



GLI[®]

World Headquarters

600 Airport Road
Lakewood, NJ 08701

Phone (732) 942-3999
Fax (732) 942-0043
www.gaminglabs.com

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26 November 2025

Mr. Bill James, Owner
NB Games LLC
4224 Del Mar Drive
Grandville, Michigan 49418

Re: Mathematical Analysis of *Breakout Blackjack*

File Number: LO-00-NBG-25-02

Dear Mr. James,

As per NB Games LLC's request, please find **Gaming Laboratories International, LLC's (GLI)** math analysis for the table game side bet, *Breakout Blackjack*.

This report only verifies the mathematical aspects of this game and DOES NOT offer an opinion as to whether or not this game is currently authorized for use in any jurisdiction. Requests for a mathematical evaluation for Nevada must be addressed directly to the respective gaming regulatory agency in that jurisdiction.

Game Description

Breakout Blackjack is a set of wagers that can be configured with traditional Blackjack themes that use a 1, 2, 6, or 8 deck shoe. Before the deal, the player instead of wagering on their hand to win, may instead wager on the dealer's hand to win. If the player does this, then their hand is automatically played out in the same manner as the dealer's hand, thus the player has no control over the actions taken on their hand. If the player places this wager, they also have the option of placing a Super Tie, Breakout Bonus, Sweet 17, and/or Pair Up Plus side wager. The dealer's hand will always be played out if a wager is placed on the dealer's hand to win regardless of any other outcomes from the Blackjack theme.

If the main Blackjack theme is configured with a dealer peek for Blackjack, the dealer peek would occur before any action is taken on the player's hand, and if the dealer does have blackjack, then no action is taken on the player's hand. Outside of this instance, the player's and dealer's hands are always played to completion whenever a *Breakout Blackjack* wager is placed to ensure the wager is resolved.

MAIN WAGER

If the dealer's hand has a Blackjack and beats the player's hand, the main wager pays out the same value as a Blackjack win (3 to 2 or 6 to 5) would from the configured Blackjack theme. If the dealer's hand beats the player's hand, the main wager pays out 1 to 1. If both the player's and dealer's hands bust, both the player's and dealer's hand have the same value, or the player's hand busts and the dealer's hand ends with a value of 17 then the main wager pushes. Otherwise, the main wager loses.

SUPER TIE SIDE WAGER

The Super Tie side wager pays out according to [Table 1](#) if both the player's and dealer's hand bust or both hands tie with the same value. Otherwise, the side wager loses. This side wager also includes a dealer tip that is funded by the house and paid to the dealer with any player win. The dealer tip is always constant no matter the player's wager. The minimum wager amount for this side wager is \$5.

Table 1. Super Tie Payouts

Outcome	Pays	Dealer Tip
Player & Dealer Hands Bust	1 to 1	\$1
Player & Dealer Hands Tie with a 17, 18, or 19	3 to 1	\$2
Player & Dealer Hands Tie with a 20	8 to 1	\$3
Player & Dealer Hands Tie with a Non-BJ 21	15 to 1	\$5
Player & Dealer Hands Tie with BJ	25 to 1	\$10

BREAKOUT BONUS SIDE WAGER

The Breakout side wager pays out according to [Table 2](#) if both the player's and dealer's hand bust, with the pays varying based on the total number of cards between the player's and dealer's hands.

Table 2. Breakout Bonus Payouts

Outcome	Pays
6, 7 Cards	5 to 1
8 Cards	15 to 1
9 Cards	30 to 1
10 Cards	100 to 1
11 Cards	150 to 1
12+ Cards	250 to 1

SWEET 17 SIDE WAGER

The Sweet 17 side wager pays out 5 to 1 if the dealer's hand ends with a 17, otherwise the wager loses. The operator can choose to configure this wager to pay 6 to 1 instead of 5 to 1 when the dealer hits on Soft 17.

PAIR UP PLUS SIDE WAGER

The Pair Up Plus side wager is resolved based on the player and/or dealer having a pair in their initial 2-card hand and pays out according to [Table 3](#) if a winning outcome occurs, otherwise the wager loses. Only the highest paying outcome will be awarded. This wager is not available for the 1-deck configuration.

Table 3. Pair Up Plus Payouts

Outcome	Paytable 1	Paytable 2	Paytable 3
Both Have A Suited Pair	N/A	N/A	250 to 1
Both Have A Pair	N/A	50 to 1	150 to 1
Either Have A Suited Pair	8 to 1	5 to 1	N/A
Either Have A Pair	4 to 1	3 to 1	N/A

Mathematical Analysis

The analysis was done by writing a program that iterated through every possible deal when the player's hand is treated in the same manner as the dealer's hand for all deck configurations and accounting for hitting or standing on a soft 17. The probabilities for each non-losing outcome for each wager option are listed in [Table 4](#) through [Table 8](#).

Table 4. Main Wager Probabilities

Hit Soft 17				
Outcome	1 Deck	2 Deck	6 Deck	8 Deck
Dealer Hand BJ Win	0.04649244	0.04578329	0.04532299	0.04526613
Dealer Hand Win	0.32672569	0.32717445	0.32742997	0.32745959
Push	0.21481564	0.21569166	0.21633956	0.21642388
Stand Soft 17				
Outcome	1 Deck	2 Deck	6 Deck	8 Deck
Dealer Hand BJ Win	0.04649244	0.04578329	0.04532299	0.04526613
Dealer Hand Win	0.32447748	0.32488344	0.32511078	0.32513690
Push	0.21651178	0.21745699	0.21815123	0.21824135

Table 5. Super Tie Probabilities

Hit Soft 17				
Outcome	1 Deck	2 Deck	6 Deck	8 Deck
Player & Dealer Hands Bust	0.08237768	0.08190167	0.08160592	0.08157008
Player & Dealer Hands Tie with a 17, 18, or 19	0.05530019	0.05570019	0.05598680	0.05602367
Player & Dealer Hands Tie with a 20	0.03104514	0.03210754	0.03284370	0.03293719
Player & Dealer Hands Tie with a Non-BJ 21	0.00557151	0.00557583	0.00558211	0.00558306
Player & Dealer Hands Tie with BJ	0.00177302	0.00201357	0.00216650	0.00218521
Stand Soft 17				
Outcome	1 Deck	2 Deck	6 Deck	8 Deck
Player & Dealer Hands Bust	0.08009178	0.07967566	0.07941797	0.07938678
Player & Dealer Hands Tie with a 17, 18, or 19	0.05749152	0.05789193	0.05818206	0.05821955
Player & Dealer Hands Tie with a 20	0.03031364	0.03137811	0.03211494	0.03220847
Player & Dealer Hands Tie with a Non-BJ 21	0.00529345	0.00528815	0.00528852	0.00528876
Player & Dealer Hands Tie with BJ	0.00177302	0.00201357	0.00216650	0.00218521

Table 6. Breakout Bonus Probabilities

Hit Soft 17				
Outcome	1 Deck	2 Deck	6 Deck	8 Deck
6, 7 Cards	0.06139225	0.06101801	0.06078918	0.06076163
8 Cards	0.01582619	0.01540219	0.01514076	0.01510918
9 Cards	0.00434552	0.00448782	0.00456466	0.00457339
10 Cards	0.00073107	0.00086552	0.00094894	0.00095902
11 Cards	0.00007737	0.00011618	0.00014421	0.00014780
12+ Cards	0.00000530	0.00001194	0.00001818	0.00001906
Stand Soft 17				
Outcome	1 Deck	2 Deck	6 Deck	8 Deck
6, 7 Cards	0.06061566	0.06026785	0.06005494	0.06002930
8 Cards	0.01488989	0.01451930	0.01429030	0.01426262
9 Cards	0.00390135	0.00404724	0.00412813	0.00413744
10 Cards	0.00061968	0.00073940	0.00081473	0.00082389
11 Cards	0.00006131	0.00009305	0.00011635	0.00011935
12+ Cards	0.00000389	0.00000882	0.00001352	0.00001419

Table 7. Sweet 17 Probabilities

Hit Soft 17				
Outcome	1 Deck	2 Deck	6 Deck	8 Deck
Dealer Has 17	0.13126793	0.13079935	0.13047706	0.13043628
Stand Soft 17				
Outcome	1 Deck	2 Deck	6 Deck	8 Deck
Dealer Has 17	0.14221261	0.14192233	0.14172044	0.14169478

Table 8. Pair Up Plus Probabilities

Outcome	1 Deck	2 Deck	6 Deck	8 Deck
Both Have A Suited Pair		0.00009613	0.00025881	0.00028471
Both Have A Pair		0.00453489	0.00521196	0.00529601
Either Have A Suited Pair	N/A	0.01809433	0.02977575	0.03121462
Either Have A Pair		0.10856597	0.10719268	0.10702154

The probabilities were then combined with the payouts for each wager to determine the Return to Player (RTP) and House Edge (HE) for each wager configuration. The results are summarized in Table 9 through Table 13. Please note that for the Super Tie wager, the Dealer Tip is not counted toward the RTP as it is not awarded to the players; however, it is taken into account for the House Edge calculation, as the Dealer Tip is still paid out by the House. The summary table lists the HE for the \$5 minimum bet and the HE without the dealer tip. As the wager amount on the Super Tie wager increases, the HE will move closer to the *HE (No Tip)* value which serves as an upper bound on the HE.

Table 9. Main Wager Results

		Hit Soft 17			
		1 Deck	2 Deck	6 Deck	8 Deck
3 to 2 BJ	RTP	98.45%	98.45%	98.45%	98.45%
	HE	1.55%	1.55%	1.55%	1.55%
6 to 5 BJ	RTP	97.06%	97.08%	97.09%	97.09%
	HE	2.94%	2.92%	2.91%	2.91%
		Stand Soft 17			
		1 Deck	2 Deck	6 Deck	8 Deck
3 to 2 BJ	RTP	98.17%	98.17%	98.17%	98.17%
	HE	1.83%	1.83%	1.83%	1.83%
6 to 5 BJ	RTP	96.78%	96.79%	96.81%	96.81%
	HE	3.22%	3.21%	3.19%	3.19%

Table 10. Super Tie Results

		Hit Soft 17			
		1 Deck	2 Deck	6 Deck	8 Deck
	RTP	80.06%	81.71%	82.84%	82.98%
	HE (\$5 Min Bet)	13.31%	11.53%	10.33%	10.17%
	HE (No Tip)	19.94%	18.29%	17.16%	17.02%
		Stand Soft 17			
		1 Deck	2 Deck	6 Deck	8 Deck
	RTP	79.38%	81.03%	82.15%	82.30%
	HE (\$5 Min Bet)	14.02%	12.25%	11.04%	10.89%
	HE (No Tip)	20.62%	18.97%	17.85%	17.70%

Table 11. Breakout Bonus Results

Hit Soft 17				
	1 Deck	2 Deck	6 Deck	8 Deck
RTP	84.31%	85.96%	87.07%	87.21%
HE	15.69%	14.04%	12.93%	12.79%
Stand Soft 17				
	1 Deck	2 Deck	6 Deck	8 Deck
RTP	79.57%	81.03%	82.02%	82.14%
HE	20.43%	18.97%	17.98%	17.86%

Table 12. Sweet 17 Results

Hit Soft 17, 5 to 1				
	1 Deck	2 Deck	6 Deck	8 Deck
RTP	78.76%	78.48%	78.29%	78.26%
HE	21.24%	21.52%	21.71%	21.74%
Hit Soft 17, 6 to 1				
	1 Deck	2 Deck	6 Deck	8 Deck
RTP	91.89%	91.56%	91.33%	91.31%
HE	8.11%	8.44%	8.67%	8.69%
Stand Soft 17				
	1 Deck	2 Deck	6 Deck	8 Deck
RTP	85.33%	85.15%	85.03%	85.02%
HE	14.67%	14.85%	14.97%	14.98%

Table 13. Pair Up Plus Results

Paytable 1				
	1 Deck	2 Deck	6 Deck	8 Deck
RTP	N/A	73.37%	83.98%	85.29%
HE	N/A	26.63%	16.02%	14.71%
Paytable 2				
	1 Deck	2 Deck	6 Deck	8 Deck
RTP	N/A	77.90%	88.64%	90.00%
HE	N/A	22.10%	11.36%	10.00%
Paytable 3				
	1 Deck	2 Deck	6 Deck	8 Deck
RTP	N/A	70.89%	85.20%	87.12%
HE	N/A	29.11%	14.80%	12.88%

All analysis assumes a freshly shuffled shoe.

Summary

The maximum RTP that can be obtained from *Breakout Blackjack* is 98.45% which is obtained from placing the main wager when an 8-deck shoe is in use, a Blackjack pays 3 to 2, and the dealer hand is configured to hit a soft-17. The minimum RTP is 70.89%, which comes from placing a Pair Up Plus side wager when a 2-deck shoe is in use and Paytable 3 is configured.

Please visit Gaminglabs.com to view the applicable Terms and Conditions and GLI Product Certification Scheme.

Should you have any questions, please feel free to contact our office.

Sincerely,

GAMING LABORATORIES INTERNATIONAL, LLC



Christine M. Gallo

Senior Vice President, Quality and Technical Compliance