

What is New and Old in Behavioral Finance?

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Topics to Cover

- Comments on Behavioral Finance and Efficient Markets
- A test of the Efficient Market Hypothesis in a novel domain, the NFL

Behavioral Finance: Old and New

- What is behavioral finance? Two components:
 - People—better, richer models of behavior
 - Markets—understanding limits to arbitrage
- What is “nonbehavioral” finance?
 - Only rational agents (Bayesian EU maximizers)
 - “Efficient” markets
 - Price is right
 - No free lunch

Where do we stand now?

- Price is right?
 - Macro: tech bubble? Nasdaq at 5000 and 1500?
 - Micro: Royal Dutch Shell, Palm and 3Com
 - Conclusion: prices CAN diverge from “rational” values
- So what?
 - Markets may be massively misallocating resources
 - But no one has a better way to do it.

No Free Lunch: Good News and Bad News

- Bad news for efficient markets: lots of anomalies—value, size, earnings announcements, momentum, etc.
- Good news for efficient markets: most active managers underperform.

My Conclusions

- It is easy to defend a strategy of passive investing at low fees.
- It is hard to defend a stated belief in efficient markets and active management.
- If there is a coherent approach to active management that is NOT behavioral, please tell me what it is.

Research on Investor Behavior

- What do investors do?
- Some results :
 - Individual investors are not very sophisticated.
 - In the new DC pension environment, many are saving too little and investing unwisely.
 - Even after Enron, lots invested in company stock.
- Is it possible to help?

An Approach to Policy: Libertarian Paternalism

- Paternalism: make people better off as judged by themselves
- Libertarian: do not restrict anyone's freedom.
- These goals are not mutually incompatible.

Examples of Libertarian Paternalism

- Automatic enrollment
- Save More Tomorrow
- Sensible default investment funds
- Decision making aids (e.g., Financial Engines)
- Managed accounts
- Recent pension bill helps on 401(k) plans.
- Some lessons from Sweden...

Social Security Privatization

- Most economic analyses of social security privatization concentrate on funding issues.
- Little attention is given to design features.

Swedish Social Security Privatization (AER, 2004)

- In 2000, Sweden launched a partial privatization of their social security system, similar to the proposal of President Bush.
- 2.5% payroll tax contributed to individual accounts that are self-directed

Important Design Details

1. Participants were allowed to form their own portfolios by selecting up to 5 funds from an approved list.
2. One fund was chosen (with some care) to be a “default” fund for anyone who, for whatever reason, did not make an active choice.
3. Participants were encouraged (via a massive advertising campaign) to choose their own portfolio.
4. Both balances and future contributions can be changed at any time, but unless some action is taken, the initial allocation determines future contribution flows.

Plan Details, Cont.

5. Any fund meeting certain fiduciary standards was allowed to enter the system. Thus, market entry determined the mix of funds participants could choose from. As a result of this process, there were **456 funds** to choose from.
6. Information about the funds, including fees, past performance, risk, etc., was provided in book form to all participants.
7. Funds set their own fees (except for managers included in the default fund, whose fees were negotiated).
8. Funds (except for the default fund) were permitted to advertise to attract money.

Analysis of Plan Details

- Every design choice is consistent with standard neoclassical economic principles—
 - Free entry
 - “Pro choice”
 - Market generated information transfer via advertising.
- How would libertarian paternalism work here?

The Default Fund

- For many reasons, if a fund is designated as the default fund, many participants will choose it. Some reasons include:
 - Status quo bias (Samuelson and Zeckhauser, 1988)
 - Procrastination
 - Implicit endorsement by plan designers (possibly unintended).

Possible Default Fund Options

- A. Participants are not given any choice: the default fund is the only fund offered
 - B. A default is picked, but its selection is discouraged.
 - C. A default is picked, and its selection is encouraged.
 - D. A default is picked, and its selection is neither encouraged nor discouraged.
 - E. There is no default option; participants must make an active choice or they forfeit their contributions.
- The Swedish plan designers adopted option B. and spent millions of dollars on an advertising campaign encouraging participants to choose their own portfolio.

Other Default Options

- The Swedish designers elected option B, but it is not obvious that this choice is best.
- If the plan designers think that participants will typically do well choosing for themselves, then perhaps E (forced choice-no default) should be preferred to B.
- Alternatively, if the planner thinks that participants would typically be better off with the default than with their own mix, then C (encourage the default) or even A (only the default) might be better.

Effective Lobbying for Active Choice

- The advertising campaign to encourage active choice worked. 66.9% formed their own portfolio.
- Those with more money at stake were more likely to form their own portfolio.
- Holding money at stake constant, women and younger workers were more likely to choose for themselves.

Post-launch sign-up experience

- As new participants enroll (mostly younger workers) they go through the same process, but without the ad campaign to encourage active choice.
- In the original sign-up period, 56.7% of those under 22 made an active choice, but only 8.4% of those joining in 2003 did so.

Asset Allocations in the Default Fund and Mean Selected Portfolios

	Default Fund	Mean Chosen Fund
Asset Alloc.		
Equities	90%	96.2%
Sweden	17%	48.2%
Americas	35%	23.1%
Europe	20%	18.2%
Asia	10%	6.7%
Hedge Funds	4%	0%
Private Equity	4%	0%

Other Portfolio Characteristics

	Default Fund	Mean Chosen Fund
Fixed Income	10%	3.8%
Indexed	60%	4.1%
Average Fee	0.16%	0.77%
Beta	0.98	1.01
Ex Post (3 year) Performance	-29.9%	-39.6%

Return Chasing

- The largest market share (aside from the default fund) went to *Robur Aktiefond Contura* which received 4.2 percent of the investment pool.
- This fund invested primarily in technology and health care stocks in Sweden and elsewhere.
- Its performance over the five year period leading up to the choice was 534.2 percent, the highest of the 456 funds in the pool.
- In the three years since it has lost 69.5 percent of its value.

Long Lasting Effects

- Although the initial account balances were small (average was about \$1300), the welfare costs can be large if participants do not make changes.
- In the first three years, the percentage of participants who made no changes to their portfolio during the year was 98.3 , 97.3, and 96.9 respectively.

A More General Lesson from This Experience

- Economists often think that the biases observed in psychologist and economist laboratories will be eradicated in open market settings.
- The Swedish experience reveals how just the opposite can happen. Markets and advertising reinforced individual biases:
 - Invest at home (familiarity)
 - Chase returns (extrapolation)
 - Active management (overconfidence)

Overconfidence vs. Market Efficiency in the NFL Draft

with Cade Massey

Yale SOM

Paper available on SSRN:

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=697121

Why Study the NFL Draft?

- “Real world” test of psychology
 - Evaluate robustness to strong incentives, learning and markets
- Gary Becker on psychology: “ Division of labor strongly attenuates if not eliminates any effects caused by bounded rationality. ... it doesn't matter if 90 percent of people can't do the complex analysis required to calculate probabilities. The 10 percent of people who can will end up in the jobs where it's required”

NFL Draft: Background

- Teams take turns picking college players
 - Teams select based on previous year's record -- worst record picks first
- The draft is comprised of 7 “Rounds”
 - A round consists of each team picking once
 - Currently 32 teams, so ~224 players drafted
- Selected players can only sign with the team who picks them
 - First contract typically 4-5 years
- Picks can be and are traded. Is this market rational and efficient?

Over-valuation is Over-determined

- Non-regressive Predictions
 - Likely insensitive to the amount of uncertainty
- Overconfidence
 - Might overestimate ability to discriminate between players
- Winner's Curse
 - When many parties are bidding for the same object, the “winner” often pays too much.
- False Consensus
 - Might overestimate the chance that another team will choose the player they want if they wait.

Trade Example from 2004

QB Alternatives



Getty Images

**ELI
MANNING**
Mississippi



Associated Press

**PHILIP
RIVERS**
N. Carolina State



Associated Press

**BEN
ROETHLISBERGER**
Miami of Ohio

Participants

Team:

Chargers

Giants

Browns

Draft pick:

1st

4th

7th

Giants' Trade Cost

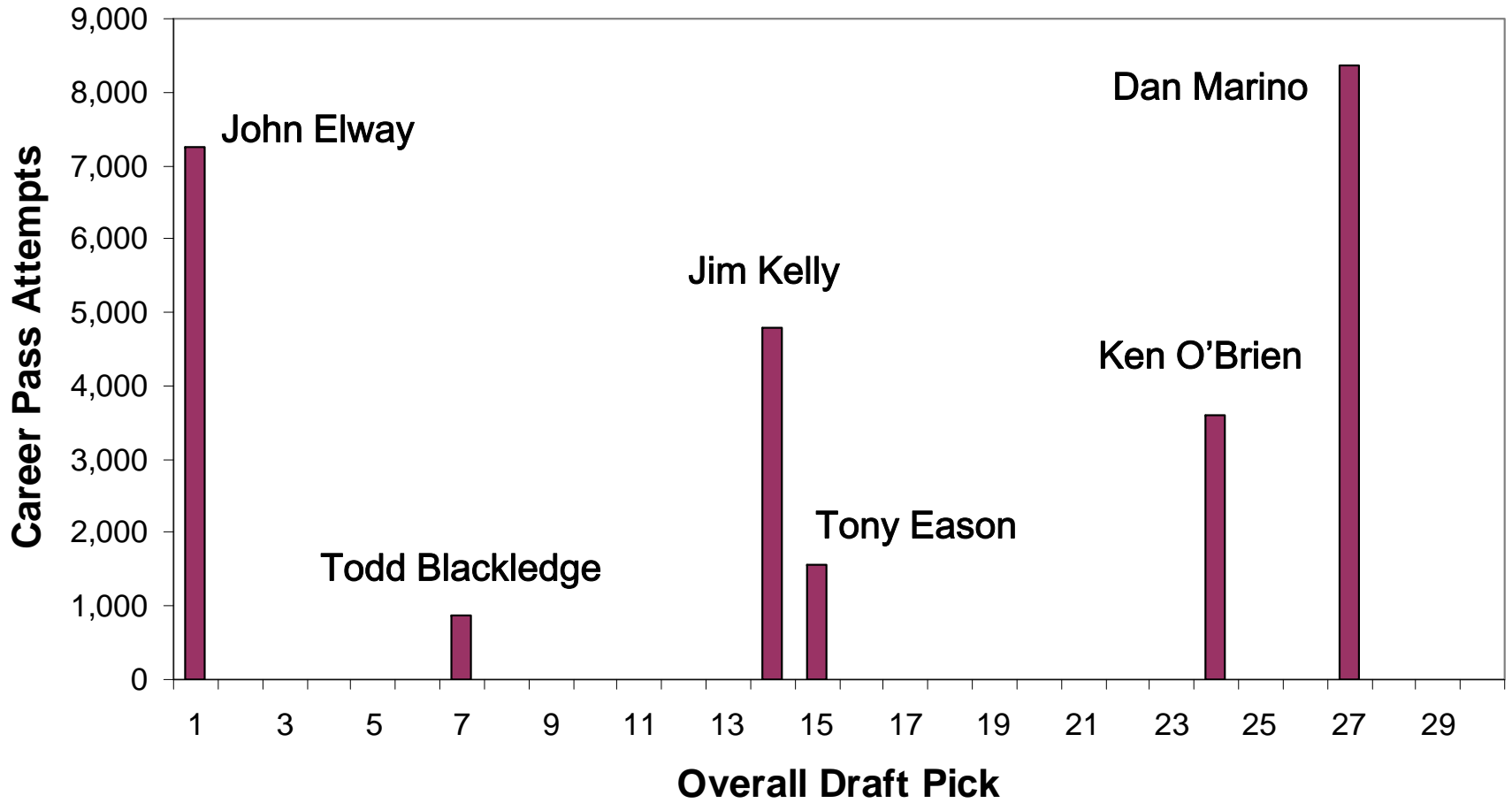
(-) 2004 3rd-rd

(-) 2005 1st-rd

(-) 2005 5th-rd

(+) 2004 2nd-rd

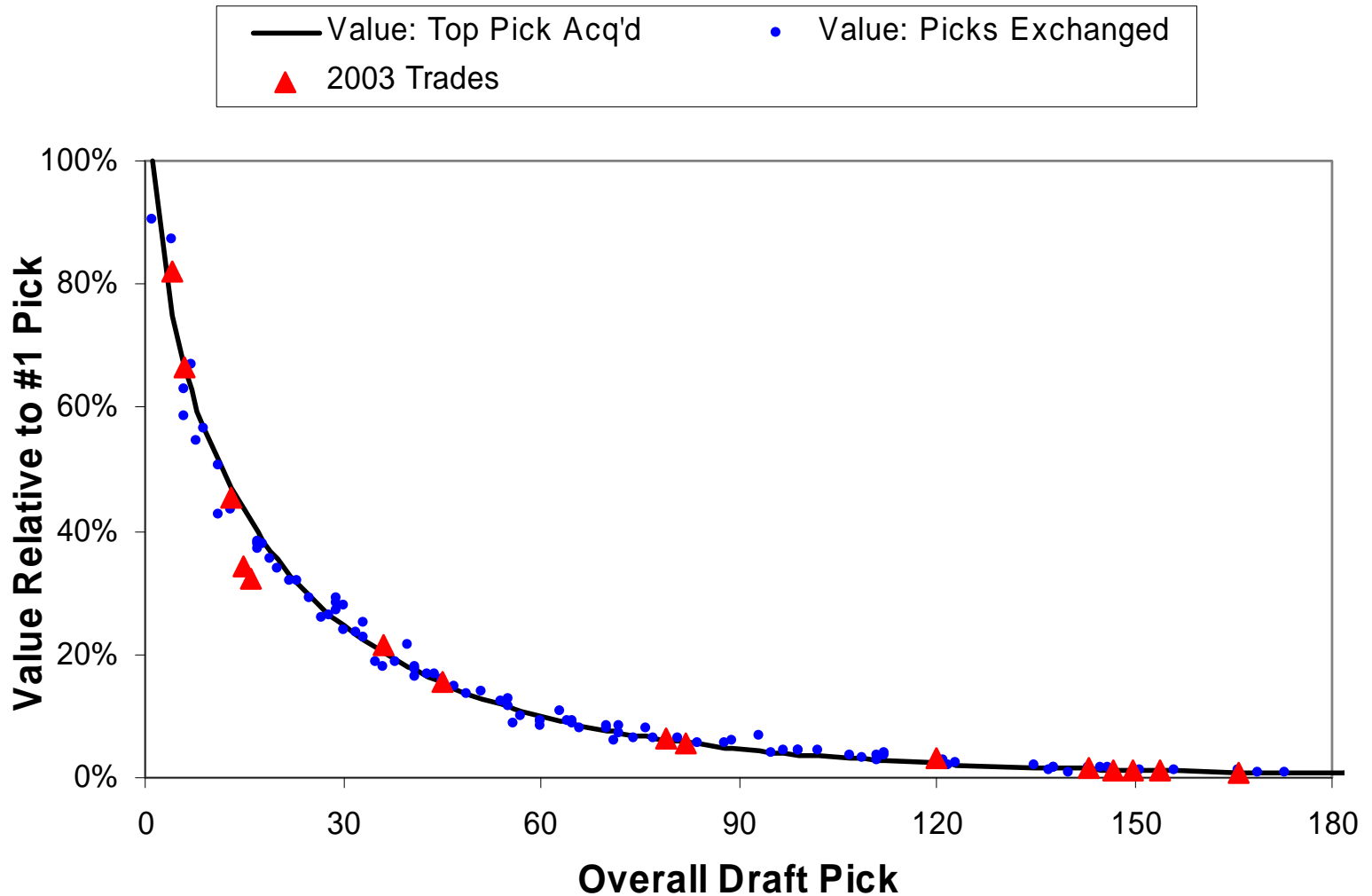
The 1983 QBs



What is the value of a draft pick?

- Data
 - Observe ~20 draft-day trades each year
 - 1988-2004: 334 trades
 - 58 also involved a player - excluded
 - 276 involved draft picks only
 - 63 also involved a future-year pick
 - 213 same-year picks only

Estimation Results: Draft-pick Value



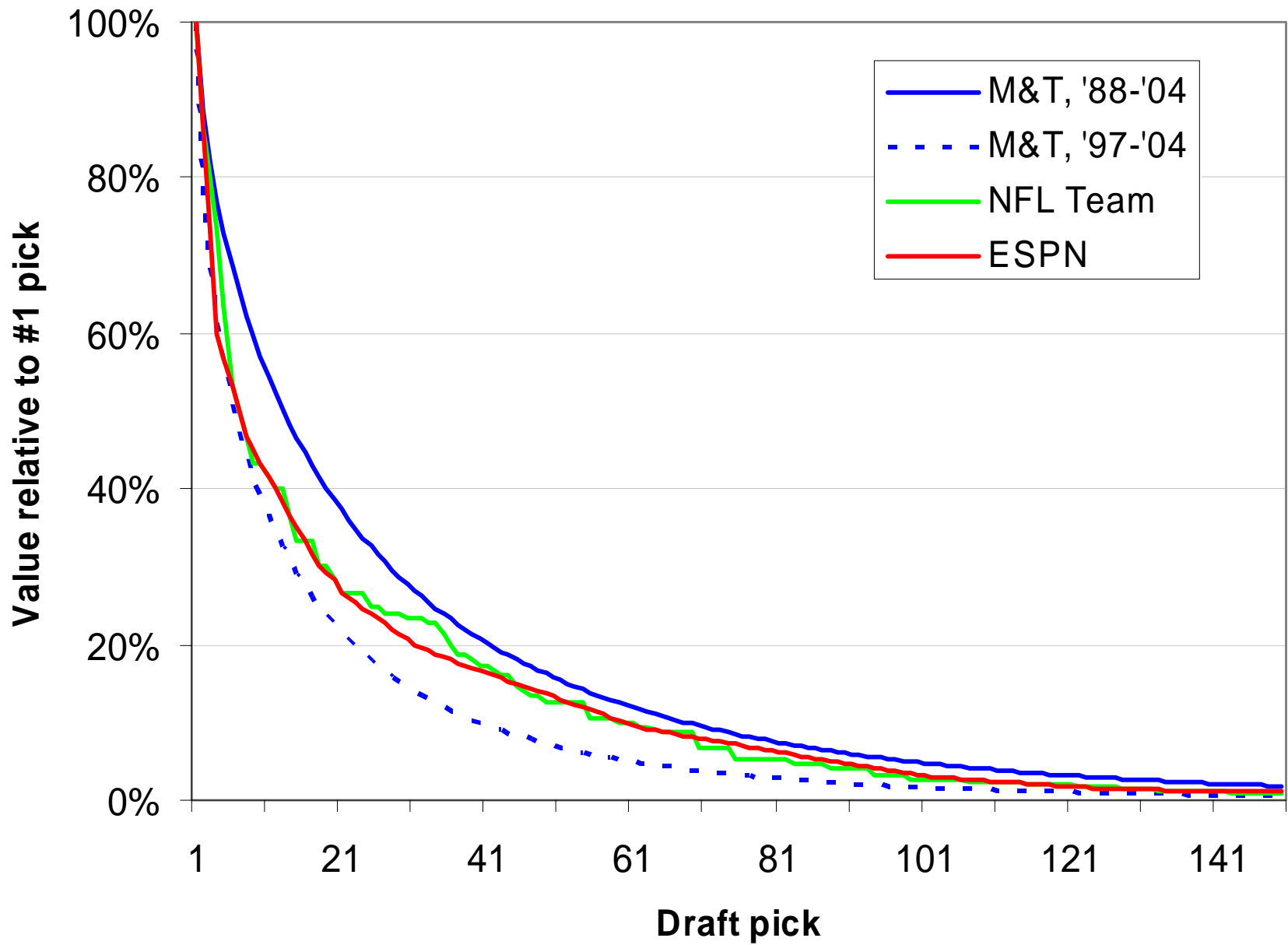
Draft Pick Value Chart

Used to Determine the Value of Traded Picks

	Round 1	Round 2		Round 3		Round 4		Round 5		Round 6		Round 7		Additional Rounds	
1	3000	33	580	65	265	97	112	129	43	161	28	193	15.2	225	2.9
2	2600	34	560	66	260	98	108	130	42	162	27.6	194	14.8	226	2.8
3	2200	35	550	67	255	99	104	131	41	163	27.2	195	14.4	227	2.7
4	1800	36	540	68	250	100	100	132	40	164	26.8	196	14	228	2.6
5	1700	37	530	69	245	101	96	133	39.5	165	26.4	197	13.6	229	2.5
6	1600	38	520	70	240	102	92	134	39	166	26	198	13.2	230	2.4
7	1500	39	510	71	235	103	88	135	38.5	167	25.6	199	12.8	231	2.3
8	1400	40	500	72	230	104	86	136	38	168	25.2	200	12.4	232	2.2
9	1350	41	490	73	225	105	84	137	37.5	169	24.8	201	12	233	2.1
10	1300	42	480	74	220	106	82	138	37	170	24.4	202	11.6	234	2
11	1250	43	470	75	215	107	80	139	36.5	171	24	203	11.2	235	1.9
12	1200	44	460	76	210	108	78	140	36	172	23.6	204	10.8	236	1.8
13	1150	45	450	77	205	109	76	141	35.5	173	23.2	205	10.4	237	1.7
14	1100	46	440	78	200	110	74	142	35	174	22.8	206	10	238	1.6
15	1050	47	430	79	195	111	72	143	34.5	175	22.4	207	9.6	239	1.5
16	1000	48	420	80	190	112	70	144	34	176	22	208	9.2	240	1.4
17	950	49	410	81	185	113	68	145	33.5	177	21.6	209	8.8	241	1.3
18	900	50	400	82	180	114	66	146	33	178	21.2	210	8.4	242	1.2
19	875	51	390	83	175	115	64	147	32.6	179	20.8	211	8	243	1.1
20	850	52	380	84	170	116	62	148	32.2	180	20.4	212	7.6	244	1
21	800	53	370	85	165	117	60	149	31.8	181	20	213	7.2	245	0.95
22	780	54	360	86	160	118	58	150	31.4	182	19.6	214	6.8	246	0.9
23	760	55	350	87	155	119	56	151	31	183	19.2	215	6.4	247	0.85
24	740	56	340	88	150	120	54	152	31.6	184	18.8	216	6	248	0.8
25	720	57	330	89	145	121	52	153	31.2	185	18.4	217	5.6	249	0.75
26	700	58	320	90	140	122	50	154	30.8	186	18	218	5.2	250	0.7
27	680	59	310	91	136	123	49	155	30.4	187	17.6	219	4.8	251	0.65
28	660	60	300	92	132	124	48	156	30	188	17.2	220	4.4	252	0.6
29	640	61	292	93	128	125	47	157	29.6	189	16.8	221	4	253	0.55
30	620	62	284	94	124	126	46	158	29.2	190	16.4	222	3.6	254	0.5
31	600	63	276	95	120	127	45	159	28.8	191	16	223	3.3	255	0.45
32	590	64	270	96	116	128	44	160	28.4	192	15.6	224	3	256	0.4

Provided by www.footballcorner.bizland.com

This value chart was not obtained from any NFL team.



Quick Aside: Implied Discount Rate

Discount rate required to equate the value of the middle pick in two adjacent rounds:

- More complete estimation, including trades with future picks (n=276)
 - Value curve is essentially identical
 - Implied discount rate is 174%
- Strong pattern observed: Round $n(t) =$ Round $n-1(t+1)$

Round	Value	r
1	0.362	n/a
2	0.107	239%
3	0.041	162%
4	0.017	133%
5	0.008	117%
6	0.004	106%
7	0.002	98%

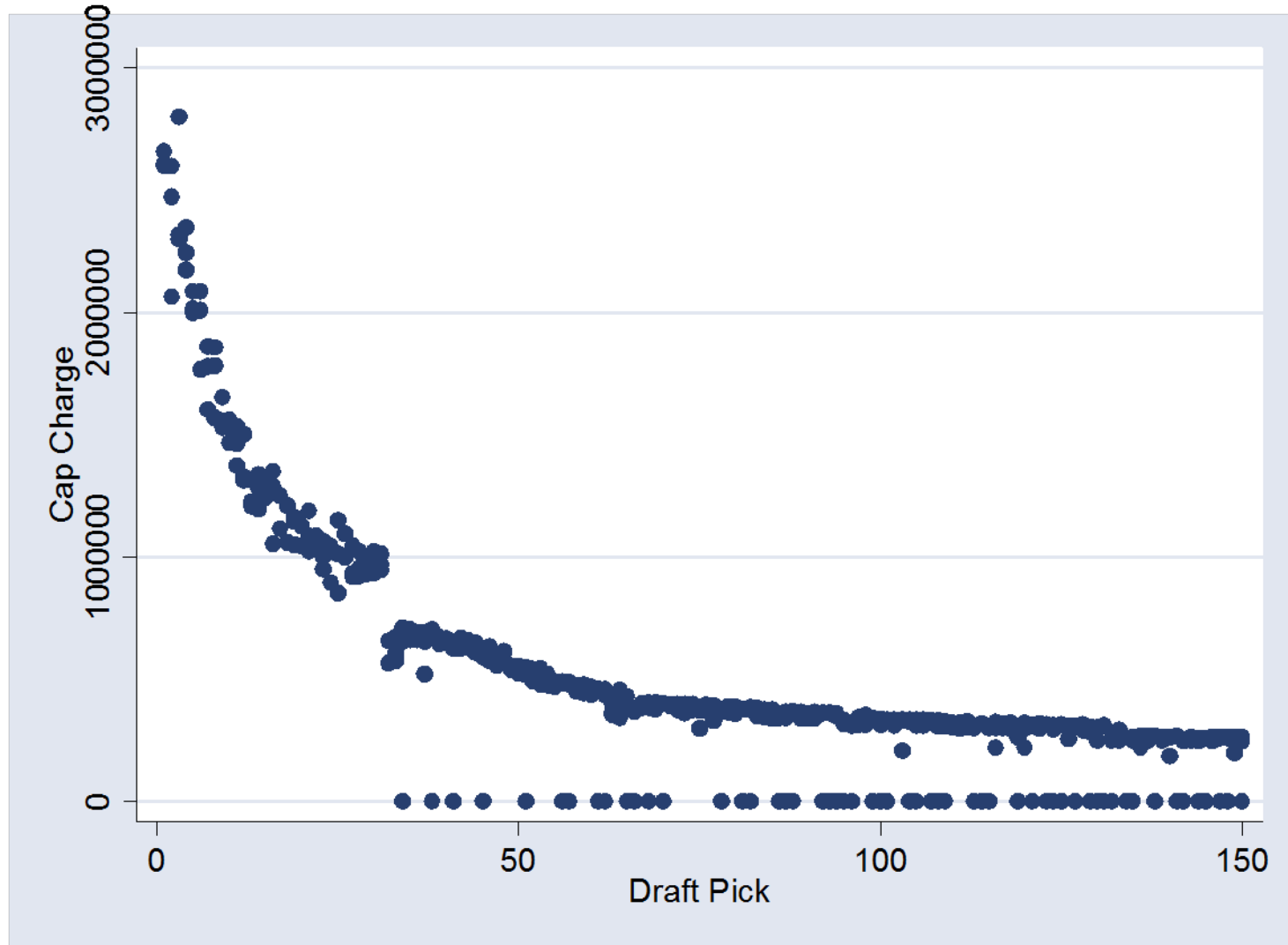
Conclusions So Far

- Early picks are very highly valued:
- $\#1 = \#10 + \#11 = \#29 + \#30 + \#31 + \#32$
- Next question: how much do you have to pay various picks?

Some Facts about the Salary Cap

- Teams are limited in how much they can pay their players. This “salary cap” is binding for most teams in most years.
- The cap charge in a year is equal to salary for that year plus pro-rated bonuses.
- In addition there is a “rookie” salary cap—the total amount that can be paid to new players. This is a “cap within a cap”.
- The team’s rookie allocation depends on their draft picks and serves as a bargaining focal point.

1st-year Compensation by draft order



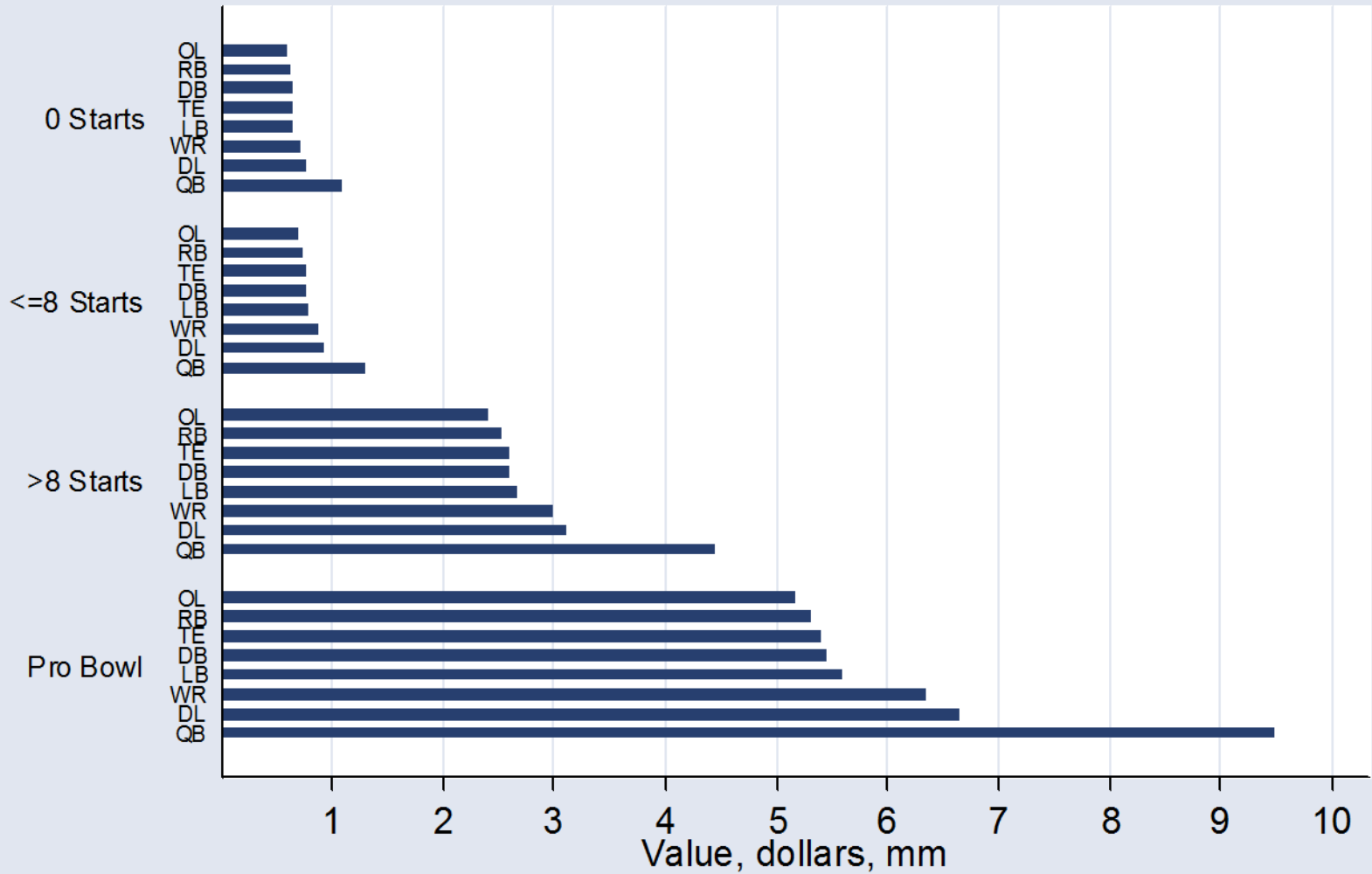
Valuing Performance

- How do teams value players?
- We use free agent (free market) compensation as our measure of value
 - We assume teams optimize subject to the salary cap
 - Relative compensation across players should reflect their relative value to the team
 - We use 6th year contracts to be sure that all players are in at least their second contract.
 - Since performance data are only available for a few “skill” positions such as QB, RB, and WR, we just use categories: reserve, starter, pro bowl, etc.

Cost-Benefit Analysis

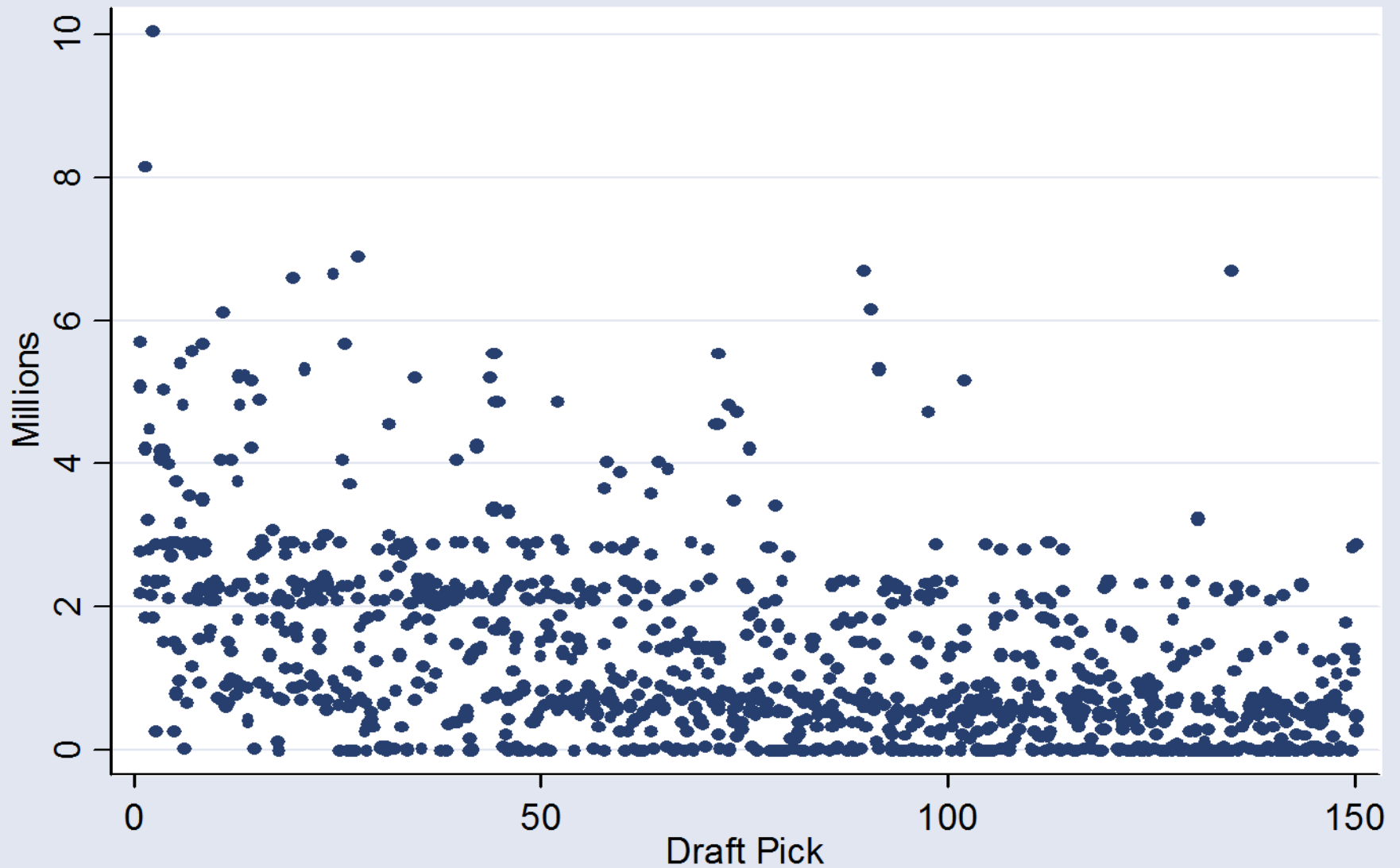
- For each player drafted, we know:
 - When they were drafted.
 - How much they were paid in each year.
 - Their categorical performance.
- We can then calculate a “surplus” to the team for each player selected, that is performance value minus compensation paid.
- We can then ask how surplus varies with draft order.

Estimated Value by Performance and Position



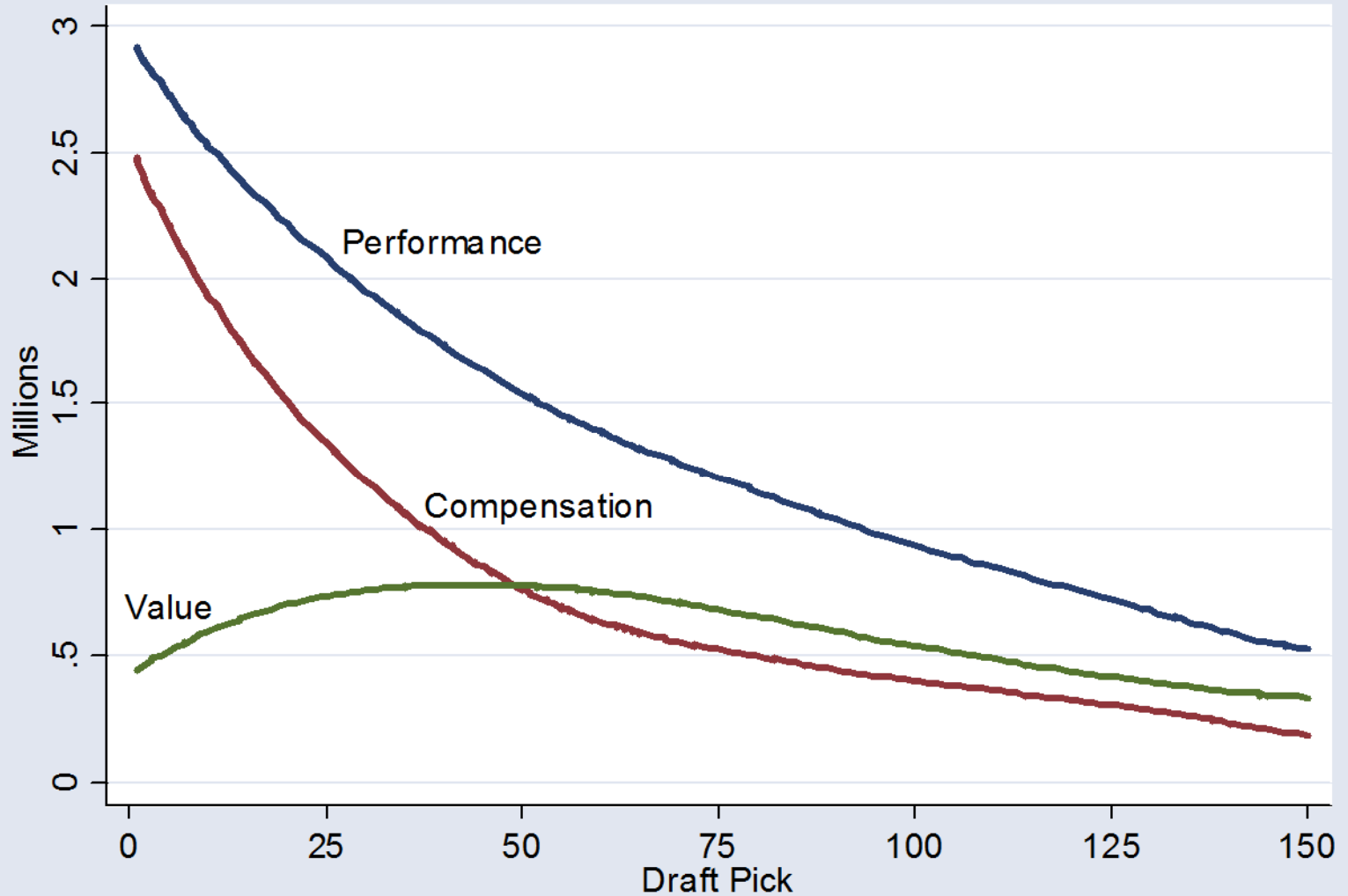
Average estimates from 4 models of 6th-year compensation, Table 7.

Performance Value, Mean, Yrs 1-5



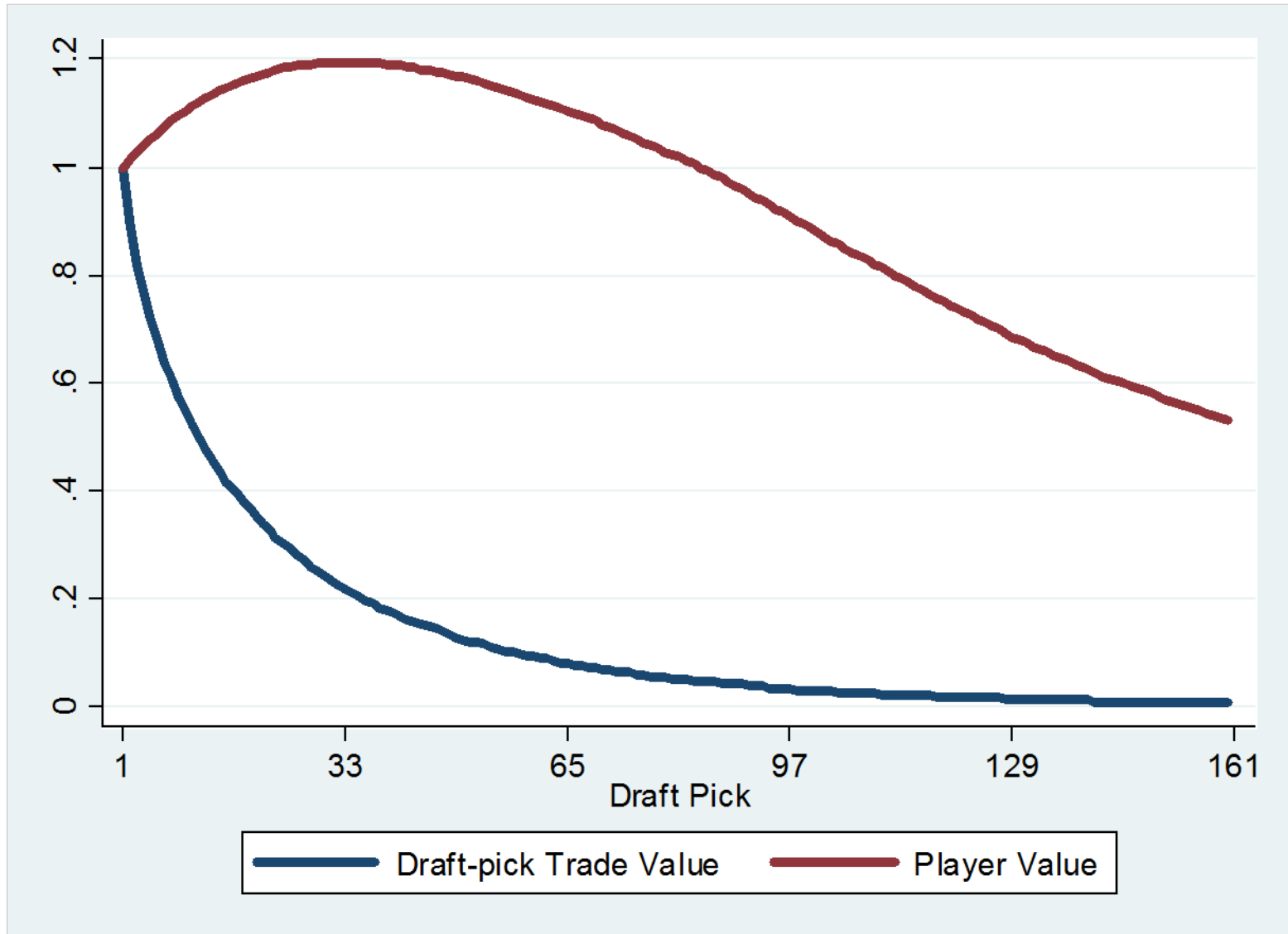
Estimation based on cap charges 2000-2002. Minimal spherical noise added.

Player Value by Draft Order



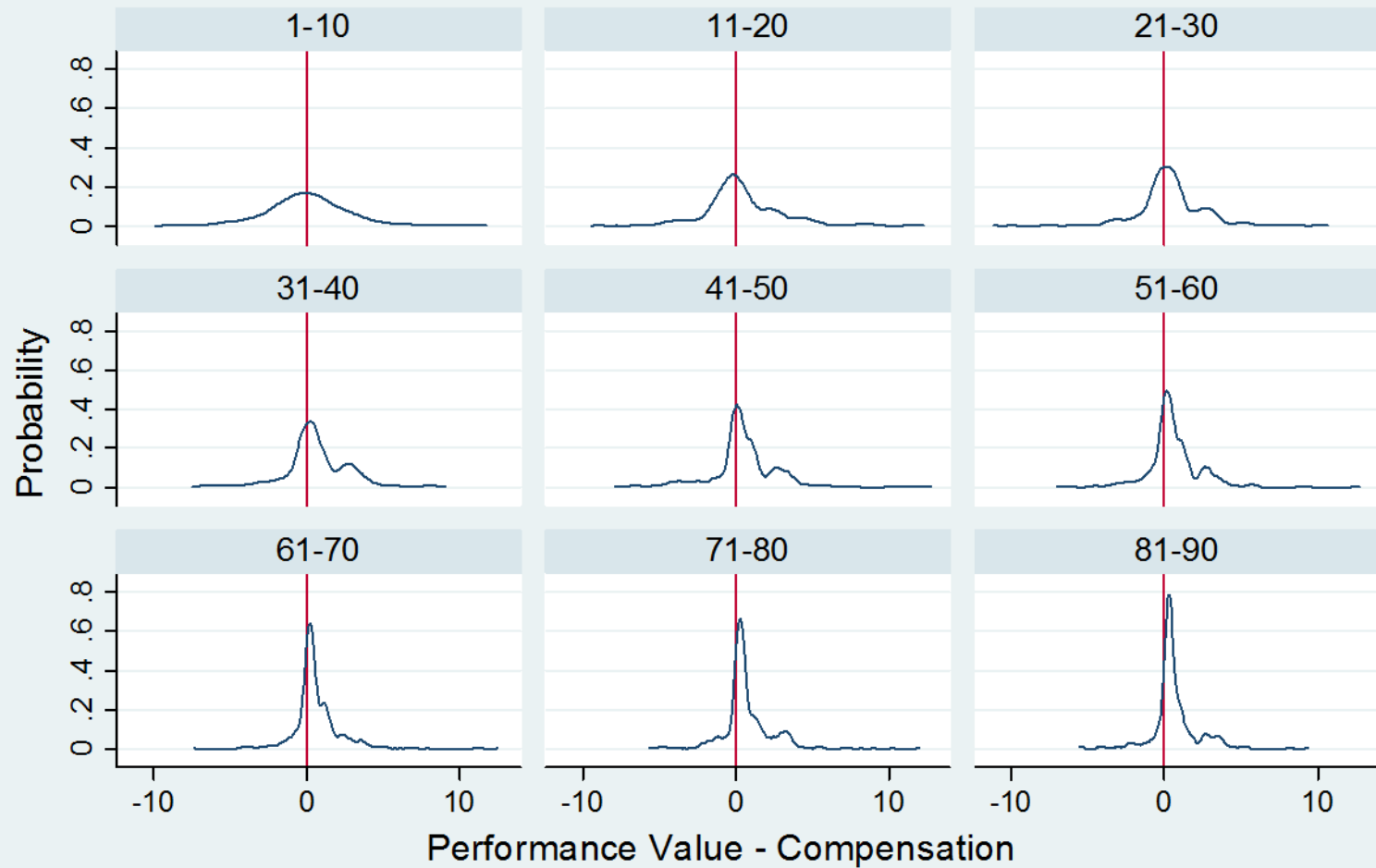
Lowess curves. Based on cap charges, 2000-2002.

Estimated Value vs. #1 Pick



Which investment do you want?

Surplus, 1st 5 Years, by Draft Pick



Graphs by bin10

Key Findings

- We find the support for our over-valuation hypothesis even stronger than expected
 - Draft-pick values are well behaved and steeply declining.
 - Initial compensation closely follows draft-pick values, exacerbating the cost of high draft picks.
 - Performance value declines with draft pick but much more gradually.
 - Hence: Player value (performance value less compensation) increases with draft order in the 1st round!
- Inter-temporal preferences are also difficult to rationalize
 - The discount rate implied by multi-year trades is >100%.

Robustness checks

- Using performance data on ball carrying positions we can compute a “yards/dollar” productivity measure. This is upward sloping in the first round.
- Similar results for “non-skill” positions, that all excluding QBs, RBs and WRs.
- Alternative explanations consistent with rationality (e.g., firms are maximizing profits, not wins) do not seem to fit the data.

Market Efficiency?

- The market value for picks implies that the first pick is worth six times the value of the 40th pick.
- In fact, it is worth less than the 40th pick!
- How can the market get this so wrong?
- No arbitrage possible.
 - Teams cannot sell early picks short.
 - We cannot sell dumb teams short.
- Our only profit opportunity is to buy a “dumb” team, but, even if we had the \$1 billion, we may be out bid by someone less rational.

Conclusions

- Markets plus big stakes are not enough to eliminate decision making biases.
- This is an easy market to calibrate because performance is observable, even for employees hired by others. Is there any reason to think that the market for CEOs is more efficient?
- Or the market for hedge-fund managers?
- Or professors?