

**Mathematical Analysis
of
Autojack Blackjack**

Prepared by

Joseph Shipman, Ph.D.

shipmangameconsulting@gmail.com

609-216-2182

August 26, 2022

Introduction

Autojack Blackjack is a new variant of Blackjack that offers a regular Blackjack hand, and a Blackjack-styled hand that receives automatic hits and cannot bust. Two optional side bets, “Point n Suit” and “Bust Under 17”, are also offered.

Rules

The game is played with a 6-deck or 8-deck shoe as in regular Blackjack. In addition to their main Blackjack bet, players make an additional “Autojack Ante” bet, and optionally may make “Point n Suit” and “Bust Under 17” side bets. (None of these bets have to be the same size, but the “Point n Suit” bet may have a low maximum allowed bet because of its large payouts.) Players are initially dealt two independent 2-card hands, a regular Blackjack hand and an Autojack hand. The dealer gets an upcard and a hole card as usual. At this point the “Point n Suit” side bet is resolved, based on how many of the player’s 4 cards match the dealer’s upcard in both suit and Blackjack point value (10, J, Q, and K matching each other), using the following pay table:

4 Matches:	1000 to 1
3 Matches:	100 to 1
2 Matches:	15 to 1
1 Match:	5 to 1

The dealer then offers Insurance if showing an Ace, and peeks for Blackjack. If the dealer has Blackjack, the hand is over and players lose their remaining wagers (not counting the Point n Suit bet which has already been settled), except for pushing on whichever of their main and Autojack hands that also have Blackjack. If the dealer does not have Blackjack, players then act on their Blackjack hands as usual (doubling or splitting, hitting or standing, etc.). If the player has Blackjack on his Autojack hand, his Autojack Ante bet is paid at 3 to 2 unless the dealer has Blackjack, and his Autojack hand receives no further action.

Before the dealer acts on his hand, players who did not have Blackjack on their Autojack hand decide whether to Surrender their Autojack Ante bet, or to wager an Autojack Play bet at this time. This wager must be for the same amount as the Autojack Ante bet. If no Autojack Play bet is made, the Autojack Ante bet loses half and half is returned to the player. (In this case, the Autojack hand will play for the Bust Under 17 bet, if the player has one, otherwise it will be discarded.) If either the Autojack Play bet or the Bust Under 17 bet was made, the dealer “automatically” hits the Autojack hand, until its point total equals or exceeds 21. If the Autojack hand exceeds 21 points, the card that caused the bust is removed from the hand. The final point total is the remaining total of the cards in the hand; this is the final Autojack hand.

The dealer acts on his hand, using either the “Stand on soft 17” or “Hit on soft 17” rule. When the dealer is comparing his hand against player Blackjack hands, the regular Blackjack rules apply. When the dealer is comparing his hand against the Autojack hand, the dealer uses the final point total of his hand as in regular Blackjack; unless the dealer busts. If the dealer busts, he will use the point total of his hand before it busted to compare against the Autojack hand. Example: Dealer has a point total of 15, dealer hits and gets an 8. This hand busts when playing against the Blackjack hand, but the dealer gets a point total of 15 for his hand; when playing against the Autojack hand.

Dealer then resolves the remaining Blackjack, Autojack Ante, Autojack Play and Bust Under 17 bets. The Autojack Ante bet is compared against the dealer’s total (prior to busting if the dealer busted) and wins, pushes, or loses if it is higher, the same, or lower, respectively. The Autojack Play bet pushes if the dealer busted, and is otherwise compared in the same way. The Bust Under 17 bet pays 10 to 1 if both player Autojack and dealer hands have a final point total of 12 through 16 (which can only happen if both hands busted), and otherwise loses.

Analysis

The game was analyzed using an “infinite deck approximation” in an Excel Workbook, and the Point n Suit side bet, which is sensitive to shoe size, was analyzed for 6 and 8 decks. An 8-deck sim was performed to check the accuracy of the approximation.

The following results were obtained:

Dealer Stands on Soft 17

Optimal strategy is to Surrender with 14-16 vs 8, 12-16 vs 9, 4-7 and 12-17 vs 10, and 4-9, 12-17, and Soft 12-18 vs Ace. The average bet is 1.64 units (the player makes a play bet whenever he does not surrender and neither he nor the dealer have Blackjack). The House Edge is 5.24% of the Ante, or **3.20%** of the average bet.

Dealer Hits on Soft 17

Optimal strategy is to Surrender with 14-16 vs 8, 12-16 vs 9, 4-7 and 12-17 vs 10, and 4-9, 12-18, and Soft 12-19 vs Ace. The average bet is 1.63 units. The House Edge is 5.92% of the Ante, or **3.62%** of the average bet.

The Bust Under 17 bet wins 8.43% of the time when the dealer stands on soft 17, for a House Edge of **7.23%**. It wins 8.55% of the time when the dealer hits on soft 17, for a House Edge of **5.97%**.

The Point n Suit bet for the 1000-100-15-5 pay table wins 12.54% of the time with a 6-deck shoe, for a House Edge of **10.82%**. It wins 12.81% of the time with an 8-deck shoe, for a House Edge of **8.50%**.

No advantage play analysis was performed. The underlying Blackjack bet was not analyzed because it has the same math as regular Blackjack. Simulation of 4 million games using an 8-deck shoe showed no difference in the House Edge within the statistical margin of error (results within 0.03%, expected standard error 0.05%).