

## The Economics of Poker

*“Poker exemplifies the worst aspects of capitalism that have made our country so great” (Walter Matthau)*

Welcome to this poker lecture, the 10<sup>th</sup> in our series!, on the economics, literature & rules of poker. This document provides back-up information, including suggested further readings.

### Why should economists care?

The last fifteen or so years poker exploded into a multi-billion dollar industry, with lots of action in televised tournaments and on internet sites.<sup>♠</sup> Economists may be interested in many questions: How does the poker market work and attract so much interest? Can decision/game-theorists use poker data to test models? What can behavioral economists learn about the psychology of decision making? Can one improve one’s logical analysis (as well as have fun) by playing the game? Can poker be useful for teaching purposes?

### How can one learn more about poker?

I recommend a five-step approach: (i) Read some exciting books about life around the tables (see below). (ii) Learn poker rules. (iii) Hook up to an internet poker site and play for ‘play money’ (=låtsaspengar), which most sites allow. (iv) Buy some good text books to improve your skill (see below). (v) Enter a poker tournament at Casino Cosmopol.

### Suggest some readings!

The must read above all is Herbert O. Yardley’s *The Education of a Poker Player* from 1957. As Ian Fleming says on the cover of the paperback version, it’s “Zest, blood, sex and a tough, wry humour reminiscent of Raymond Chandler.” This book is 50-50 great poker stories from Yardley’s life and advice on poker strategy.

Al Alvarez, famous British literature critic, spent a year in Vegas in the early 80s. He wrote a wonderful book about the experience. Read it and I promise you will want to travel to Binion’s Horseshoe.... I cite from the “editorial review”:

*The Biggest Game in Town* has become a cult classic. Al Alvarez delves into the murky and compelling world of high-stakes Vegas poker, where “the next best thing to playing and winning is playing and losing”. Deftly capturing the skewed psyches and peculiar rites of professional poker players who descend every year for the World Series of Poker [WSOP] an exotic world is uncovered, a world that seems too eccentric, too amazing, too extravagant to be true.

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<sup>♠</sup> The growth of interest in poker is reflected in the participation at the \$10,000 buy-in Main Event of the World Series of Poker, a Texas No-Limit Hold’Em Freezeout tournament held yearly in Las Vegas since 1970. Seven players entered in 1970, 73 in 1980, 194 in 1990, 512 in 2000, it peaked at 8773 in 2006, and since then it fell back slightly. The winner is considered world champion. Sweden has had several strong finishers and in 2014 Martin Jacobsson from Lidingö won the whole thing, cashing a first prize of ten million dollars!

The classic on poker strategy is Doyle Brunson's *Super/System* from 1978. Doyle (who when I last played at the Bellagio sat there in his cowboy hat a table away) invited several experts to work with him on separate chapters on different versions of poker. Wow, what a great book! I especially recommend Mike Caro's chapter on 5-Card Draw and Doyle's own chapter on "The Cadillac of poker games" (=No-Limit Texas Hold'em).

An often cited and rather technical book is David Sklansky's *The Theory of Poker*. The connections to game theory are plentiful: "The Fundamental Theorem of Poker" (chapter 3) is intimately linked to the fact that poker is a zero-sum game; the discussion of "Raising as a means of cutting down opponent's odds" is in a way about backward induction; chapter 19 is called "Game Theory and Bluffing" and Sklansky is solving for (mixed) Nash equilibria.

The most popular form of poker these days is No-Limit Texas Hold'em tournaments. Note that this form of poker is not in focus in Brunson's book (*op.cit.*). Dan Harrington & Bill Robertie have recently written a truly excellent series of books, *Harrington on Hold'em*, volumes 1-3, that teach how to excel. The 'problem sets are very instructive. Harrington won the Main Event at the WSOP in 1995 and made the final tables in 2003 and 2004.

Good poker is in part based on logic and probability and in part on psychology. The just-mentioned texts focus mainly on the first part.♥ A book that focuses on the latter part is (Mike) Caro's *Book of Poker Tells* (2003). A "tell" is a "mannerism which helps you determine the secrets of an opponent's hand" (p11). The book is full of fascinating pictures, reminiscent of Darwin's *The Expression of the Emotions in Man and Animals*.

Dan Glimne's *Pokerhandboken* is very readable. Ken Lennaárd, Swedish poker champion 1999 and winner of SVT's *Riket*, comments: "innehåller allt du behöver veta för att bli en vinnande pokerspelare. Läs den flera gånger; det har jag gjort."

Denmark's Gus Hansen's book *Every Hand Revealed*, about how he won the Aussie Millions tournament, is instructive, funny, and exciting. I read it twice!

For those of you interested in the game-theoretic analysis of poker models, many famous mathematicians worked in the area including Borel, von Neumann, Nash, and Shapley. Ferguson & Ferguson (2005) (Thomas & Chris/Jesus, father & son, UCLA math professor & 2000 WSOP Main Event champ) summarize the models of Borel and of von Neumann.

### Give examples where poker was used for economists' purposes!

1. Dufwenberg (2007) comments on the "tendency for the next surge of research [in behavioral economics (BE)] to be normative, delivering advice to people, firms, or governments":

[M]any researchers seem to favor interventionist perspectives: how can government 'help' boundedly rational people who can't help themselves? ... [T]here is no logical reason why BE research has to come down that road. ... [C]onsider first the following claim: "Millions of people play poker on the internet. Billions of dollars change hands. Some people are more skillful than others, some lose money. No sensible person would go on and propose that government intervenes and puts restrictions on internet poker sites. Poker is good for you! It is fun, exciting, and sharpens the mind. A loser should go and buy himself a good textbook on poker strategy."

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♥ Though by no means exclusively so. For example, in *Super/System* some very deceptive use of language and demeanor is recommended. For colorful testimony, see pp 80-1, 88-9, 105-6, 427-8.

2. Reiley, Urbancic & Walker (2008) devise a simplified poker game which can be used in economics classes that introduce or apply game theory. I cite from their abstract:

...[the game] provides an excellent illustration of ... signaling, bluffing, mixed strategies, the value of information, and Bayes' Rule. ... We discuss ... applications ... to real-world interactions ... litigation, tax evasion, and domestic or international diplomacy. ...

3. The literature on aversion to lying has important consequences for e.g. contract theory. How model such aversion? Battigalli, Charness & Dufwenberg (2013) use chit-chat at poker to argue against a 'fixed cost of lying' (and in favor of the alternative of 'guilt aversion'):

Phil Hellmuth [2005] describes a Hold'Em game where he held  $10\heartsuit-6\heartsuit$ . He ended up not having to show his cards. Another player (Eric Seidel) said: "I thought you had a pair of 7s and a flush draw." Hellmuth's responded: "Nope, actually I had the  $10\spadesuit-J\spadesuit$ ." This is a lie of commission! One might take Hellmuth to be a type with an unusually low cost of lying. But this is not the case. He writes: "*Although I never lie outside of poker*, to me, lying about what you just had in a poker hand is part of bluffing."

4. Levitt, List & Reiley (2010) test the minimax prediction for 0-sum games using world-class poker players at the World Series of Poker in Vegas. The research question concerns whether at standard lab games, at which students fail to play minimax, poker players do better.

5. I cite from abstracts of two poker-related papers by Eil (2012) and Eil & Lien (2012):

(i) Much research has shown that risk preferences are often a function not of total lifetime wealth, but also of recent changes in wealth. A common pattern, which is predicted by prospect theory, is decreasing risk aversion following both large losses (the "break even effect") and large gains (the "house money effect"). We investigate the impact of recent profits on the risk appetite of experienced poker players, as seen through how long they decide to play and how they act when playing. ....

(ii) Reference dependence has often been found in experimental subjects. This paper uses field data from online poker games to look for [it] in player actions. Since hand values change between betting rounds ... two hands of very different strength in early betting rounds can arrive at a similar strength in a later round. However, if players form an expectation of their winnings when they first see their cards ... and use this expectation as a reference point, their actions could be different in later stages.

6. Are poker players nice guys? Becchetti, Marini & Fiaschetti (2014) provide an answer:

We wonder whether different game experiences are associated with significant differences in experimental behavior and, more specifically, whether expert bridge players, due to their habit of playing with partners and seldom for money, are more likely to adopt cooperative behavior than expert poker players. Evidence from trust games shows that bridge players make more polarized choices and choose the maximum trustor contribution significantly more often. Our findings are similar across incentivized and non-incentivized experiments and thereby support the hypothesis that behavior in simulated experiments resembles that in experiments with monetary payoffs.

## What's the ranking of poker hands?

<i>Hand</i>	<i>Structure</i>	<i>Example</i>	<i>Tiebreakers (in turn)</i>
Royal flush	AKQJT <i>suited</i>	AKQJT of ♥	none
Straight flush	$(\alpha-t)_{t=0,\dots,4}$ <i>suited</i>	JT987 of ♦	$\alpha$ [5432A is worst]
Four of a kind	$\alpha\alpha\alpha\alpha\beta$	7777Q	$\alpha, \beta$
Full house	$\alpha\alpha\alpha\beta\beta$	JJJ33	$\alpha, \beta$
Flush	$\alpha\beta\gamma\delta\epsilon$ <i>suited</i>	KT432 of ♣	$\alpha, \beta, \gamma, \delta, \epsilon$
Straight	$(\alpha-t)_{t=0,\dots,4}$	87654	$\alpha$ [5432A is worst]
Three of a kind	$\alpha\alpha\alpha\beta\gamma$	888T5	$\alpha, \beta, \gamma$
Two pair	$\alpha\alpha\beta\beta\gamma$	AA88Q	$\alpha, \beta, \gamma$
Pair	$\alpha\alpha\beta\gamma\delta$	44AK2	$\alpha, \beta, \gamma, \delta$
Other	$\alpha\beta\gamma\delta\epsilon$	A9876	$\alpha, \beta, \gamma, \delta, \epsilon$

## What are the rules?

There are many many different ways to play poker. The last part of the lecture will cover the rules of Texas No-Limit Hold'Em, and describe the format of a tournament.

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