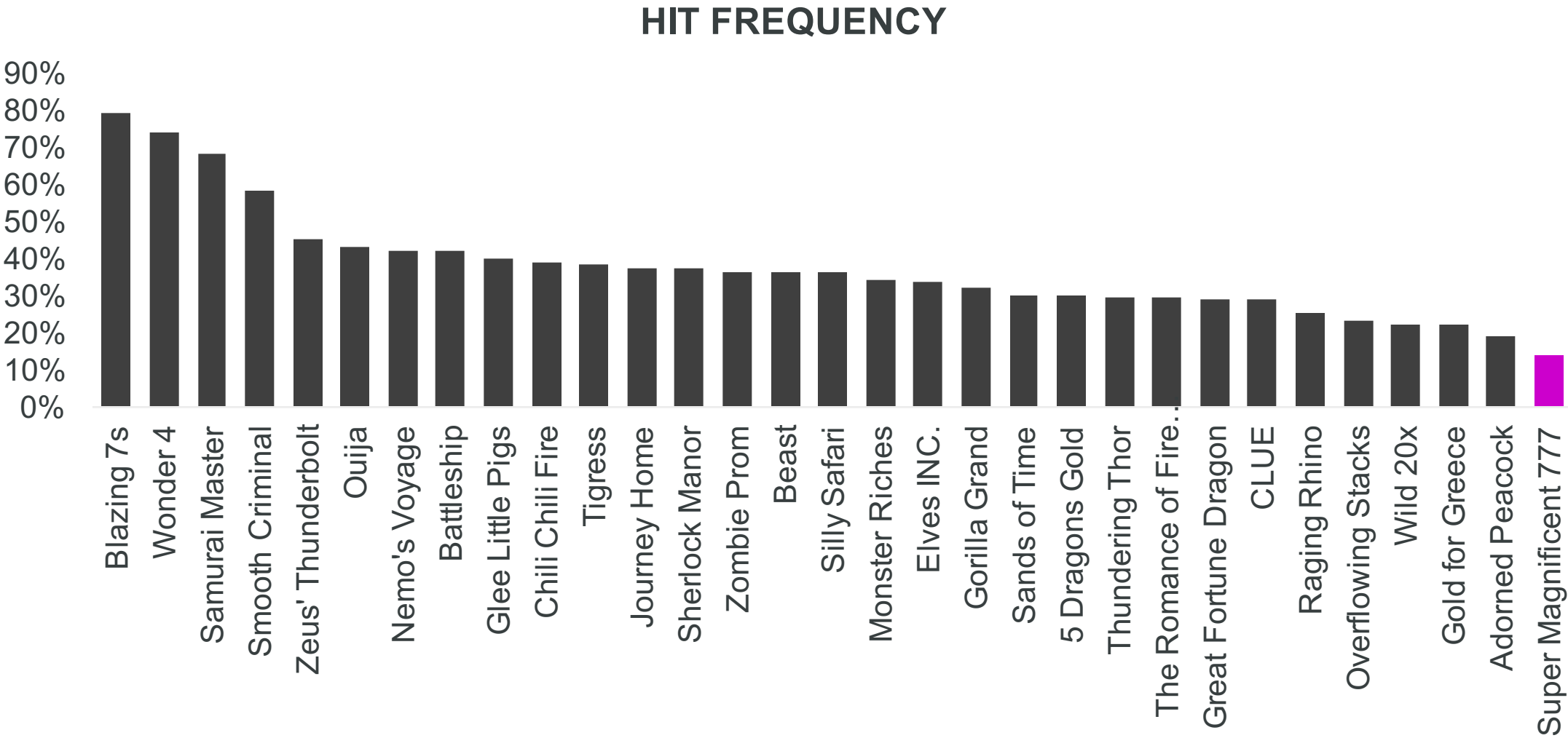
- *Super Magnificent 777* was initially released with early access to only ruby or higher VIP levels (image 1).
- Approximately two weeks later, the machine was released to the main lobby (image 2).
- A 'Choose Initial Bet' dialogue box opens when the machine is selected, outlining the progressive jackpot amount, bet levels and a jackpot guarantee (image 3).
- At the top of the 2 x 3 reel set, a checkmark appears next to the progressive jackpot when an eligible bet is selected. The minimum cost per spin is \$3.54 worth of coins (image 4).
- When no symbols appear anywhere on the pay line, 67% of the initial bet is paid (image 5).
- A progressive jackpot is awarded when three lightning bolt sevens appear on the pay line with an eligible bet (image 6).



# SUPER MAGNIFICENT 777 STATS

Hit It Rich!’s *Super Magnificent 777* bonus game hits once every 5,000 spins, resulting in low hit frequency and high volatility

Game play	
Hit frequency	13%
Volatility	10.4
Spins until a bonus	5,000
Distribution of RTP as % of total RTP	
Base game	88%
Bonus game	12%
RTP range	
Minimum range	68%
Median	85%
Maximum range	102%



# BATTLESHIP

Jackpot Party's *Battleship* has two reel sets, a colossal reel and a pick'em feature that awards spin enhancements

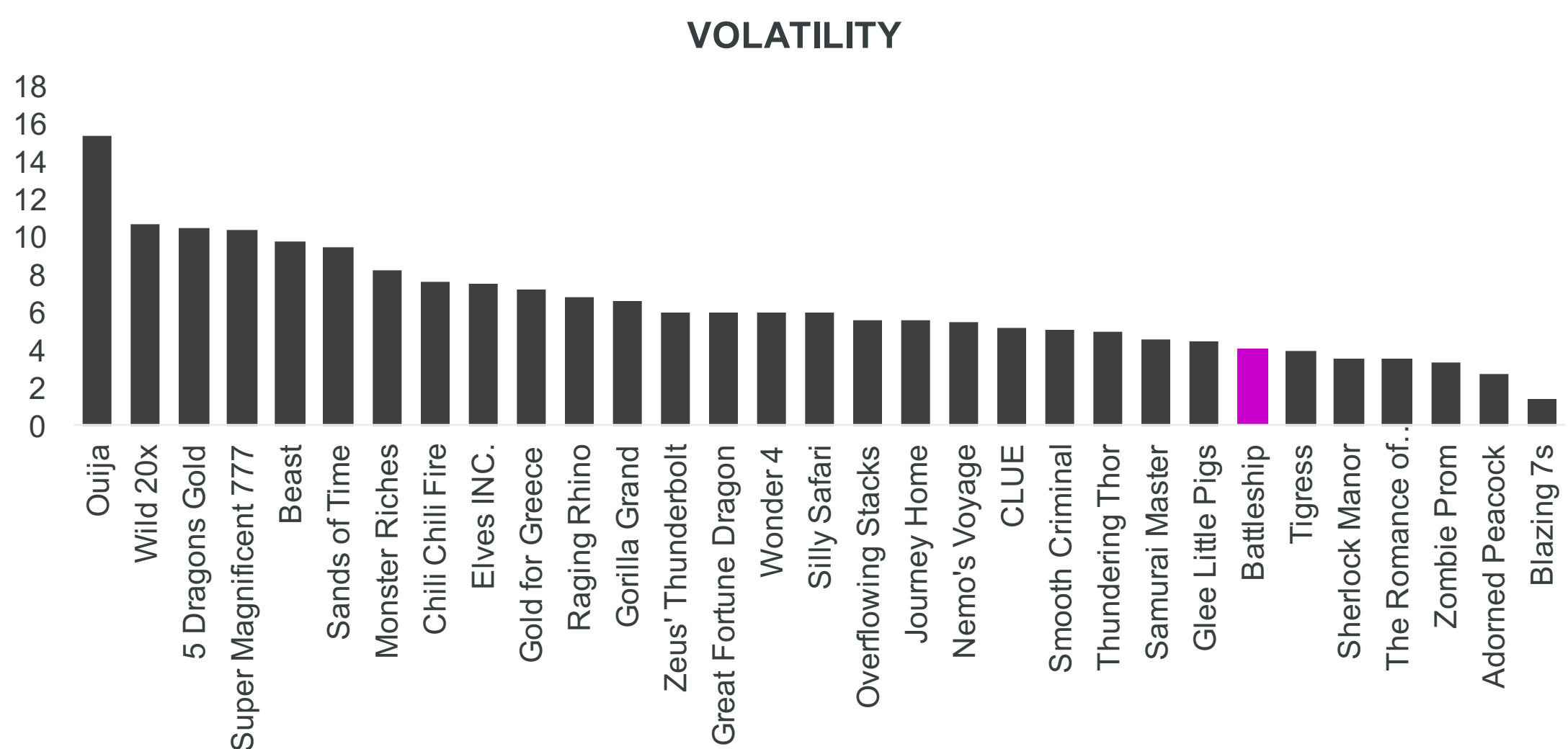
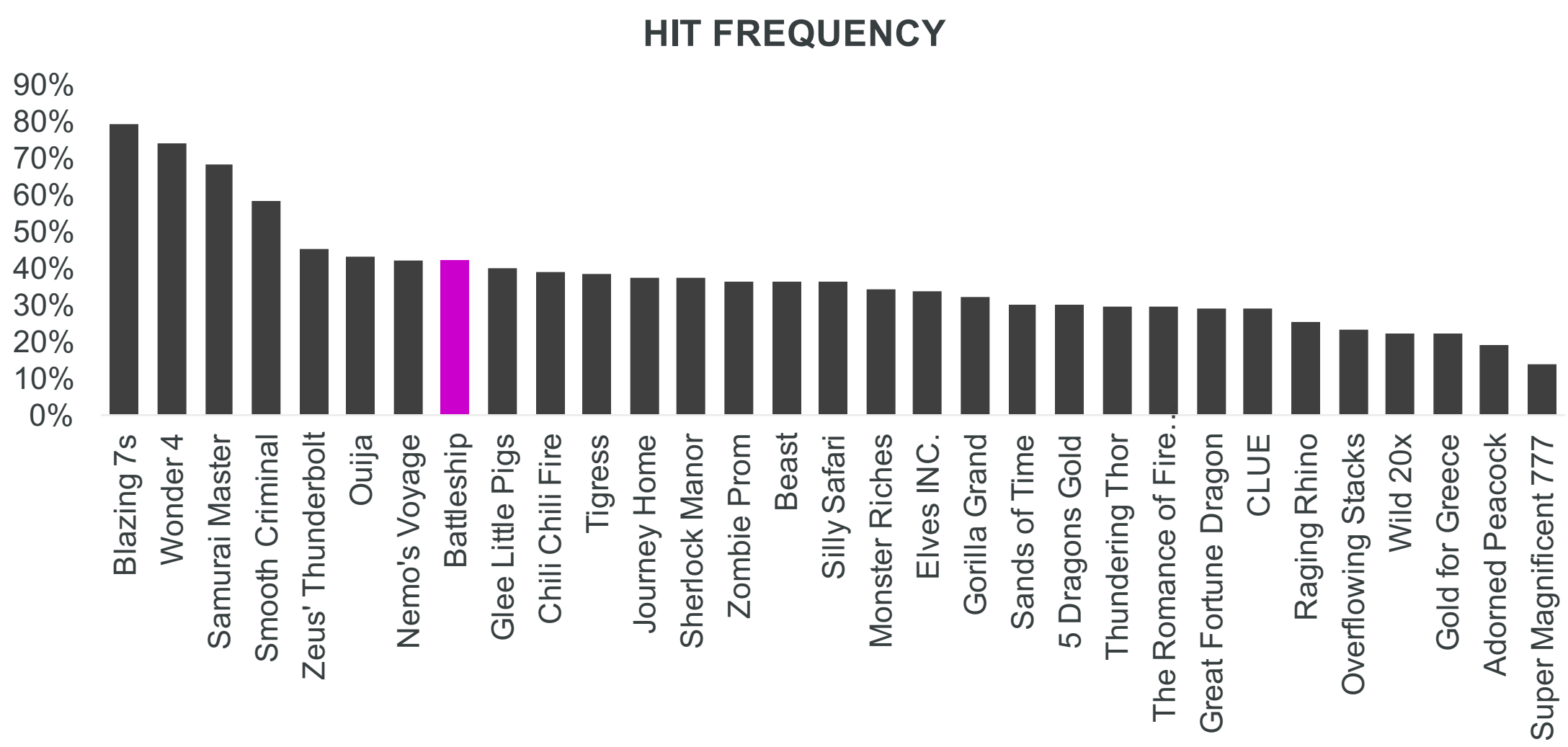
- At machine-entry, a 'Choose A Qualifying Bet' displays the current progressive jackpot, qualifying bet levels and odds of winning bars (image 1).
- The progressive jackpot is displayed above two reel sets: the main 4 x 5, 25 line reel set and the colossal 12 x 5, 75 line reel set. During play, wilds that appear on the main reel set will nudge over to the colossal reel set (image 2).
- A random Battle Board pick'em feature can trigger anytime during base game play. Players pick three times from a mini battleship 4 x 5 board (image 3).
- Each pick awards a spin enhancement that range from additional picks with credits, win multipliers, wild symbols or full reel wilds (image 4).
- To trigger the Battleship Spins Bonus, three or more bonus symbols must land on either of the two reel sets (image 5).
- The Battleship Spins Bonus awards seven free spins and displays four ships above the main reel set. Each ship has empty peg spaces (image 6).
- During free spins, a Fire button symbol or a +1 Spin symbol can appear on reel 5 of either reel set. The Fire symbol shoots a peg at the ships and the +1 Spin symbol awards another free spin (image 7).
- When all the peg spaces on a ship are filled, the ship sinks and notification that 'You sunk my...' appears with the prize amount awarded (in this case \$4M) (image 8).



# BATTLESHIP STATS

Jackpot Party’s *Battleship* has an above average hit frequency with low volatility. Over half of the RTP is paid out in bonus games

Game play	
Hit frequency	42%
Volatility	4.0
Spins until a bonus	26
Distribution of RTP as % of total RTP	
Base game	47%
Bonus game	53%
Free games	24%
Pick'em feature	29%
RTP range	
Minimum range	91%
Median	98%
Maximum range	104%



# ELVES INC.

Slotomania HD's *Elves INC.* has a two-part Santa's Workshop Bonus feature with a pick'em bonus that is followed by multi-reel free spins

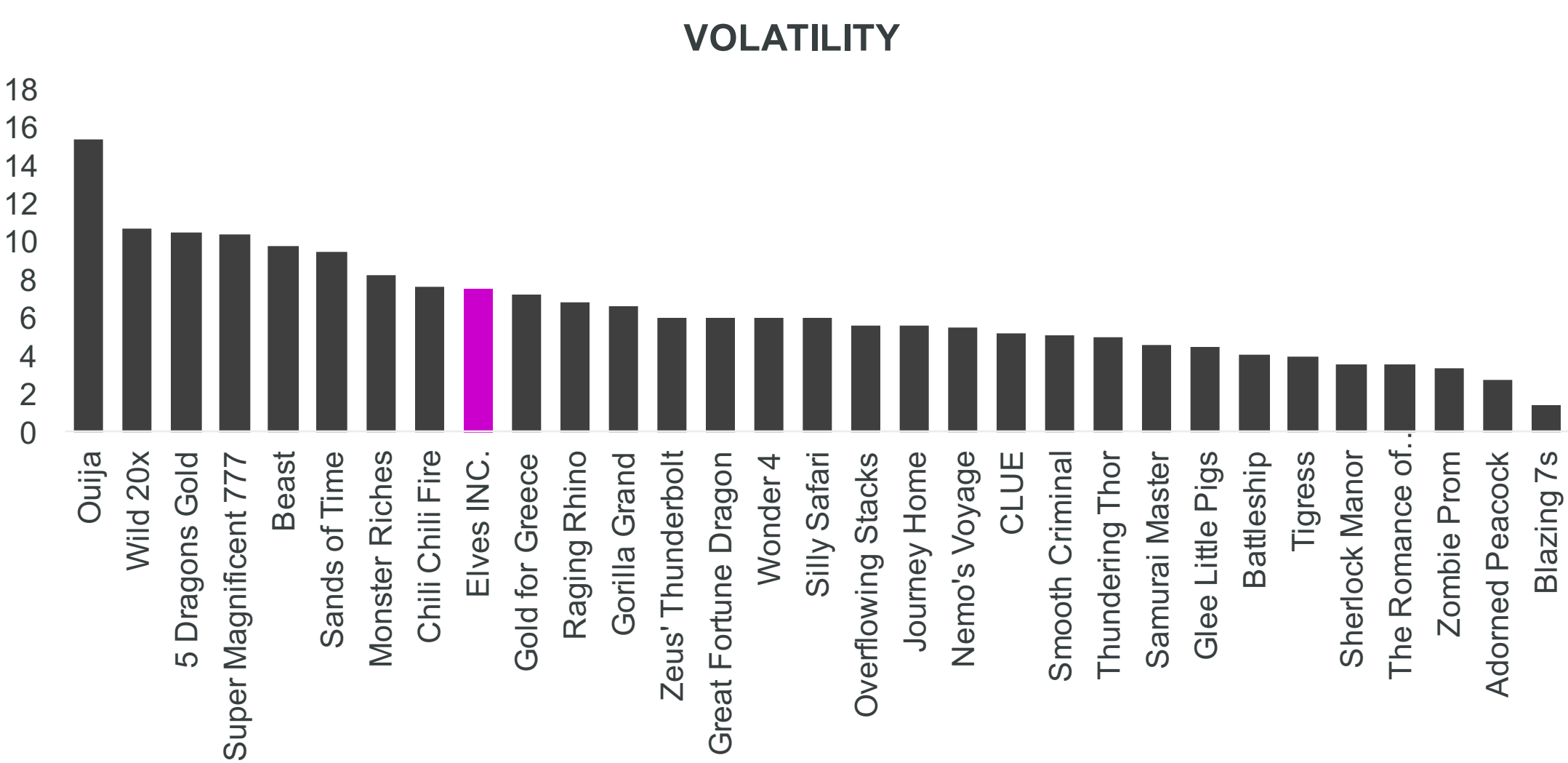
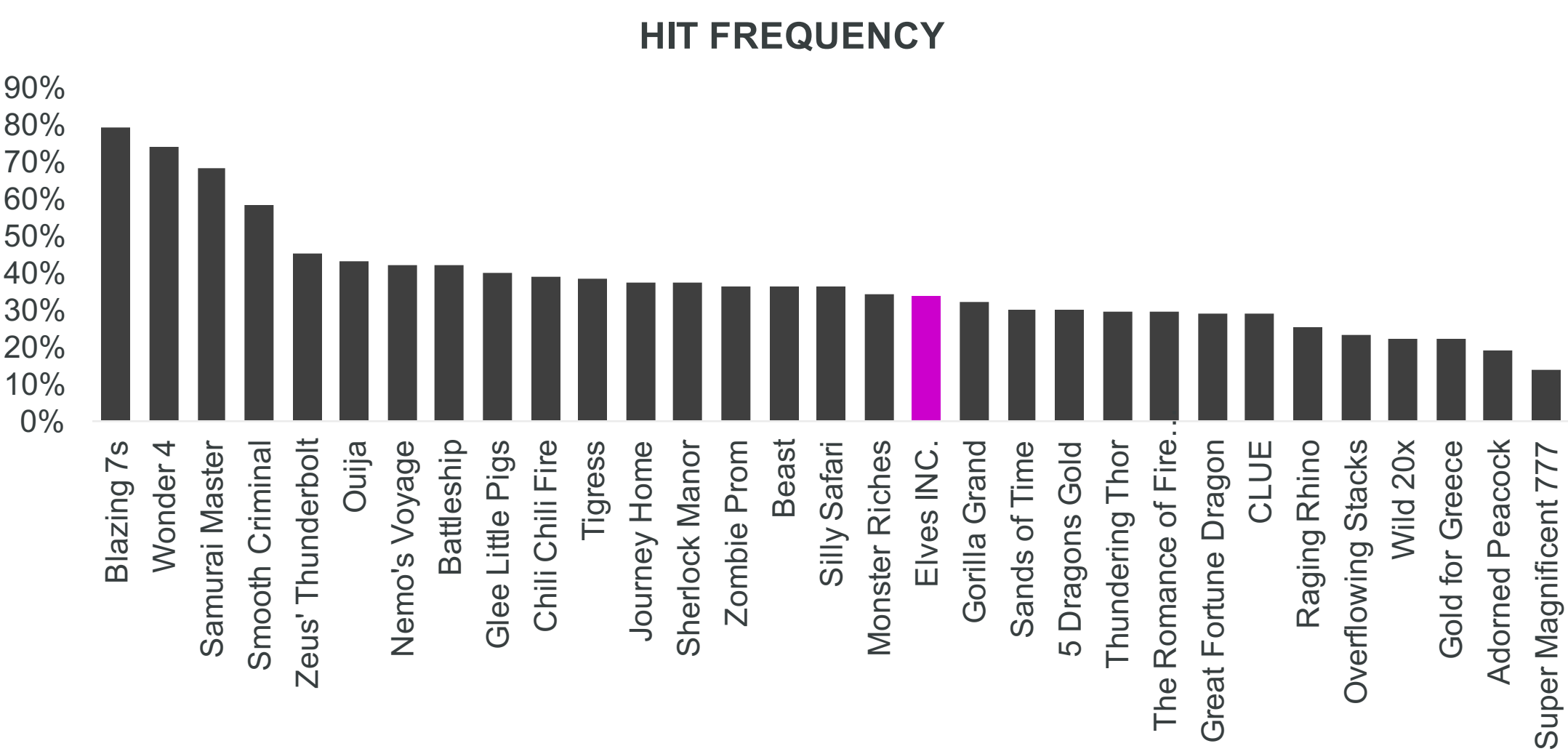
- At app-entry, a dialogue box appears announcing the new machine *Elves INC.* with the text, 'Pick features for amazing wins in multi reel free spins!' (image 1).
- The holiday-themed machine offers a 4 x 5 reel set with 50 lines and stacked symbols (image 2).
- Three or more bonus symbols trigger the Santa's Workshop Bonus (image 3).
- The bonus begins by introducing a machine with 12 gizmos to pick from to reveal bonus features. Three triggering bonus symbols awards five picks, four symbols awards six picks, and five symbols awards seven picks (image 4).
- Players start the pick'em bonus with five free spins, two reel games and one wild reel. Picking various gizmos reveals additional picks, reel games, free spins and wild reels for the free spin portion of the bonus (image 5).
- When the pick'em feature is complete, a notification displays the final tally of spins, reel sets and wild reels awarded (image 6).
- Each reel set (in this case three) and wild reels awarded in the pick'em bonus is played on 4 x 5 reels with 25 lines (image 7).
- A dialogue box appears at the completion of the bonus, displaying the amount of coins won and the option to share free coins with friends (image 8).



# ELVES INC. STATS

Slotomania HD’s *Elves INC.* has an infrequent bonus game but a high percentage of RTP paid out in the bonus game

Game play	
Hit frequency	33%
Volatility	7.5
Spins until a bonus	213
Distribution of RTP as % of total RTP	
Base game	58%
Bonus game	42%
RTP range	
Minimum range	61%
Median	73%
Maximum range	86%



# 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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