Just How Tough Was It?
(How Competitive is Major League Baseball?)

By Gary Fletcher

When I was a lad my uncle and I were watching a hockey game and he said to me, "You know, they're not very good, but they sure are competitive!" He was speaking about the New York Rangers in the early 1960's, but this isn't about the Rangers or, for that matter, about hockey. It's not even about good or bad, not really. It's about competitiveness.

It's possible to be competitive without being as good as your opponent, right? It's even possible to be competitive with an opponent that is clearly better than you are. But there does come a point where your ability to compete approaches zero.

If a team gets beat 10-0 that is not a competitive game. Sure, that team might come back and win the next game. They might even play a seven game World Series, get outscored 55-27, and still win four games out of the seven. Pretty weird, I admit, but it *could* happen…?

I guess we could say that it was a competitive World Series. To be more accurate, though, the 1960 World Series was composed of 4 competitive games, yes, but also 3 games that were anything but.

Thanks to Retrosheet I was able to build a database with the scores of every major league baseball game played from 1871 through 2014 (Retrosheet does have all the *scores*). That's 208,447 games if you're counting. I'm a lousy mathematician, but a reasonable arithmetician. Here is a simple, straightforward way to calculate the competitive environment of groups of teams (you know, leagues):

- Calculate the margin of victory in every game (Winning Score minus Losing Score)
- Now you know how many games were decided by 1 run, 2 runs, 3 runs, and so on
- Convert to percentages. For example, in 1956 there were 1239 games. There were 7 games that ended in ties. The percentage of games that ended in a tie is therefore 0.56%. A tie in my mind is a perfectly competitive game, so we can multiply 0.56% by 1, which of course is 0.56
- Now we need to weight each run differential. I figure that a one run differential is only 90% as competitive as a tie game. So I divide 1 by .9 and get a weighting number of 1.111111. For a two run differential we divide 1.111111 by .9 and that equals 1.234568…and so on, right up to the largest run differential in the data base which is 37 runs. The run differential weighting factor for that is 49.32046.
- Anyway, we take the percentage of games in any given season which were decided by 0, 1, 2, …37 runs (37 runs is the largest margin of victory in MLB history) and multiply them by these weighting factors, add them all up and we get what I call a competition score…a C-Score. Actually I then multiply the result by

100 and eliminate the decimal points. This way instead of a range of 1.000000 to 4.000000 we get a range of 100 to 400. That's why the total C-Score below is 149 instead of 1.486. It just communicates better, to my mind, okay? *

Here's the chart for 1956:

C-Score Breakdown for 1956 Season				
Run Margins	# Games	% of Games	Comp Factor	C-Score
0	7	0.56%	1.000	0.006
1	363	29.30%	1.111	0.326
2	225	18.16%	1.235	0.224
3	203	16.38%	1.372	0.225
4	142	11.46%	1.524	0.175
5	95	7.67%	1.694	0.130
6	66	5.33%	1.882	0.100
7	43	3.47%	2.091	0.073
8	30	2.42%	2.323	0.056
9	17	1.37%	2.581	0.035
10	16	1.29%	2.868	0.037
11	11	0.89%	3.187	0.028
12	9	0.73%	3.541	0.026
13	1	0.08%	3.934	0.003
14	5	0.40%	4.371	0.018
15	4	0.32%	4.857	0.016
16	1	0.08%	5.397	0.004
17	0	0.00%	5.996	0.000
18	1	0.08%	6.662	0.005
			Total C-Score 1956	**149**

A perfectly competitive performance (where every game ended in a tie) would result in a C-Score of 100. If every game were decided by 37 runs the C-Score would be 4932.

This makes 1956 the 61st most competitive year ever. The most competitive year of all time was 1916 (C-Score of 138). The least competitive year of all time was 1872, with a C-Score of 304.

Now, let's look at the C-Scores year by year:

Year	C-Scores		Rank
1871	235		141
1872	304	Least competitive year ever	144
1873	276		143
1874	238		142
1875	219		140
1876	202		139
1877	175		131
1878	161		118
1879	176		133
1880	164		121
1881	158		115
1882	176		132
1883	182		137
1884	177		134
1885	165		123
1886	173		129
1887	181		136
1888	161		117
1889	171		127
1890	175		130
1891	168		124
1892	162		119
1893	170		126
1894	190		138
1895	178		135
1896	172		128
1897	170		125
1898	162		120
1899	164		122
1900	158	Average C-Score 1871–1900 = 184	114
1901	157	American League Startup	112
1902	155		109
1903	153	First World Series	97
1904	148		57
1905	148		58
1906	146		32
1907	143		12

Year	C-Scores		Rank
1908	144		14
1909	144		15
1910	146		38
1911	150		72
1912	152		82
1913	145		27
1914	141		4
1915	144		17
1916	138		1
1917	141		3
1918	141	Average C-Score 1901-1918 = 146	5
1919	143	Start of Babe Ruth Revolution	9
1920	150		73
1921	154		103
1922	153		94
1923	153		96
1924	151		77
1925	153		100
1926	149		67
1927	148		59
1928	151		79
1929	155		107
1930	157		113
1931	154		105
1932	149		66
1933	150		71
1934	153		93
1935	156		111
1936	160		116
1937	153		98
1938	154		102
1939	155		110
1940	153	Average C-Score 1919-1940 = 153	92
1941	149	Start of the War Years	64
1942	146		37
1943	145		23
1944	149		62
1945	147		53
1946	147	Average C-Score during WW II = 147	47

Year	C-Scores		Rank
1947	149	Jackie Robinson!	65
1948	152		84
1949	153		91
1950	153		99
1951	149		63
1952	147		51
1953	154		104
1954	150	Gary Fletcher Born	69
1955	152	Last C-Score 150 or more till 1987	86
1956	149		61
1957	147		42
1958	146		33
1959	147		50
1960	144	Mazeroski's Homer	20
1961	147	Expansion…see any effect?	41
1962	147		43
1963	145		28
1964	144		16
1965	143		8
1966	143		10
1967	143		7
1968	140		2
1969	145	Expansion…see any effect?	26
1970	145		24
1971	143		6
1972	143		11
1973	147		44
1974	147		48
1975	146		36
1976	144		13
1977	146	Expansion…see any effect?	31
1978	144		19
1979	147		45
1980	144		21
1981	146		30
1982	145		22
1983	145		25
1984	144		18
1985	147		52

Year	C-Scores		Rank
1986	147	Average C-Score 1956-1986 = 145	40
1987	150		75
1988	146		34
1989	147		46
1990	148		56
1991	146		35
1992	145		29
1993	149		60
1994	152	Start of 17 seasons with C-Score 150 or more	85
1995	151		80
1996	153		95
1997	150		74
1998	151		76
1999	155		106
2000	155		108
2001	152		87
2002	152		83
2003	152		89
2004	152		88
2005	150		68
2006	152		90
2007	153		101
2008	151		78
2009	151		81
2010	150	Average C-Score 1994-2010 = 152	70
2011	147		55
2012	147		49
2013	147		54
2014	146		39

At this point I was gratified to see what I kind of expected to see – that 19th century MLB games aren't very competitive. The first time we have a score under 150 is 1904. That's interesting for those of us who feel that real major league baseball started in the early 1900s, the time when true, long term stability was established.

Note that the highest C-Score for MLB since 1903 is 160 which happened in 1936. The average score since 1903 is 148. The average score from 1871 through 1902, by comparison, is 183. FYI, roughly 17 C-Score points means about 1 run per game.

The Bigger The Stars, The Lower The Competition?

What causes higher or lower C-Scores? The answer is stupefyingly simple from a technical standpoint. The higher the runs scored per game, the less competitive the games are. **(See table at the end of this article)

And what causes that? Obviously, the unequal distribution of talent among the teams. Slightly less obviously, hitting unfriendly environments. As already noted the average C-Score from 1871 through 1902 was 183. Those seasons saw the number of teams and number of leagues seemingly changing by the minute and the players moved from team to team and league to league at the merest whim.

But at the turn of the century this was no longer true. We had two leagues, each with 8 teams, each working together with uniform rules, the same number of games per season, an agreement in place to have the winner of each league meet in a short series to determine a World Champion. It didn't exactly happen all at once, but it happened soon enough.

I assert that the result of all this was stability in many things, but including an inevitable leveling of the talent distribution among the teams. Not perfectly level. No, of course not. But a constant tendency towards equal talent that continues so long as there are no significant changes in the environment of the game.

Another way of stating this is that significant changes to the game will alter how it is played, who it is played by, how successful certain kinds of players are. In the early days of a significant change what we perceive as talent will be spread unequally among the teams; as time goes on competitive balance will reassert itself.

It will reassert itself, inevitably, as it always does, with defensive strategies to mitigate the offensive gains of the early years. Sometimes the adjustments happen quickly. Sometimes they take many years.

My tools here are coarse, unrefined. But what do they indicate? I see the games achieving a relatively stable C-Score right up until around 1919-1920, the year when the power hitting revolution altered the game. The C-Score average 1903 through 1918 was 145. The C-Level average from 1919 through 1940 was 153.

Then Pearl Harbour, World War II. The level of talent may have been lower as many fine players found themselves playing against Germany and Japan, but I am thinking that the result is less stars and more planets…or less boulders and more sand, if you prefer. The C-Scores in the years 1941 to 1945 were 149, 146, 145, 149 and 147, an average of 147. I would say the game was more competitive, though perhaps not dramatically so.

Starting in 1947 we saw the breaking of the colour line, what we can call the Jackie Robinson revolution. We saw a remarkable number of truly great players come in to the game – the great black ballplayers. And the C-Scores for the years 1947 through 1955 were 149, 152, 153, 153, 149, 147, 154, 150, 152…an average of 151.

From 1956 through 1986 we saw an almost uninterrupted stretch of competitive seasons, averaging a C-Score of 145 per year. In 1987 we hit 150 for the first time in 30 years; everyone was talking about the sudden upsurge of hitting in 1987.

It still seems like an anomaly as the following seasons scored at 146, 147, 148, 146, 145 and 149. But then things appeared to change. From 1994 through 2010 every season scored at least 150, with an average of 152. The highest score in this stretch was 155 in both 1999 and 2000.

Kind of matches up with the steroid era, doesn't it? We certainly saw some all-time dominant individual seasons during that period. Wouldn't that affect the talent distribution among the teams?

Just sayin'.

Anyway, the last few years have seen a trend towards more and more competitive games, down to a C-Score of 146 in 2014. Seems to me that the effects of the steroid era, if that is what we saw during the years 1994 through 2010, would have slowly washed out starting around the early to mid-2000s.

Did you get this far? Then thanks for reading. Comments and criticisms welcomed. Ridicule accepted if you feel the need.

GFletch November 10th 2015.

*At this point some of you troublemakers will no doubt be asking, "What's the deal with using .9 to create weighting factors and all that jazz?" Well, I just made it up. You could use .837 instead of .9, or you could use whatever numbers or set of numbers you like so long as they ascend or descend in some consistent way. Your range might be narrower or broader. You could choose to use descending numbers from 1.0 instead of ascending numbers as I did. That would result in higher C-Scores indicating a more competitive environment…it's just a matter of taste, really. My choice was to have higher numbers indicate less and less competitive games. Anyway, the general conclusions would be the same….unless you just did something completely ridiculous.

** See table following showing Runs Per Game paired with Seasonal C-Scores

Year	Runs Per Game	C-Score
1871	20.94	235
1872	18.52	304
1873	17.95	276
1874	14.96	238
1894	14.75	190
1895	13.15	178
1893	13.14	170
1887	12.67	181
1875	12.27	219
1896	12.08	172
1890	12.01	175
1889	11.91	171
1876	11.79	202
1897	11.75	170
1883	11.50	182
1891	11.39	168
1877	11.33	175
1930	11.10	157
1886	10.94	173
1884	10.83	177
1882	10.65	176
1879	10.60	176
1899	10.48	164
1885	10.44	165
1900	10.42	158
1936	10.38	160
1929	10.37	155
1878	10.35	161
2000	10.28	155
1925	10.26	153
1881	10.20	158
1892	10.19	162
1999	10.17	155
1996	10.07	153
1901	9.97	157
1898	9.91	162
1994	9.85	152

Year	Runs Per Game	C-Score
1932	9.83	149
1934	9.81	153
1935	9.79	156
1938	9.79	154
1937	9.74	153
1922	9.74	153
1888	9.73	161
2006	9.72	152
1921	9.71	154
1950	9.70	153
1995	9.69	151
1939	9.65	155
1923	9.63	153
2004	9.63	152
1931	9.62	154
2007	9.59	153
1998	9.58	151
2001	9.55	152
1997	9.53	150
1924	9.52	151
1927	9.50	148
1928	9.46	151
2003	9.46	152
1987	9.45	150
1880	9.39	164
1940	9.36	153
2008	9.30	151
1926	9.27	149
2002	9.24	152
2009	9.23	151
1949	9.21	153
1953	9.21	154
1993	9.20	149
2005	9.18	150
1948	9.16	152
1951	9.09	149
1912	9.05	152

Year	Runs Per Game	C-Score
1961	9.05	147
1911	9.03	150
1941	8.98	149
1955	8.97	152
1933	8.96	150
1977	8.94	146
1962	8.92	147
1979	8.92	147
1956	8.90	149
1903	8.88	153
1902	8.86	155
1986	8.82	147
2010	8.77	150
1959	8.77	147
1954	8.75	150
1920	8.72	150
1947	8.71	149
1970	8.68	145
1985	8.66	147
2012	8.65	147
1960	8.63	144
1991	8.62	146
1983	8.62	145
1957	8.61	147
1982	8.60	145
1980	8.58	144
2011	8.57	147
1958	8.57	146
1984	8.51	144
1990	8.51	148
1973	8.43	147
1975	8.43	146
1945	8.36	147
1952	8.35	147
1944	8.34	149
2013	8.33	147
1988	8.28	146

Year	Runs Per Game	C-Score
1989	8.26	147
1974	8.25	147
1992	8.23	145
1978	8.21	144
1942	8.17	146
1969	8.14	145
2014	8.13	146
1913	8.08	145
1964	8.07	144
1946	8.01	147
1981	8.00	146
1976	7.99	144
1966	7.99	143
1965	7.98	143
1963	7.89	145
1943	7.83	145
1905	7.79	148
1971	7.78	143
1919	7.74	143
1914	7.73	141
1910	7.67	146
1915	7.63	144
1967	7.54	143
1904	7.45	148
1972	7.37	143
1918	7.27	141
1906	7.23	146
1917	7.18	141
1916	7.13	138
1909	7.10	144
1907	7.06	143
1968	6.84	140
1908	6.77	144

You still here? Then contact your friends and let them know that low scores are strongly correlated with competitiveness.