THE HAZARDS OF MORAL HAZARD: COMMENT ON GOFF, SHUGHART, AND TOLLISON

STEVEN D. LEVITT*

Goff et al. [1997] argue that the sharp increase in the number of hit batsmen after the adoption of the designated hitter rule is due to moral hazard. I argue instead that simple changes in the composition of batters faced explains much of the observed effect. Pitchers are bad hitters and therefore are much less likely to be hit than their designated hitters. Furthermore, there is no correlation between the frequency with which individual pitchers hit opposing batsmen and their personal likelihood of being hit by a pitch while batting, contrary to the predictions of the moral hazard model. (JEL D81, J28)

I. INTRODUCTION

In a recent study, Goff, Shughart, and Tollison [1997] demonstrate that the adoption of the designated hitter rule in the American League is associated with a sharp increase in the number of hit batsmen. These authors suggest an intriguing economic explanation for this empirical regularity: since pitchers in the American League no longer have to bat and risk being hit by pitches themselves, they do not face the full cost of their actions when hitting opposing batters, leading to a classic moral hazard problem.

It is important to note, however, that the reduced-form empirical strategy used by those authors has no power to distinguish between such a moral hazard story and other competing explanations. Foremost among the other explanations is a simple compositional change in the type of batter faced. Pitchers are by-and-large very poor hitters, making the marginal cost of a hit batsmen when a pitcher is at the plate high relative to that of other batters. Consequently, pitchers are only roughly one-third as likely to be hit by a pitch as are other batters. With the adoption of the designated hitter rule, pitchers are replaced at the plate by designated hitters who are far more effective batters and therefore more likely to be hit batsmen. Thus even if there is no change in the rate at which any batter of a given skill level is a hit batsmen (i.e. no change in behavior on the part of pitchers), the number of hit batsmen will rise when the designated hitter rule is put into effect.

Using data from 1993–1996, I demonstrate in this paper that compositional effects alone explain over 80% of the observed cross-league difference in hit batsmen in my sample. Excluding pitchers, National League batters are hit by a pitch once every 115.4 at bats and American League batters are hit every 114.5 at bats, suggesting little if any moral hazard once compositional differences are eliminated. In fairness to Goff et al., however, it should be stressed that the observed gap in hit batsmen between the leagues is smaller in my sample than in theirs, so that it is unlikely that compositional effects alone can explain their entire finding.[1]

A number of other factors, however, further call into question the plausibility of the moral hazard argument. First, the very low rate of pitchers being hit by pitched balls when at the plate implies that only rarely are pitchers actually punished for hitting an opposing batter. Even if it were the case that *every* instance of a pitcher being hit by a pitch was retribution,

1. Data on pitchers' batting performance is surprisingly difficult to obtain. Among the rich array of resources for baseball statistics, the only source that lists the number of times pitchers are hit while batting is Carter and Sloan [multiple editions]. The data is for individual pitchers, however, making calculation of the aggregated statistics time consuming. Consequently, I have not attempted to expand the analysis beyond the four years analyzed here.

©Western Economic Association International

TABLE I
Comparison of Batting Statistics Across Leagues, 1993–1996

League	(1) At-bats	(2) Hit batsmen	(3) Walks	(4) Total bases	(5) At-bats/ hit batsmen	(6) At-bats/ walk	(7) Slugging percentage
American League total	281,316	2,456	231,349	124,513	114.5	9.0	.443
National League total	279,317	2,325	25,819	113,584	120.1	10.6	.407
Pitchers	16,777	50	647	3,207	335.5	25.9	.191
Non-pitchers	262,540	2,275	25,819	110,377	115.4	10.2	.420

Notes: Data are combined totals for the 1993–1996 seasons. Values in the table are author's calculations using data in Carter and Sloan [multiple editions]. All data are for batting performance, i.e. the row corresponding to pitchers in the National league is the batting performance of pitchers when they are themselves at the plate.

only one in 50 times would a pitcher be punished for hitting an opposing batsmen. Second, there does not appear to be any correlation between the frequency with which pitchers hit opposing batsmen and the likelihood that the pitcher will himself be hit while at the plate. If retaliation is the motivation for hitting pitchers when at bat, as predicted by the moral hazard model, then there should be a positive correlation between those two variables.

II. FURTHER EXPLORATION OF THE MORAL HAZARD ARGUMENT

Table I presents relevant data by league for the years 1993–1996. In addition, National League batting statistics are broken down into pitchers and non-pitchers. The first four columns provide aggregate totals, the last three columns normalize by at-bats for easier comparisons. A number of important points emerge from Table I. First, comparing American League and National League totals, the elevated rate of hit batsmen in the American League demonstrated by Goff, Shughart, and Tollison [1997] for the period up until 1990 is also present in the more recent data used here. American League batters are hit an additional 131 times over the four year period;[2] normalized by at-bats, American League batters are 5% more likely to be hit by pitches. The difference between the leagues is somewhat smaller than that observed by Goff et al. in the earlier period (roughly 50 additional hit batsmen per year).

2. An abbreviated schedule of games was played in both the 1994 and the 1995 seasons due to a players' strike.

Second, the frequency with which pitchers are hit by pitches while batting is very low. Normalized by at-bats in column 5, pitchers are approximately one-third as likely to be hit by a pitch as other batters. This is consistent with pitchers being very poor batters. Pitchers' slugging percentages are less than half as great as other batters, making the opportunity cost of hitting a pitcher higher than that of a better hitter. Consistent with this explanation, pitchers are also much less likely to be walked than are non-pitchers (column 6). When pitchers are eliminated from the National League calculations—so that the composition of National League batters more closely matches that of the American League—the rate at which batsmen are hit is almost identical to the American League (115.4 vs. 114.5). Less than 20% of the observed variation in hit batsmen across leagues remains once pitchers are removed, leaving little to be explained by moral hazard, at least in the sample examined.[3] Interestingly, the walk differential across leagues, which is affected by composition effects, but is not subject to moral hazard, persists even when pitchers are eliminated from the National League sample.

A third observation emerging from Table I is the rarity with which pitchers are struck by

3. Pitchers represent about 6% of the at-bats in the National League and are one-third as likely to be hit. Consequently, the presence of pitchers at the plate can explain roughly a 4% differential in aggregate hit batsmen across leagues. This differential largely eliminates the gap between leagues in more recent years, but could not fully explain the magnitude of the effect observed in earlier years in Goff, Shughart, and Tollison [1997].

TABLE II
Frequency of Hit Batsmen and a Pitcher's Own Likelihood of being Hit by a Pitch while Batting

Quartile	(1) Innings pitched	(2) Opposing batsmen hit by these pitchers	(3) Number of times these pitchers are themselves hit by a pitch while batting	(4) Rate of hitting opposing batsmen (per inning pitched)	(5) Rate of pitcher being hit while batting (per inning pitched)
I	8,918	77	7	.00863	.00078
II	7,541	158	6	.02095	.00080
III	7,270	247	7	.03398	.00096
IV	7,047	396	4	.05619	.00057

Notes: Data are for National League pitchers who pitch at least as many innings as games played by their team in the year in question. Over the period 1993-1996, there are 160 qualifying pitcher-year observations. Quartiles correspond to the frequency with which the pitcher hits opposing batsmen, e.g. the first quartile composed of the 40 pitcher-year observations with the lowest rate of hit batsmen.

pitched balls: over the four years of data presented, on only 50 occasions was a pitcher hit, or less than 13 times per year. For the moral hazard story to be empirically relevant, one would expect that pitchers who hit opposing batters must actually be punished. Clearly, however, such punishment is rare. Pitchers represent only 2% of the total hit batsmen. Thus, even if every pitcher hit by a pitch was hit in retaliation, punishment would be administered only one in every 50 times a pitcher hits an opposing player.

Similarly, one can categorize pitchers according to how frequently they hit opposing batsmen to determine whether this raises their own likelihood of being hit. Limiting the sample to pitchers with at least as many innings as games played by their team (the criteria for consideration for the earned run average title), the 160 qualifying pitchers are divided into four equal-sized quartiles according to the rate at which they hit opposing batsmen. The results, aggregated across the four years, are presented in Table II. Pitchers who hit opposing batsmen at the lowest rates (quartile I), hit .00863 batsmen per inning, and are themselves hit while batting once every .00078 in-

nings. The fourth quartile pitchers hit opposing batsmen more than six times as frequently as do the first quartile pitchers, yet they are themselves hit less frequently when batting. The two intermediate quartiles are hit somewhat more often than either quartiles I or IV. Thus, there once again is little evidence to support a retaliation motive to pitchers being struck by pitches, undermining the moral hazard argument.[4]

III. CONCLUSION

In summary, this paper casts doubt on moral hazard as the sole explanation for the rise in hit batsmen following the introduction of the designated hitter rule. Simple compositional changes appear to explain a large proportion of the observed rise. Punishment for hitting opposing batsmen is only rarely delivered, and there is no systematic evidence that pitchers who more frequently hit opposing batsmen are disproportionately hit themselves. While there may be a moral hazard component of hit batsmen, its empirical magnitude is likely to be much smaller than claimed by Goff, Shugart, and Tollison [1997].

4. An alternative approach to this issue is to compare the set of pitchers hit while at the plate to those never hit over the course of a season. Once again, there is no evidence of retaliation. The set of pitchers who are themselves hit by a pitch hit .0318 opposing batsmen per inning; those pitchers never hit by a pitch during the seasons hit .0319 opposing batsmen per inning.

REFERENCES

Carter, Craig and Dave Sloan. *The Sporting News Baseball Guide.* St. Louis: The Sporting News Publishing, multiple editions.

Goff, Brian, William Shughart and Robert Tollison. "Batter Up! Moral Hazard and the Effects of the Designated Hitter Rule on Hit Batsmen." *Economic Inquiry*, July 1997, 555–61.