Return To Player

Version 1.0

1.1 Scope and Purpose

This document will define RTP in detail and then it will go on to analyze various casino games. The document will not cover game rules and it is assumed that the reader is conversant with the game rules. In general RTP analysis will cover following areas:

1. Theoretical analysis of probabilistic return to player for casino games will be analyzed in this section. In case of a skill based game a simple strategy will be taken up and then a probabilistic analysis of RTP will be provided.
2. In case of game of chance statistical data for return to player and its variance will be provided. This section will also elaborate on the process of data collection.

1.2 Return To Player (RTP)

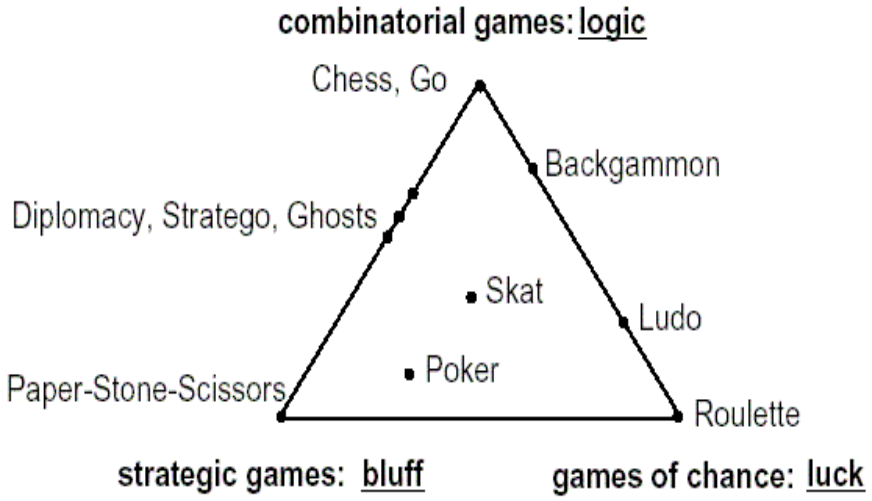
RTP for a game is the parameter that defines in general the rate at which the casino returns the wagered amount to the player when playing that particular game for sufficient number of times. The RTP defines how much of the total amount wagered on a particular game is returned to the player. The game should have a statistical return to the player of at least an advertised minimum unless either (a) the game rules allow players to make a reasonable calculation of the player return or (b) the game rules make the house advantage clear to the player.
Usually slot machines are required to have a player return minimum declared to the player such as 85 or 87% as the player is not given enough information from rules to even roughly estimate the house advantage. On the other hand a simulated casino table game such as roulette will not be required to declare minimum player return as the house advantage can be calculated from the rules available to the player.

1.2.1 Game Categories and RTP

Games in general can be divided into following three categories:

- Games of chance:
  - Probability theory
  - Statistics
- Combinatorial games:
  - Combinatorial game theory
  - Complexity theory, algorithmic
  - Game theory
- Strategic games:
  - Game theory

Following diagram shows how various commonly known games can be categorized:



For games like Keno, Roulette and Craps it is easy to do theoretical analysis because of limited outcomes. For games like Poker, Blackjack which are strategy games, the theoretical analysis is complex and outside the scope of this document. In these cases a strategy will be described and general returns on using this strategy will be quoted from the literature. This can be followed by a statistical analysis of the game.

1.2.2 Nominal Standard Deviation

Another parameter, Nominal Standard Deviation (NSD) tries to capture the standard deviation of RTP over certain number of games. NSD defines how volatile the wagering is. The generally accepted norms to calculate NSD are described in APPENDIX A.

1.3 Theoretical and Statistical Analysis

This section will try to analyze the RTP for various types of games provided by IGMS. The discussion will also focus on the tools used to generate statistical results and the validity of the payout tables and game outcomes promised in various artwork and websites.

1.3.1 Simulated Spinning Reel Games

There are various types of simulated spinning reel games offered by the IGMS. In general these van be divided into three and five reel multi line slot machines. For the slot machines its not possible to mathematically calculate the RTP from the game rules and the payout tables published by the casinos. In this case the player has to depend on the values published by the casino in various artwork and on the websites.
For websites running IGMS like Starluck and Planetluck the RTP values published are around 97%.

1.3.1.1 Simulation Tools

Tools have been developed to simulate the slot machines with various combinations of line selected.
Following table summarizes the result for various slot machine games with single and multiple lines selected.

Slot Machine Name	Single Line 50K	Single Line 100k	Two Lines 50K	Two Line 100K
3-Reel Multi-Payline Slots				
Golden Gopher				
Dungeon Magic Gold				
Survival Slot				
5-Reel Multi-Payline Slots				
Magic Man				
Predator				
Goanna Gold				
Treasure of the Deep				
Silver City				
Black Cherry				
Progressive Slots				
Wheel of Fortune				
Super Stars				
Jackpot Party				
Three Reel Slots				
Metropolis				
Golden Eagle				
Triple Wild Rose				
Triple Wild Samba				
Indian Riches				

1.3.2 Keno

The probability of catching exactly r spots when you bet on N of them (where N >= r) is given by:

P(N,r) = c(N,r) * c(80-N, 20-r) / c(80,20).

In other words, P(N,r) is the number of ways that you can pick r of the N spots times the number of ways that the computer can pick all of the spots that you didn't bet on divided by the ways that it can pick twenty spots. Note that c(N,r) is the famous "binomial coefficient" or combination of r from n, where

c(N,r) = f(N,r) / f(r,r),

and we can define f(n,r) according to the rules

f(n,0) = 1, otherwise f(n,r) = n * f(n-1,r-1).

Following are the mathematical return for the IGMS keno:

Played[N]	Hits[r]	Bet $1	Probability	RTP
10	10	5000	1.122E-07	0.000561
	9	2500	6.121E-06	0.015302
	8	500	0.0001354	0.06771
	7	100	0.0016111	0.161114
	6	10	0.0114794	0.114794
	5	5	0.0514277	0.257138
			Total	0.616619

Played[N]	Hits[r]	Bet $1	Probability	RTP
9	9	5000	7.243E-07	0.003621
	8	2500	3.259E-05	0.081481
	7	250	0.0005917	0.14792
	6	25	0.0057196	0.142989
	5	5	0.0326015	0.163007
			Total	0.539018

Played[N]	Hits[r]	Bet $1	Probability	RTP
8	8	5000	4.346E-06	0.021728
	7	1250	0.0001605	0.200569
	6	50	0.0023667	0.118336
	5	5	0.0183026	0.091513
			Total	0.432146

Played[N]	Hits[r]	Bet $1	Probability	RTP
7	7	5000	2.44E-05	0.122013
	6	125	0.0007321	0.09151
	5	10	0.0086385	0.086385
	4	5	0.052191	0.260955
			Total	0.560862

Played[N]	Hits[r]	Bet $1	Probability	RTP
6	6	1000	0.000129	0.128985
	6	25	0.000129	0.003225
	4	5	0.0285379	0.14269
	3	2	0.1298195	0.259639
			Total	0.534538

Played[N]	Hits[r]	Bet $1	Probability	RTP
5	5	125	0.0006449	0.080616
	4	10	0.0120923	0.120923
	3	5	0.0839351	0.419675
			Total	0.621214

Played[N]	Hits[r]	Bet $1	Probability	RTP
4	4	50	0.0030634	0.15317
	3	5	0.0432479	0.216239
	2	2	0.2126355	0.425271
			Total	0.79468

Played[N]	Hits[r]	Bet $1	Probability	RTP

The RTP for IGMS keno is up to 79%.

1.3.3 Roulette

The single-zero roulette game (American Roulette) has 37 possible cases (36 numbers, plus 0). The double-zero roulette game (European Roulette) has 38 possible cases (36 numbers, plus 0, plus 00). The odds vary with the type of bet. For example, the even-money bet: black/red, odd/even, high/low. There are 18 red numbers and 18 black numbers. The odds are calculated as 18 / 37 = 48.65% or 18 / 38 = 47.37%.

Following table show the RTP for various types of bets.

Bet	Description	Pay Out for $1 bet	Probability (assuming American Roulette)	RTP
Straight up	Place bet directly on any single number	35	0.02702703	0.945946
Split bet	Place bet between any two numbers	17	0.05405405	0.918919
Street bet	Place bet at the end of any row of numbers, covering three numbers	11	0.08108108	0.891892
uarter or Corner b	Place bet on the corner where any four numbers meet. Covers all four numbers	8	0.10810811	0.864865
Line bet	Place bet at the end of two streets on the line between them. A line bet covers all the numbers in either street, for a total of six	5	0.15384615	0.769231
American Roulette	37			

For various types of roulette bets the RTP can vary from 92% to 76%.

1.3.4 Craps

There are a bewildering variety of bets that can be made in craps. For our analysis we will consider only a few types of bets, which are shown in the following table.

Bet	Payoff for $1 bet	Probability	RTP
Pass Line Bet	1	0.492929293	0.492929293
Any Seven	4	0.166666667	0.666666667
Eleven	15	0.055555556	0.833333333
Any Craps(2,3,12)	7	0.111111111	0.777777778
Craps 2	30	0.027777778	0.833333333
Craps 3	15	0.055555556	0.833333333
Craps 12	30	0.027777778	0.833333333
Hard 4 or Hard 10	7	0.111111111	0.777777778
Hard 6 or Hard 8	9	0.090909091	0.818181818
Field(3,4,9,10,11)	2	0.388888889	0.777777778
Field (2, 12)	15	0.055555556	0.833333333

Sample mathematical calculations, which were used to arrive at the above table, are shown in APPENDIX B.

1.3.5 Video Poker

A deck of 52 cards is used. The player first draws 5 cards. Now he can select 0-5 cards to hold. The remaining cards are replaced from rest of 47 cards. The payoff depends on the payoff table and the 5 final cards. The strategy is optimizing the hold cards after the first draw. There are approx 2.6 millions ways to get the first five cards. There are 32 possible decisions of holding 5 cards.

Lets look at a simple strategy for Jacks or Better.
To use the strategy look up all viable ways to play an initial hand on the following list and elect that which is highest on the list. A "high card" means a jack or higher.

- Full house or better
- 4 to a royal flush
- Straight, three of a kind, or flush

- 4 to a straight flush
- Two pair
- High pair
- to a royal flush
- to a flush
- Low pair
- to an outside straight
- suited high cards
- to a straight flush
- unsuited high cards (if more than 2 pick then pick lowest 2)
- Suited 10/J, 10/Q, or 10/K
- One high card
- Discard everything

Terms:
High card: A jack, queen, king, or ace. These cards are retained more often because if paired up they return the original bet.
Outside straight: An open ended straight that can be completed at either end, such as the cards 7,8,9,10.
Inside straight: A straight with a missing inside card, such as the cards 6,7,9,10. In addition A,2,3,4 and J,Q,K,A also count as inside straights because they are at an extreme end. For an example look in APPENDIX C.

For the above-mentioned strategy following table tabulates the RTP for IGMS video poker game of Jacks or Better.**

	Payoffs for $1	Probability	RTP
Royal flush	250	0.000025	0.00625
Straight flush	50	0.000111	0.00555
Four of a kind	25	0.002363	0.059075
Full house	8	0.011517	0.092136
Flush	5	0.011087	0.055435
Straight	4	0.010637	0.042548
Three of a kind	3	0.074543	0.223629
Two pair	2	0.129552	0.259104
Pair	1	0.214437	0.214437
Nothing	0	0.545729	0
Total		1	0.958164

1.3.6 Blackjack

Blackjack is a common game and is available in almost all casinos with minor variations. In case of IGMS Blackjack the payouts and the rules are very

standard. The RTP of Blackjack if played with some strategy is more than 90%. The strategy can be devised from the info given in APPENDIX D.

1.3.7 Caribbean Poker

The Strategy: The player should raise on any pair or better, fold on anything less than ace/king, and should sometimes raise and sometimes fold on ace/king.

Following the above very simple strategy following statistics is derived:

Event/winning hand	Pays	Probability	Average return
Ace/king	3	0.00092838	0.00278514
Pair	3	0.11662647	0.34987941
Two pair	5	0.02448234	0.1224117
Three of a kind	7	0.01175138	0.08225966
Straight	9	0.00219761	0.01977849
Flush	11	0.00109651	0.01206161
Full house	15	0.00083401	0.01251015
Four of a kind	41	0.0001421	0.0058261
Straight flush	101	0.00000787	0.00079487
Royal flush	201	0.00000084	0.00016884
Ante only	1	0.22738482	0.22738482
Push	0	0.00001614	0
Total			0.83586079

With a slightly sophisticated strategy, return more than 85% are easily possible.

1.3.8 Baccarat

Baccarat is another standard game, which is also provided by the IGMS gaming system. The following table shows the house edge on all available bets. All winning wagers for the Banker and the Player pay even money. However, if player wins by betting on the Banker, the bank receives 5% commission. If the player correctly wagers that the two hands will tie, his payoff is 8 to 1.

Bet	Combinations	Return on $1 bet	Probability	Return to Player
Bank	2,292,252,566,437,880	0.95	0.4586	0.43567
Player	2,230,518,282,592,250	1	0.4462	0.4462
Tie	475,627,426,473,216	8	0.0952	0.7616
	Average RTP			0.547823

1.4 APPENDIX A: Calculation of NSD

In determining the NSD for a game, the following conventions must be applied:

(i) Calculate standard deviation of the base game at minimum bet and single line play or equivalent. (Should the underlying game algorithm or randomizing mechanism change with a change to play options selected (e.g. different virtual reels are activated upon a change to the number of lines played or certain prize categories are only available by selecting specific play options), the highest standard deviation result must be used);

(ii) Coinciding prizes are to be treated as separate prizes (e.g. a pay-line prize of 20 coinciding with a scatter prize of 50 are to be treated as two separate prizes of 20 and 50);

(iii) Feature game prize contribution must, as a minimum, be calculated using a set of individual feature prizes with corresponding weighted probabilities for each prize. (The calculation method must not use the mean of all feature prizes treated as a single base game prize);

(iv) For the purposes of c) above, feature game prizes are to be calculated under conditions applicable to the feature when the base game is in the mode referred to in a) above (i.e. using the same bet and line pattern or equivalent); Gamble features (i.e. Double-up) are to be excluded;

(v) Progressive prize components, both standalone and linked, are to be excluded;

(vi) All calculations must be made to a minimum accuracy of four decimal places and the NSD must be reported to a minimum accuracy of two decimal places.

1.5 APPENDIX B: Craps

Following table shows the probability of occurrence of a particular sum in a roll:

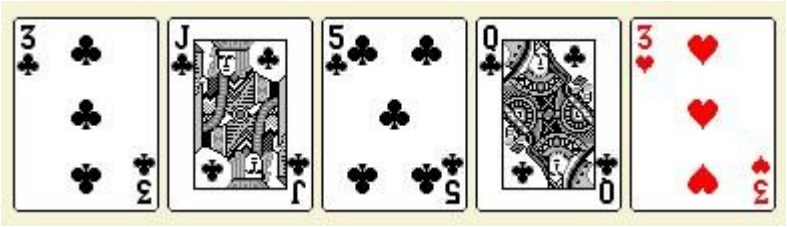
z	2	3	4	5	6	7	8	9	10	11	12
$\boldsymbol{P(Z_1 = z)}$	1 / 36	2 / 36	3 / 36	4 / 36	5 / 36	6 / 36	5 / 36	4 / 36	3 / 36	2 / 36	1 / 36

Following table shows the probability of making the point z:

z	4	5	6	8	9	10
$\boldsymbol{P(I = 1 \mid Z_1 = z)}$	3 / 9	4 / 10	5 / 11	5 / 11	4 / 10	3 / 9

1.6 APPENDIX C: Jacks or Better Strategy**

Example: Suppose you have the following hand.



The top three plays are (1) keep the low pair, (2) keep the 4 to a flush, and (3) keep the 2 suited high cards. The 4 to a flush is listed highest and is thus the best play, so discard the 3 of hearts.

1.7 APPENDIX D: Blackjack**

The following tables display expected returns for any play in blackjack based on the following rules: dealer stands on a soft 17, an infinite deck, the player may double after a split, split up to three times except for aces, and draw only one card to split aces. Based on these rules the house edge is -0.511734%.

To use this table look up the returns for any given play, the one with the greatest return is the best play. For example suppose you have two 8's and the dealer has a 10. The return by standing is -0.5404, by hitting is -0.5398, doubling is -1.0797, and by splitting is -0.4807. So splitting 8's you stand to lose the least, 48.07 cents per original dollar bet, and is thus the best play.

Player's Expected Return by Standing

Player's Hand	Dealer's Up Card									
	2	3	4	5	6	7	8	9	10	Ace
0-16	-0.2928	-0.2523	-0.2111	-0.1672	-0.1537	-0.4754	-0.5105	-0.5431	-0.5404	-0.667
17	-0.153	-0.1172	-0.0806	-0.0449	0.0117	-0.1068	-0.382	-0.4232	-0.4197	-0.478
18	0.1217	0.1483	0.1759	0.1996	0.2834	0.3996	0.106	-0.1832	-0.1783	-0.1002
19	0.3863	0.4044	0.4232	0.4395	0.496	0.616	0.5939	0.2876	0.0631	0.2776
20	0.64	0.6503	0.661	0.6704	0.704	0.7732	0.7918	0.7584	0.5545	0.6555
21	0.882	0.8853	0.8888	0.8918	0.9028	0.9259	0.9306	0.9392	0.9626	0.9222

Player's Expected Return by Hitting

Player's Hand	Dealer's Up Card									
	2	3	4	5	6	7	8	9	10	Ace
4	-0.1149	-0.0826	-0.0494	-0.0124	0.0111	-0.0883	-0.1593	-0.2407	-0.2892	-0.2531
5	-0.1282	-0.0953	-0.0615	-0.024	-0.0012	-0.1194	-0.1881	-0.2666	-0.3134	-0.2786

6	-0.1408	-0.1073	-0.0729	-0.0349	-0.013	-0.1519	-0.2172	-0.2926	-0.3377	-0.3041
7	-0.1092	-0.0766	-0.043	-0.0073	0.0292	-0.0688	-0.2106	-0.2854	-0.3191	-0.3101
8	-0.0218	0.008	0.0388	0.0708	0.115	0.0822	-0.0599	-0.2102	-0.2494	-0.197
9	0.0744	0.1013	0.129	0.158	0.196	0.1719	0.0984	-0.0522	-0.153	-0.0657
10	0.1825	0.2061	0.2305	0.2563	0.2878	0.2569	0.198	0.1165	0.0253	0.0814
11	0.2384	0.2603	0.283	0.3073	0.3337	0.2921	0.23	0.1583	0.1195	0.143
12	-0.2534	-0.2337	-0.2135	-0.1933	-0.1705	-0.2128	-0.2716	-0.34	-0.381	-0.3505
13	-0.3078	-0.2912	-0.2742	-0.2573	-0.2356	-0.2691	-0.3236	-0.3872	-0.4253	-0.3969
14	-0.3622	-0.3487	-0.3349	-0.3214	-0.3007	-0.3213	-0.3719	-0.4309	-0.4663	-0.44
15	-0.4166	-0.4062	-0.3956	-0.3855	-0.3658	-0.3698	-0.4168	-0.4716	-0.5044	-0.48
16	-0.471	-0.4638	-0.4563	-0.4495	-0.4309	-0.4148	-0.4584	-0.5093	-0.5398	-0.5171
17	-0.5362	-0.5317	-0.527	-0.523	-0.5088	-0.4835	-0.506	-0.5537	-0.5845	-0.5573
18	-0.6224	-0.62	-0.6175	-0.6153	-0.6075	-0.5911	-0.5911	-0.6165	-0.6477	-0.6265
19	-0.7291	-0.728	-0.7269	-0.726	-0.7226	-0.7154	-0.7137	-0.7156	-0.7294	-0.7248
20	-0.8552	-0.855	-0.8547	-0.8545	-0.8536	-0.8519	-0.8515	-0.8508	-0.849	-0.8521
21	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
A,A	0.0818	0.1035	0.1266	0.1565	0.186	0.1655	0.0951	0.0001	-0.07	-0.0205
A,2	0.0466	0.0741	0.1025	0.1334	0.1617	0.1224	0.0541	-0.0377	-0.1049	-0.0573
A,3	0.0224	0.0508	0.0801	0.1119	0.1392	0.0795	0.0133	-0.0752	-0.1395	-0.0939
A,4	-0.0001	0.0292	0.0593	0.092	0.1182	0.037	-0.0271	-0.1122	-0.1737	-0.13
A,5	-0.021	0.0091	0.04	0.0734	0.0988	-0.0049	-0.0668	-0.1486	-0.2074	-0.1656
A,6	-0.0005	0.029	0.0593	0.0912	0.1281	0.0538	-0.0729	-0.1498	-0.1969	-0.1796
A,7	0.0629	0.0902	0.1185	0.1476	0.1908	0.1707	0.0397	-0.1007	-0.1438	-0.0929
A,8	0.124	0.1493	0.1756	0.203	0.2398	0.2206	0.1523	0.0079	-0.0881	-0.0057
A,9	0.1825	0.2061	0.2305	0.2563	0.2878	0.2569	0.198	0.1165	0.0253	0.0814
A,10	0.2384	0.2603	0.283	0.3073	0.3337	0.2921	0.23	0.1583	0.1195	0.143

Player's Expected Return by Doubling

Player's Hand	Dealer's Up Card 2	3	4	5	6	7	8	9	10	Ace
4	-0.5856	-0.5045	-0.4221	-0.3344	-0.3074	-0.9508	-1.021	-1.0863	-1.0809	-1.3339
5	-0.5856	-0.5045	-0.4221	-0.3344	-0.3074	-0.9508	-1.021	-1.0863	-1.0809	-1.3339
6	-0.5641	-0.4837	-0.4021	-0.3156	-0.2819	-0.894	-1.0013	-1.0678	-1.0623	-1.3048
7	-0.4358	-0.3598	-0.2823	-0.2027	-0.1383	-0.5893	-0.8471	-0.9571	-0.9509	-1.1305
8	-0.2045	-0.1362	-0.0664	0.0035	0.087	-0.1877	-0.452	-0.7185	-0.7466	-0.8107
9	0.0611	0.1208	0.1819	0.2431	0.3171	0.1043	-0.0264	-0.301	-0.4667	-0.4329
10	0.3589	0.4093	0.4609	0.5125	0.5756	0.3924	0.2866	0.1443	-0.0087	-0.014
11	0.4706	0.5178	0.566	0.6147	0.6674	0.4629	0.3507	0.2278	0.1797	0.1091
12	-0.5068	-0.4674	-0.4271	-0.3865	-0.3411	-0.5067	-0.6157	-0.7375	-0.7968	-0.8293
13	-0.6156	-0.5824	-0.5484	-0.5147	-0.4713	-0.5874	-0.691	-0.8078	-0.8675	-0.8806
14	-0.7244	-0.6975	-0.6698	-0.6428	-0.6015	-0.6681	-0.7663	-0.8781	-0.9382	-0.9318
15	-0.8332	-0.8125	-0.7912	-0.7709	-0.7317	-0.7488	-0.8416	-0.9484	-1.0089	-0.9831
16	-0.942	-0.9275	-0.9126	-0.899	-0.8619	-0.8296	-0.9169	-1.0186	-1.0797	-1.0343
17	-1.0723	-1.0633	-1.054	-1.046	-1.0175	-0.967	-1.012	-1.1074	-1.1689	-1.1146
18	-1.2449	-1.24	-1.2349	-1.2305	-1.215	-1.1823	-1.1821	-1.2331	-1.2953	-1.253
19	-1.4582	-1.4561	-1.4539	-1.452	-1.4451	-1.4309	-1.4273	-1.4311	-1.4589	-1.4496
20	-1.7105	-1.71	-1.7094	-1.709	-1.7073	-1.7037	-1.703	-1.7017	-1.6981	-1.7043

21	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
A,A	-0.0716	-0.0072	0.0584	0.126	0.1797	-0.1839	-0.3144	-0.4564	-0.514	-0.6244
A,2	-0.0716	-0.0072	0.0584	0.126	0.1797	-0.1839	-0.3144	-0.4564	-0.514	-0.6244
A,3	-0.0716	-0.0072	0.0584	0.126	0.1797	-0.1839	-0.3144	-0.4564	-0.514	-0.6244
A,4	-0.0716	-0.0072	0.0584	0.126	0.1797	-0.1839	-0.3144	-0.4564	-0.514	-0.6244
A,5	-0.0716	-0.0072	0.0584	0.126	0.1797	-0.1839	-0.3144	-0.4564	-0.514	-0.6244
A,6	-0.007	0.0551	0.1187	0.1824	0.2561	-0.0138	-0.2551	-0.401	-0.4583	-0.5372
A,7	0.1197	0.1776	0.237	0.2952	0.3815	0.2199	-0.0299	-0.2902	-0.3469	-0.3628
A,8	0.2419	0.2958	0.3512	0.406	0.4796	0.3198	0.1953	-0.0729	-0.2355	-0.1884
A,9	0.3589	0.4093	0.4609	0.5125	0.5756	0.3924	0.2866	0.1443	-0.0087	-0.014
A,10	0.4706	0.5178	0.566	0.6147	0.6674	0.4629	0.3507	0.2278	0.1797	0.1091

Player's Expected Return by Splitting

Player's Hand	Dealer's Up Card 2	3	4	5	6	7	8	9	10	Ace
2,2	-0.0843	-0.0156	0.0591	0.1517	0.2269	0.0067	-0.1767	-0.3869	-0.5072	-0.4336
3,3	-0.1377	-0.0563	0.0299	0.1263	0.2013	-0.053	-0.2318	-0.4366	-0.5535	-0.4824
4,4	-0.1923	-0.1087	-0.0204	0.0819	0.1514	-0.1665	-0.3261	-0.5112	-0.625	-0.5602
5,5	-0.2902	-0.2087	-0.1193	-0.0192	0.0454	-0.2939	-0.4542	-0.6341	-0.73	-0.6688
6,6	-0.2126	-0.1197	-0.0213	0.0809	0.1537	-0.2644	-0.4251	-0.6106	-0.7161	-0.6534
7,7	-0.1315	-0.0437	0.0493	0.1467	0.2474	-0.0501	-0.392	-0.5776	-0.6573	-0.6516
8,8	0.0739	0.1462	0.2208	0.2975	0.4093	0.321	-0.0227	-0.3872	-0.4807	-0.3725
9,9	0.1956	0.2585	0.3235	0.392	0.4713	0.3648	0.2344	-0.078	-0.3173	-0.1368
10,10	0.1348	0.2128	0.2934	0.3804	0.4681	0.2966	0.0644	-0.2067	-0.3713	-0.2495
A,A	0.4706	0.5178	0.566	0.6147	0.6674	0.4629	0.3507	0.2278	0.1797	0.1091

** The source of this information is “The Wizard of the Odds”