BASEBALL PLAYERS LABOR MARKET

Coase Theorem.

In the absence of significant transactions cost (few parties), any asset (talent) will be used in its most efficient manner (highest marginal revenue product), regardless of ownership (reserve/transfer system or free agency.)

Invariance proposition.

"A market in which freedom is limited by a reserve rule…distributes players about as a free market would."

"No matter who owns the right to sell the contract for the services of a baseball player, the distribution of players among teams will remain the same."

Yankee Paradox.

Self-defeating dominance of the league would be internalized by the large market club.

Exploitation.

If competitive balance is unaffected by ownership then the only purpose of the reserve rule and other limitations of the labor market is to transfer rent from players to owners.

Player development expense PDX.

If teams cannot recover player development costs, then the player development system in the minor leagues would cease to exist and the quality of play will be reduced. Players are exploited to the extent that they are paid less than their marginal revenue product after player development expenses.

Marginal revenue product.

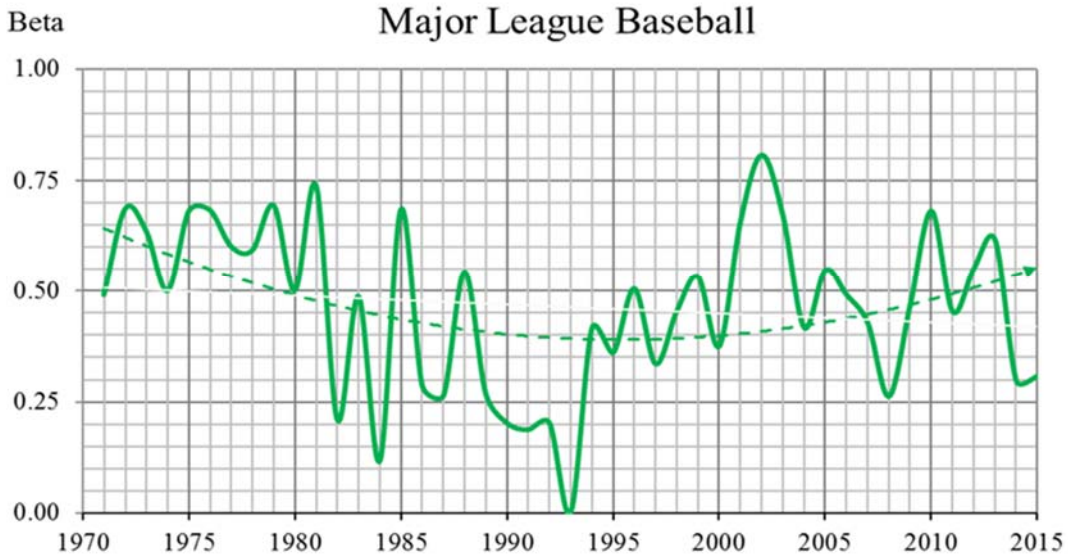
In a competitive market a player will be paid the value of his marginal revenue product. The marginal revenue product of talent is equal to the marginal product of talent multiplied by a team's marginal revenue of winning. In a monopsony market a players salary will approach his opportunity cost (reservation wage) at the limit.

Strong form invariance.

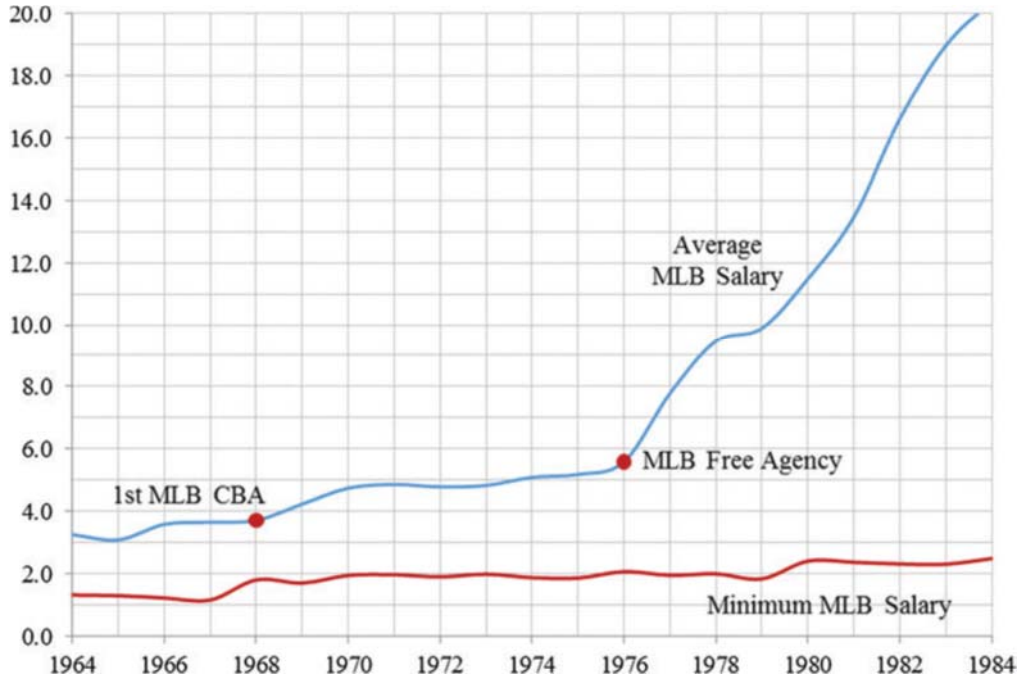
The distribution of playing talent will not be affected by any rules limiting labor market mobility. These rules (player draft, roster limits, salary caps, revenue sharing) serve only to exploit playing talent by depressing wages.

How to break up the Yankees.

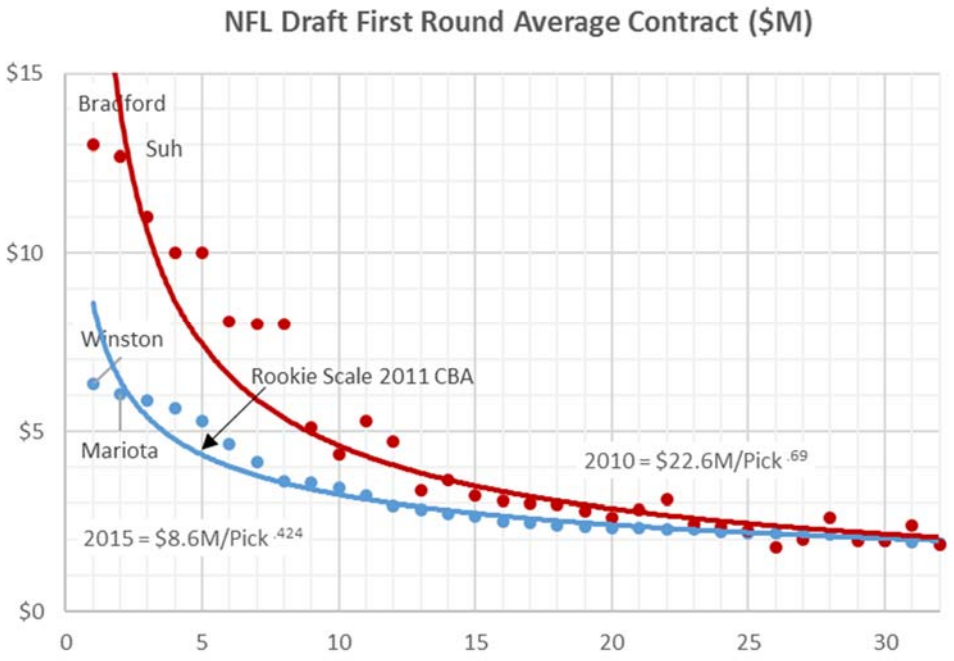
The only solution is to increase competition (reduce monopoly power) in the product market where the large market club enjoys its revenue advantage. This solution uses the power of competition in the product market rather than further limiting competition in the labor market (by *increasing* monopsony power).

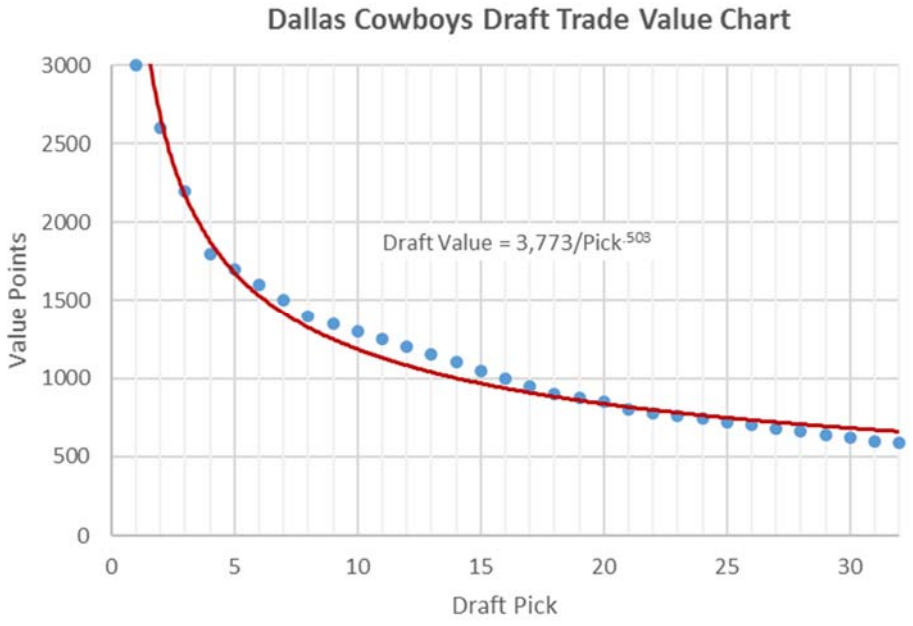


Competitive Balance before and after Free Agency in 1976



MLB Player Salaries before and after Free Agency in 1976





$$APY = \frac{Y_1}{\sqrt{Pick}}$$

ζ Analysis of Titans-Rams Trade 2016

TITANS GET				L.A. RAMS GET			
Year	**Round**	**Overall pick**	**ζ Value**	**Year**	**Round**	**Overall pick**	**ζ Value**
2016	1	15	0.258	2016	1	1	1.000
2016	2	43	0.152	2016	4	113	0.094
2016	2	45	0.149	2016	6	177	0.075
2016	3	76	0.115				
2017	1	15	0.232				
2017	3	47	0.131				
Total Value of Trade			**1.038**				**1.169**

Source: John Vrooman; subsequent picks discounted @ 10%

The RGIII Trade 2012

ST. LOUIS RAMS GET				WASHINGTON REDSKINS GET			
Year	**Round**	**Overall pick**	**ζ Value**	**Year**	**Round**	**Overall pick**	**ζ Value**
2012	1	14	0.267	2012	1	2	0.707
2012	2	39	0.160				
2012	2	50	0.141				
2012	5	150	0.082				
2013	1	30	0.164				
2013	3	92	0.094				
2013	5	160	0.071				
2014	1	2	0.573				
Total Value of Trade			**1.553**				**0.707**

Source: John Vrooman; subsequent picks discounted @ 10%

CC

How to determine the marginal revenue product of talent MRP.

$$\pi_1 = R_1 - C_1$$

$$\pi_1 = R_1 [m_1 , w_1(t_1 , t_2)] - ct_1$$

$$MRP_1 = (\partial R_1/\partial t_1) = (\partial R_1/\partial w_1)(\partial w_1/\partial t_1) = MR_1 \, MP_1 = c$$

π_1 = *profit for team 1*

R_1 = *team revenue which is a function of market size* m_1 *and win percent* w_1

$w_1 = w (t_1)$ = *win percent which is a function of relative talent* $w_1 = t_1 /(t_1 + t_2)$

$C_1 = ct_1$ = *payroll where c = cost per unit of talent*

$MRP_1 = MR_1 \, MP_1$

MRP is the product of the marginal revenue of a win MR and the marginal product of talent MP where both are assumed to have diminishing marginal returns.

MRP AMBIGUITY AND PLAYER MOVEMENT

MRP=MR*MP	MID-MARKET LOW MR	LARGE MARKET HIGH MR
GOOD TEAM LOW MP	HOUSTON ASTROS 04 (CARLOS BELTRAN WAR=4.5)	NY YANKEES 13 (ROBINSON CANO WAR =5.0)
		NY YANKEES 04 (ALEX RODRIGUEZ WAR=5.3)
BAD TEAM HIGH MP	SEATTLE MARINERS 14 (ROBINSON CANO WAR =6.4)	NY METS 05 (CARLOS BELTRAN WAR=4.4)
	TEXAS RANGERS 03 (ALEX RODRIGUEZ WAR = 8.5)	

MAJOR LEAGUE BASEBALL SELECTED PLAYER CONTRACTS

JOSH HAMILTON: 5 years / $125M (2013-17)

Year	Age	Team	G	Salary	WAR	$M / WAR
2007	26	Cincinnati Reds	90	$380,000	2.5	$0.15
2008	27	Texas Rangers	156	$396,830	5.4	$0.07
2009	28	Texas Rangers	89	$555,000	0.6	$0.93
2010	29	Texas Rangers	133	$3,250,000	8.7	$0.37
2011	30	Texas Rangers	121	$8,750,000	3.7	$2.36
2012	31	Texas Rangers	148	$13,750,000	3.9	$3.53
2013	32	Los Angeles Angels	151	$17,000,000	1.5	$11.33
2014	33	Los Angeles Angels	89	$17,000,000	1.4	$12.14
2015	34	Los Angeles Angels	39	$25,400,000	$20,710,000	
2016	35	Texas Rangers		$28,410,000	$26,410,000	
2017	36	Texas Rangers		$28,410,000	$26,410,000	

CARLOS BELTRAN: 3 years / $45M (2014-16)

Year	Age	Team	G	Salary	WAR	$M / WAR
1998	21	Kansas City Royals	14	$170,000	0.3	$0.57
1999	22	Kansas City Royals	156	$200,000	4.7	$0.04
2000	23	Kansas City Royals	98	$350,000	0.8	$0.44
2001	24	Kansas City Royals	155	$425,000	6.4	$0.07
2002	25	Kansas City Royals	162	$3,500,000	4.3	$0.81
2003	26	Kansas City Royals	141	$6,000,000	5.8	$1.03
2004	27	Kansas City Royals	69	$9,000,000	2.3	$1.32
2004		HOU:Trade	90		4.5	$1.32
2005	28	New York Mets	151	$11,571,429	2.9	$3.99
2006	29	New York Mets	140	$13,571,428	8.2	$1.66
2007	30	New York Mets	144	$13,571,429	5.4	$2.51
2008	31	New York Mets	161	$18,622,809	6.9	$2.70
2009	32	New York Mets	81	$19,243,682	3.6	$5.35
2010	33	New York Mets	64	$19,401,569	0.7	$27.72
2011	34	New York Mets	98	$19,325,436	3.6	$4.20
2011		SFG:Trade	44		1.0	$4.20
2012	35	St. Louis Cardinals	151	$13,000,000	3.9	$3.33
2013	36	St. Louis Cardinals	145	$13,000,000	2.4	$5.42
2014	37	New York Yankees	109	$15,000,000	-0.2	-$75.00
2015	38	New York Yankees		$15,000,000	0.8	$18.75
2016	39	New York Yankees		$15,000,000		

CLAYTON KERSHAW: 7 years / $215M (2014-20)

Year	Age	Team	G	Salary	WAR	$M / WAR
2008	20	Los Angeles Dodgers	22	$390,000	1.4	$0.28
2009	21	Los Angeles Dodgers	31	$404,000	4.7	$0.09
2010	22	Los Angeles Dodgers	32	$440,000	5.5	$0.08
2011	23	Los Angeles Dodgers	33	$500,000	6.5	$0.08
2012	24	Los Angeles Dodgers	33	$8,000,000	6.2	$1.29
2013	25	Los Angeles Dodgers	33	$11,000,000	7.8	$1.41
2014	26	Los Angeles Dodgers	27	$22,000,000	7.5	$2.93
2015	27	Los Angeles Dodgers		$30,000,000	6.3	$3.49
2016	28	Los Angeles Dodgers		$32,000,000		
2017	29	Los Angeles Dodgers		$33,000,000		
2018	30	Los Angeles Dodgers		$33,000,000	Player option	
2019	31	Los Angeles Dodgers		$32,000,000		
2020	32	Los Angeles Dodgers		$33,000,000		

MIKE TROUT: 6 years / $144.5M (2015-20)

Year	Age	Team	G	Salary	WAR	$M / WAR
2011	19	Los Angeles Angels	40	$414,000	0.7	$0.59
2012	20	Los Angeles Angels	139	$480,000	10.8	$0.04
2013	21	Los Angeles Angels	157	$510,000	8.9	$0.06
2014	22	Los Angeles Angels	157	$1,000,000	7.9	$0.13
2015	23	Los Angeles Angels		$5,250,000	7.5	$0.70
2016	24	Los Angeles Angels		$15,250,000		
2017	25	Los Angeles Angels		$19,250,000		
2018	26	Los Angeles Angels		$33,250,000		
2019	27	Los Angeles Angels		$33,250,000		
2020	28	Los Angeles Angels		$33,250,000		

CC SABATHIA: 5 years / $122M (2012-16), plus 2017 option

Year	Age	Team	G	Salary	WAR	$M / WAR
2001	20	Cleveland Indians	33	$200,000	2.9	$0.07
2002	21	Cleveland Indians	33	$700,000	3.2	$0.22
2003	22	Cleveland Indians	30	$1,100,000	3.7	$0.30
2004	23	Cleveland Indians	30	$2,700,000	3	$0.90
2005	24	Cleveland Indians	31	$5,250,000	1.8	$2.92
2006	25	Cleveland Indians	28	$7,000,000	4.6	$1.52
2007	26	Cleveland Indians	34	$8,750,000	6.3	$1.39
2008	27	Cleveland Indians	18	$11,000,000	1.9	$1.62
2008		MIL:Trade	17		4.9	$1.62
2009	28	New York Yankees	34	$15,285,714	6.2	$2.47
2010	29	New York Yankees	34	$24,285,714	4.6	$5.28
2011	30	New York Yankees	33	$24,285,714	7.5	$3.24
2012	31	New York Yankees	28	$23,000,000	3.5	$6.57
2013	32	New York Yankees	32	$23,000,000	0.3	$76.67
2014	33	New York Yankees	8	$23,000,000	-0.6	-$38.33
2015	34	New York Yankees		$23,000,000	0.3	$76.67
2016	35	New York Yankees		$25,000,000		
2017	36	New York Yankees		$25,000,000		

BUSTER POSEY: 9 years / $167M (2013-21), plus 2022 team option

Year	Age	Team	G	Salary	WAR	$M / WAR
2009	22	San Francisco Giants	7	$400,000	-0.1	-$4.00
2010	23	San Francisco Giants	108	$400,000	3.9	$0.10
2011	24	San Francisco Giants	45	$575,000	1.4	$0.41
2012	25	San Francisco Giants	148	$615,000	7.3	$0.08
2013	26	San Francisco Giants	148	$8,000,000	4.9	$1.63
2014	27	San Francisco Giants	147	$12,500,000	5.3	$2.36
2015	28	San Francisco Giants		$16,500,000	5.4	$3.06
2016	29	San Francisco Giants		$20,000,000		
2017	30	San Francisco Giants		$21,400,000		
2018	31	San Francisco Giants		$21,400,000		
2019	32	San Francisco Giants		$21,400,000		
2020	33	San Francisco Giants		$21,400,000		
2021	34	San Francisco Giants		$21,400,000		
2022	35	San Francisco Giants		$22,000,000	Team option ($3M)	

Vrooman Salary Analysis: C.C. Sabathia 2008

Base salary	$9 million
Cy Young Raise	$2 million
Total Salary 2008	$11 million

2008 Season	W-L	ERA	IP	Split %	Traded Games	July 7 2008 Split %
Cleveland AL	6-8	3.83	122	48.6%	89	54.9%
Milwaukee NL	11-2	1.65	130	51.4%	73	45.1%
2008 Total	17-10	2.70	253	100.0%	162	100.0%

Brewers Win %	W-L	2008
With Sabathia	90-72	0.556
Without Sabathia	79-70	0.530
Extra Win %		0.026

Milwaukee Estimated Attendance Multiple since 1998 (NL) = 5 million * win%
Brewers extra attendance from Sabathia: ATT = 129,220 = 5 million * .026

Brewers 2008 total revenue multiple per fan = $60 (guesstimate): VTS = 34%
Brewers 2008 local revenue multiple per fan = $40 (total revenue - VTS)

Brewers 2008 Attendance = 3,068,458
Brewers Total Revenue Estimate = $184.1 million
Brewers Local Revenue Estimate = $122.7 million

Did the Brewers get their money's worth from CC Sabathia in 2008? YES and then some

2008 Extra local revenue for Brewers from Sabathia = $5.17 million ($40 * 129,220)
2008 Salary split paid by Brewers: $5.0 million (45.1% * $11 million)
2008 MRP Salary for Sabathia in Milwaukee = $11.5 million ($5.17/.451)

Should the Brewers compete with the Yankees for CC? NO the game is too rich.

Estimated total revenue multiple in New York is $120 per fan or $80 per fan net HTS.
The 2009 MRP salary for Sabathia in New York City is 2X Milwaukee = $23 million.

Would revenue sharing make the Brewers more competitive with the Bombers? NO revenue sharing would not change the relative revenue advantage of NYC.

If the VTS was doubled to 68% then Sabathia's salary would be proportionately cut in half in both Milwaukee and NYC but his relative MRP of 2:1 would not change.

In this case CC would still move to the Yankees except his salary would also be cut in half to $11.5 million in NYC compared to $5.75 million for the Brewers. All the Yankees needed to offer was a salary just above the next highest offer.

What would happen without revenue sharing? CC would then be paid his full MRP but he would still go to the Bombers.

If revenue sharing was eliminated then CC's MRP in NYC would jump to $31.2 million compared to $15.6 million in Milwaukee, but the MRP ratio would remain 2:1 in favor of NYC.

In the land of the bottom line, CC Sabathia is a "gone pecan" regardless of revenue sharing and the only effect of more revenue sharing is to lower CC's relative salary for all clubs by the VTS (visiting-team share).

Milwaukee Journal-Sentinel interview with John Vrooman, Vanderbilt University

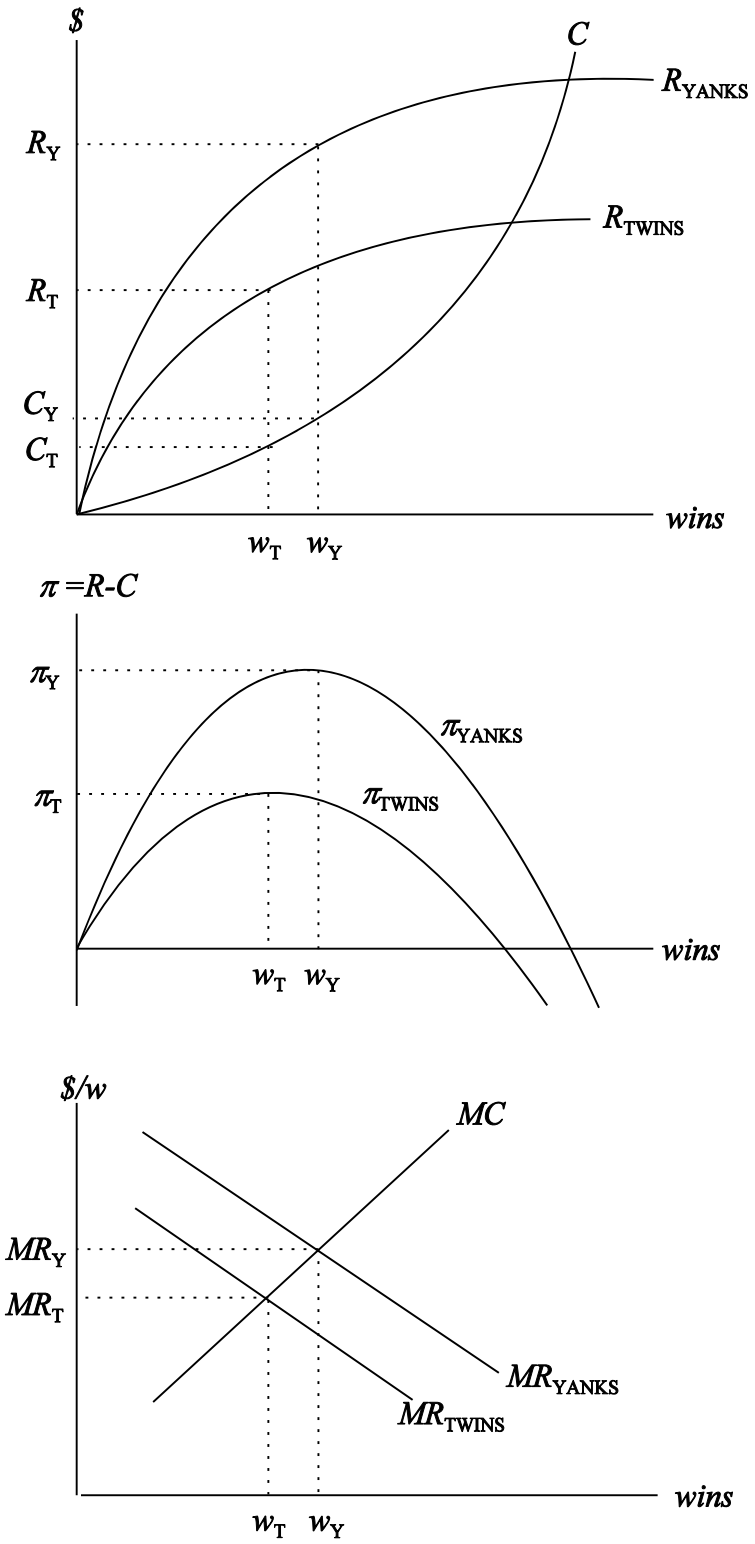
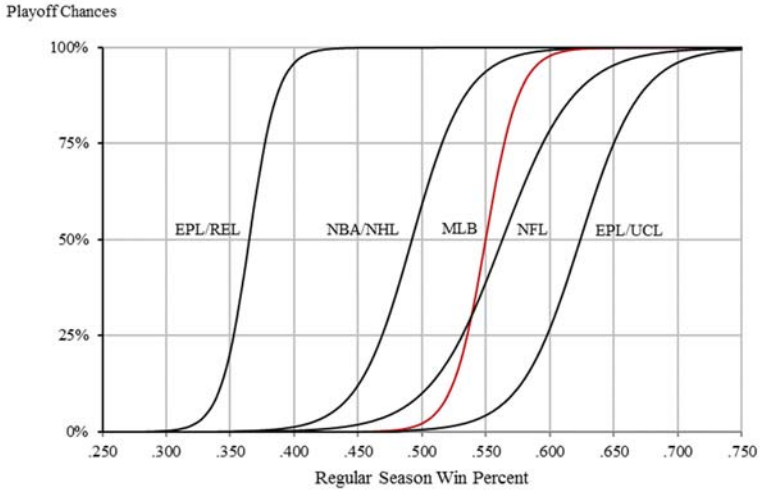
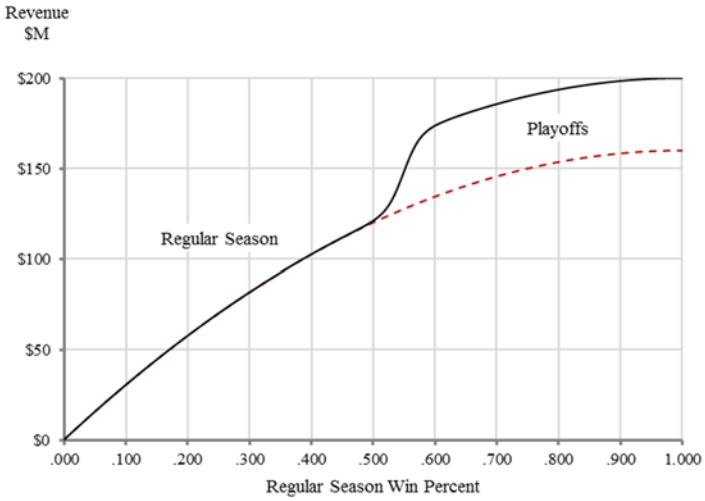
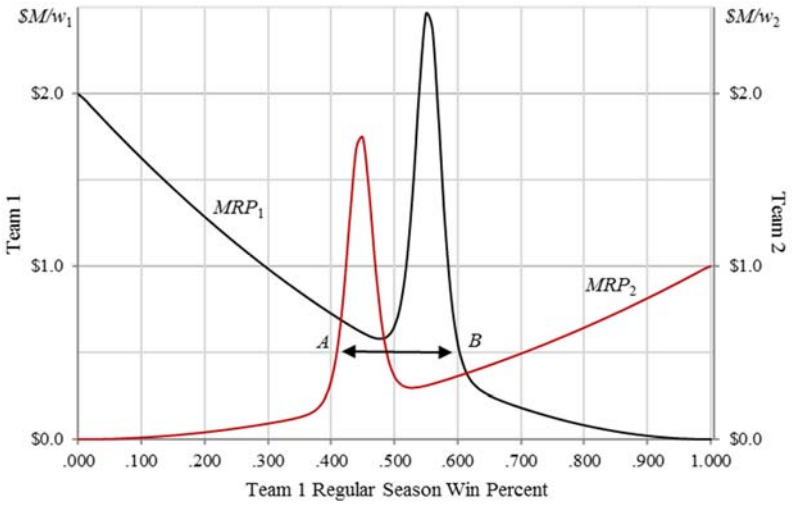


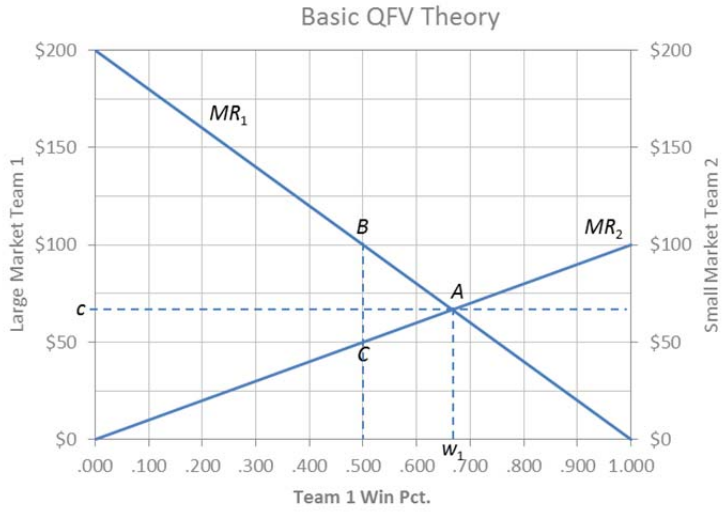
Figure 1. Unconstrained Yankee Dominance

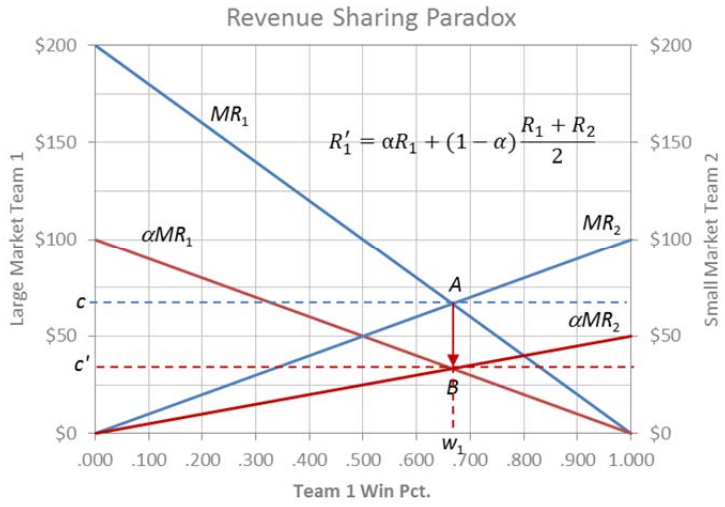
CHAMPION EFFECT

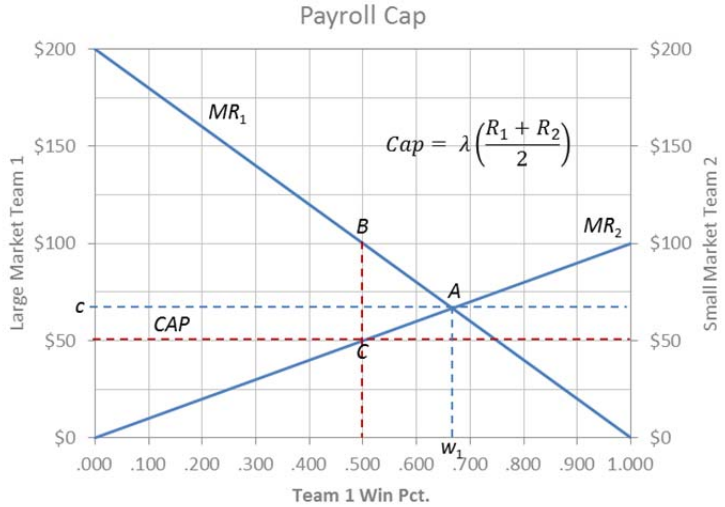







Basic QFV Theory
$200
$150
$100
$50
$0
MR_1
MR_2
B
A
c
C
w_1
.000 .100 .200 .300 .400 .500 .600 .700 .800 .900 1.000
Team 1 Win Pct.
Large Market Team 1
Small Market Team 2


Revenue Sharing Paradox
$200
$150
$100
$50
$0
MR_1
$R_1' = \alpha R_1 + (1-\alpha)\frac{R_1 + R_2}{2}$
MR_2
αMR_1
A
c
αMR_2
c'
B
w_1
.000 .100 .200 .300 .400 .500 .600 .700 .800 .900 1.000
Team 1 Win Pct.
Large Market Team 1
Small Market Team 2


Payroll Cap
$200
$150
$100
$50
$0
MR_1
$Cap = \lambda\left(\frac{R_1 + R_2}{2}\right)$
B
MR_2
A
c
CAP
C
w_1
.000 .100 .200 .300 .400 .500 .600 .700 .800 .900 1.000
Team 1 Win Pct.
Large Market Team 1
Small Market Team 2