June 22, 2020

Jacqueline Hunter
Scientific Games
6601 S. Bermuda Rd.
Las Vegas, NV 89119

Dear Ms. Hunter,

Due to COVID-19 and at the manufacturer's request, the following games can be dealt face-up until further notice:

Caribbean Stud Poker	Crazy 4 Poker
Crazy 4 Poker Progressive	Four Card Poker
Four Card Poker Bad Beat Bonus	Four Card Poker Progressive
Let it Ride	Let it Ride Bonus
Let it Ride Progressive	Mississippi Stud
Mississippi Stud Progressive	Mississippi Stud with 3 Card Bonus
Three Card Poker	Three Card Poker, 6 Card Bonus
Three Card Poker Bonus	Three Card Poker Face Up
Three Card Poker Progressive	Ultimate Texas Hold'em
Ultimate Texas Hold'em Bad Beat Bonus	Ultimate Texas Hold'em Progressive
Ultimate Texas Hold'em Ultimate Pairs Bonus	

No other modifications to the dealing procedures, game rules, or payouts are authorized.

Prior to implementing face-up dealing, licensees should

- Review "*Scientific Games – Table Game Operations Impact of Dealing Games Face Up"*, which is attached;
- Consider how play in this manner could affect the odds, play on the game, and be conducted in compliance with any state or county imposed COVID-19 public health requirements; and
- Submit their internal controls and receive approval from the Commission.

If you have any questions on commercial implementation, please contact Brian Lane at (509) 387-7095. If you have any questions on Tribal implementation, please contact Kelly Main at (206) 423-4260.

Sincerely,

Tina Griffin
Assistant Director
Licensing, Regulation, and Enforcement

Attachment – "*Scientific Games – Table Game Operations Impact of Dealing Games Face Up*"

Scientific Games – Table Game Operations
Impact of Dealing Games Face Up

The purpose of this report is to analyze the approximate impact of dealing several Scientific Games proprietary table games 'face up'. It is assumed that no more than THREE Players will be playing at the same time and that all cards normally dealt to the Player will be dealt face up.

Introduction:

It is a given that providing the Player with any additional information about the cards that have already been dealt can only allow the Player to enhance his strategy and reduce the house edge and potentially turn it into a Player edge. In this particular case, the additional information is knowledge about the other Players' cards which would normally be kept hidden from the other Players. Knowledge about these cards can inform the Player both about his potential draws (if any exist) and about the Dealer's potential hand.

This is a little like Blackjack card counting with one very important distinction. In Blackjack, knowledge about the cards remaining in the shoe can be used to determine how much the Player should wager on the next hand. This is what provides the biggest advantage to the Player. In Blackjack, the Player may get an advantage in only 10% of the hands and by just 0.25%. If a Player could not alter his wager size with this knowledge, the Player would not have an overall advantage. But, if he can increase his wager 50x on these hands, the overall payback over time would show a Player advantage.

In single deck games, this is not possible. The Player has no opportunity to change his initial wager size. Instead, he is only able to alter his strategy in-game and in some cases, his in-game wager size. This greatly reduces the Player's ability to take advantage of 'player advantage' situations.

The goal of this analysis is to get a rough idea of the impact of the Player being able to see the hands of two additional Players. This is not intended as a comprehensive analysis as that would likely take weeks per game to do properly. Instead, the main purpose is to ascertain if playing the game face up poses a significant risk to the casino. Because of this, parts of the analysis relied on work done and published by another analyst – Stephen Howe. In each case where I leverage his work, I have included the URL of the column that I utilized.

Three Card Poker

Three Card Poker has a single strategy point – when to Play vs. Fold. Thus, knowing what the additional six cards are, can guide the Player by changing the distribution of potential Dealer hands. Mostly, it can tell the Player how often the Dealer will not qualify which can changed the strategy for Jack or less hands. If 4 out of the 6 cards are Q/K/A, the hand becomes a marginal Play. With 5 or 6, much more strongly, but it is rather rare for 5 of the 6 to be Q/K/A. In similar fashion, if all 6 cards are low cards, there are some Q-6, Q-7 hands that should be Folded because there is a greater likelihood that the Dealer will qualify and doing so means he will likely beat the Player. While it is much more common for all 6 cards to be low, the impact is to a limited number of Player hands and the impact is not great as these hands are only marginal plays. If the Player has above a Q-8 or Q-9, the strategy is still to always Play.

Based on simulations using the strategy changes, the impact to payback would appear to be only about 0.1% – 0.2% at most with 6 additional cards displayed.

<u>Let It Ride</u>

As Let It Ride is a paytable game, the impact is only on the Player's hand. The Player may see cards that he needs to complete his hand that have been burnt, which can reduce the potential value of his hand. Or, conversely, he may see that his needed cards are still available out of the remaining deck, with a slightly increased probability of being dealt to him.

That said, however, Let It Ride's relatively high house edge is unlikely to be able to be overcome as a result of seeing 6 additional face up cards. Given the mandatory '$' wager with a payback of only 62.7%, the '1' and '2' wagers would need to get a significant advantage out of those 6 cards. But, the vast majority of hands wagered are guaranteed winners. That said, there are a few strategy changes that would occur as a result of seeing the extra 6 cards.

'1' Wager

- Do not wager any 3-Card SFL or Royal if any of the out cards for the SFL/Roy have been burned
- Wager all 3-Card Inside SFLs if none of the 6 other cards are of the same suit.
- Wager a Low Pair, IF none of the 6 cards are of the same rank as either of the Player's rank

'2' Wager

- If you have a 4-Card Flush and all 6 of the other cards are of same suit, don't make wager
- If you have a 4-Card Flush with 0 High Cards and 5 of the other cards are of same suit, don't make wager
- If you have a 4-Card Straight with 0 High Cards, and 2 of your (Straight) outs are burned, don't make the wager
- If you have a 4-Card Straight with 1 High Card and 3 of your (Straight) outs are burned, don't make the wager
- If you have a 4-Card Straight with 2 High Cards and 4 of your (Straight) outs are burned, don't make the wager
- If you have a 4-Card Straight with 3 High Cards and 5 of your (Straight) out are burned, don't make the Wager

The biggest strategy impact is the wagering of a Low Pair in the '1' wager. This increase the payback by roughly 0.2%. The other changes occur infrequently and likely do not add more than another 0.1%. The overall impact should be at most 0.3% to the house advantage.

Ultimate Texas Hold'em

UTH is one of the more likely games to be impacted by the Player's cards being dealt face up. With a small theoretical house advantage, it does not take much movement of the payback to potentially give the Player an advantage over the house.

That said, there are several features of UTH that work against this from happening. The first is that there are only TWO cards per Player dealt. So, the Player only gets to see four additional cards. For the Player to take advantage of the situation, the information must be actionable. If a Player has an AK and one of the 4 face up cards is also an Ace, this will reduce the Player's expected value of the hand, but not by enough to change how he should wager – he should still Wager 4x.

The impact of any strategy change to the overall payback is controlled by 2 factors. How often the situation occurs and how much it increases the expected value of that situation. From running a variety of scenarios, the number of situations in which the Player changes his strategy is rather small. Thus, the overall impact to the payback is also very small. The fact that the remaining cards are community cards shared between Player and Dealer also means that cards that are burnt that might hurt the Player can also likely hurt the Dealer as well.

Lastly, the strategy of UTH is already extremely complex. The theoretical payback can only be achieved by a tiny fraction of Players. The ability to go further and take into account the face up cards would reduce this population even further.

For my conclusion, regarding UTH, I am also relying on a more exhaustive analysis performed by Stephen Howe that can be found here: https://discountgambling.net/2010/01/15/practical-collusion-for-ultimate-texas-holdem/

In the end, I don't believe any human could possibly achieve a Player advantage with only two additional Player's cards turned Face up on a live game.

Caribbean Stud Poker

For Caribbean Stud Poker, I mostly relied on work already done by Stephen Howe. His column can be found here:

https://discountgambling.net/category/caribbean-stud/

There are actually 2 columns at the site. They both use a method that might be considered 'cheating' when the cards are dealt face down but would become unnecessary with cards dealt Face Up. The method mostly deals with counting cards that match the Dealer's Face up card and counting the number of Aces and Kings.

Per Mr. Howe's column the house edge of 5.32% (as a percent of the Ante) can be turned into a 1.1% Player advantage using his methods when there are 7 Players at the table. Per his second column, with only 6 Players, it can be turned into a 0.4% House edge using a computer and a more realistic 1.32% house edge using a simplified strategy.

Because Caribbean Stud has 5 cards per Player, dealing potentially 25-30 additional cards face up, can be very advantageous to the Player. With only an additional 10 cards being show on a 3 Player table, the number of times the Player will alter from basic strategy will be greatly reduced.

There is nothing in his column that talks about the impact of less Players at the table. However, if going from 7 Players to 6 Players reduced the impact by as much as 1.5% (of the Ante), I feel it is safe to assume that no Player will be able to come close to a Player advantage playing at a 3-Player table. Undoubtedly, a few Players will be able to shave a little off the house edge, but it is doubtful that it would be more than 0.25% of total wager.

Mississippi Stud Poker

For Mississippi Stud Poker, I again relied on work already done by Stephen Howe. His columne can be found here:

https://discountgambling.net/mississippi-stud-ev-barona/

I don't know if Barona still does, but apparently it did offer MS Stud face up with up to 6 players. Per Mr. Howe's analysis, when the Player can see all 12 cards belonging to the Players, he can turn the 4.91% house edge into a roughly 1.5% Player edge. It should be noted that the numbers that he references are a % of the initial Ante and not total wager. When the average wager size is taken into account, this correlates to a house edge of 1.37% of the total wager. The 1.5% Player edge is really a Player edge of about 0.42% of total wager.

Thus, the total swing is about 1.8%. If the impact of seeing each additional Player's cards were linear, this would mean each Player's cards that could be seen would be worth about 0.36% of total wager. My experience in doing these analyses would indicate that the impact is not linear but more exponential. Thus seeing 2 Player's cards is worth far LESS than 40% of the total. The true impact is likely to be less than a payback of 99.4% and probably closer to about 99%.

It should also be noted that the strategy for Mississippi Stud is moderately complex and utilizing the face up cards to modify the strategy will require a Player to calculate outs on the fly. There will not be many Players who will be able to do this. Some very skilled Players might be able to lower the house edge, but it is unlikely that any will be able to gain a Player advantage.

Four Card Poker

Four Card Poker follows a structure similar to Three Card Poker with a couple of key differences. The majority of the impact of face up cards in Three Card Poker is the impact they have on the Dealer qualifying. There is no Dealer qualifying in Four Card Poker, so this is no longer an impact. In Four Card Poker, the Dealer has one card turned face up. Thus, the Player can look for at the other face up cards for rank matches to the Dealer's upcard. This will impact the Dealer's ability to draw Pairs+. The Player may also be able to take into account cards of higher rank this his own Pair and/or Aces when he is playing a non-Pair hand.

Like Three Card Poker, there will be a handful of changes, but they will not add up to much. In Stephen Howe's column on collusion for Four Card Poker, found here: (https://discountgambling.net/category/four-card-poker/), he states that with 6 Players at the table the house edge can be cut in half. As we are talking about a situation of only 3 Players, the impact will be far less and again is likely to be no more than 0.25% of total wager.

Crazy 4 Poker

Crazy 4 Poker is more similar to Three Card Poker than is Four Card Poker. There is no Dealer card dealt Face up, but there is qualifying. So, like Three Card Poker, most of the impact surrounds the frequency that the Dealer qualifies. While the ability to wager 3x might be a factor as well, it can only be done with a Pair of Aces or better, mostly removing it from the equation. Like Three Card Poker, the impact to being able to see additional cards will be minimal and most Players will not be able to take advantage.

Conclusion

None of my own research nor anything I could find elsewhere would indicate that any of the games mentioned in this report can be 'beaten' by dealing a total of 3 hands face up. The extent by which a Player can reduce the house edge will depend on the specifics of each game. In all cases, it would take a very well-trained Player to do so.

Some likely indications that a Player might be attempting to fully use the information available would be one that is playing relatively slowly. As many of the strategy changes require counting 'outs', a Player utilizing these strategies will have to study far more cards than normal.

Generally speaking, any Player who considers himself to be an 'Advantage' Player, believing himself to have an advantage over the house will unlikely play any of the side-bets, which generally have lower paybacks and do not have any opportunities to reduce the house edge as a result of the additional information.

Game	Maximum Spots Recommended
Caribbean Stud Poker	5
DJ Wild Stud Poker	4
I Luv Suits	5
Mississippi Stud	4
Crazy 4 Poker	Not Beatable
Face Up Pai Gow Poker	Not Beatable
Fortune Pai Gow Poker	Not Beatable
Four Card Poker	Not Beatable
Let it Ride	Not Beatable
Three Card Poker	Not Beatable
Ultimat Texas Hold'em	Not Beatable

THREE CARD POKER (FACE-UP)
RULES OF PLAY

1. Three Card Poker is a game where players compete against the dealer and against a "Pair Plus" bonus paytable.

2. Players make an Ante bet to compete against the dealer. Players make the Pair Plus bet to compete against the bonus paytable.

3. Players get three cards. The dealer gets three cards—two face down, one face up.

4. At this point, players have a choice:
   a. Fold and surrender their Ante bet.
   b. Stay in the game by making a Play bet in an amount equal to the Ante.

5. The dealer then reveals his hand.

6. If the dealer has less than Queen-high, he immediately returns each player's Ante bet. The remaining Play and (optional) Pair Plus bet receive action.

7. If the dealer has at least Queen-high, all bets receive action.

8. The dealer then compares his hand with each player's.

   a. If the dealer wins, the player loses his Play and, if applicable, Ante bet.
   b. If the player wins, his Play and, if applicable, Ante bets win even money.

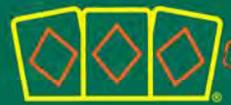9. Pair Plus wins if the player has a pair or better. See layout for odds.

Three Card Poker - Face Up
Paytable Summary

Paytable Designator	TCP-01	TCP-02	TCP-03	TCP-04
Description	A/A	A/B	A/C	A/D
	Pair Plus A	**Pair Plus B**	**Pair Plus A**	**Pair Plus B**
OUTCOME	Pair Plus Paytable	Pair Plus Paytable	Pair Plus Paytable	Pair Plus Paytable
Straight Flush	40	40	40	40
Three of a Kind	30	25	30	30
Straight	6	6	5	6
Flush	4	4	4	3
Pair	1	1	1	1
Par per Ante				
Par per Total Wager	2.30%	3.50%	5.60%	7.30%
Hit Frequency	25.61%	25.61%	25.61%	25.61%