

# Moneyball (2011) economic analysis



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## The Moneyball Theory: An Analysis through the Lens of the Efficient Market Hypothesis

- A review of *Moneyball* (2011)
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## **Introduction:**

*Moneyball* (2011) is a movie that deals with the 2002 season of the Oakland Athletics in the American Baseball League and the legendary run precipitated by the nifty purchases effectuated by their General Manager, Billy Beane. This review attempts to look into the economics behind the purchasing strategy of Beane and tries to evaluate the baseball labour market, as objectively as possible. The baseball labour market is conceptualized from the lens of the efficient market hypothesis, which postulates that the price of an asset in a market is fully indicative of all the information available on the market as to the value of that asset. A contention that Beane's team merely "got lucky" by winning the 2002 season is emphatically rebutted by analyzing trends in the baseball market from the perspective of informational efficiency, equilibrium prices, demand and supply. The paper then concludes that the market, by virtue of informational efficiency is exploited by Beane, and subsequently corrects itself for the same, which then acts as a causal factor in Beane's streak of losses.

## **Plot Synopsis:**

*Moneyball* (2011) is a film that chronicles the 2002 season of the Oakland Athletics in the American Baseball League[1], and the General Manager Billy Beane's attempts to construct a championship winning team on an extremely tight budget. After being forced to operate at a budget of \$40 million (almost three to four times smaller than certain other teams), Beane hires a Yale Economics graduate, Peter Brand, who claims that baseball as a

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game is widely misread and reconfigures Beane's perspective on the value of potential purchases. This approach, which has come to be known as the Moneyball Theory/Moneyball Hypothesis has revolutionized the market for baseball players around the world and has set other sports as well, on the course to figuring out the true value of certain qualities they look for in potential purchases.

Brand hypothesizes that certain assets sought after in baseball players are fundamentally undervalued and that it is this undervaluation, coupled with the privilege given to certain other qualities that seems to dictate prices for baseball players in the market. He then statistically proves the above and encourages Beane to make his purchases based on the aforementioned model. While the model is unsuccessful at first, when partially implemented, it becomes hugely successful when implemented rigorously. In the course of this paper, the over/undervalued assets will be looked into and commented upon from the standpoint of the Moneyball Hypothesis as a deviation from the Efficient Market Hypothesis (a concept from the world of finance dealing with assumptions made about the valuation of assets), as well as the reversion of the market to equilibrium post-the 2002 season and how the baseball labour market acclimatized itself to the changes taking place as well as the change in preferences that resulted from the same. This paper also looks at looking at how the market was made efficient post-the 2002 season, whereby the issue of informational efficiency in the market was fixed and the same led to the prices of players with the desired skills increasing and settling to a new equilibrium, and the prices of players with skills previously

thought to be desirable decreasing and settling at a new equilibrium, by virtue of the market forces of demand and supply.

## **Analysis:**

### **The Efficient Market Hypothesis:**

This is a theory that assumes that the price of an asset is indicative of all publicly available information about the value (and in this case, productivity) of an asset.[2]Therefore, in this case, the assumption is made that the price a player commands on the baseball labour market is commensurate to the value he is thought to provide to the team that purchases him. The information in question here is as to whether the criteria made use of by franchises to judge the value of players is actually commensurate to how these criteria directly contribute to the number of victories. These criteria (namely *slugging percentage* and *on-base percentage* ) although embroiled in baseball knowledge, will be briefly demystified in the following section before reverting to the question of how the overvaluing of the former and consequent undervaluing of the latter made the baseball labour market inefficient in terms of information.

### **On-Base and Slugging Percentages:**

As per the official rules of Major League Baseball, runs can be scored, either by *hits* or by *walks*. [3]The former would constitute actually swinging at the ball, making contact and then running between bases. The latter however, are earned when a player doesn't swing at a ball coming to him, and the same falls outside the strike zone (the area within which balls are to be pitched) *four times* .[4]Considering these forms of run scoring, statistics to measure batting productivity, namely the *slugging percentage* and the *on-*  
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*base percentage* are considered. The former takes into account the total bases ran divided by the total pitches batted and the latter takes walks into account by computing the fraction of plate appearances in which the player reached base either through a hit, or through a walk, thereby acknowledging the disciplined hitting required to procure walks.[5]The market functioning as such, the value of a player as an asset to a “victorious” team is determined by the “slugging percentage” and not the “on base percentage”, which leads to the market’s inefficiency, which shall be further delved into.

## **The Moneyball Hypothesis and the Efficient Market Hypothesis:**

In an empirical study conducted by Prof. John Hakes and Prof. Raymond Sauer[6]of Clemson University, it was shown numerically that the on-base percentage is more of a determining factor in the number of victories a team enjoys vis-à-vis the slugging percentage, which is considered to be of a greater value to the market.[7]As per the survey, 83% of the differences between the winning percentages could be explained by the on-base percentages, while only 77% could be explained by virtue of the slugging percentages. This material fact dealing with the market was not taken into account by the franchises, which are the potential consumers in this case. The market, therefore can be said to be inefficient in this particular case, or can be said to suffer from “informational inefficiency”. The beginning of the movie best epitomizes the sentiment of informational inefficiency in the baseball labour market, by means of the words:

*“There will always be people who are ahead of the curve, and people who are behind the curve. But it is knowledge that moves the curve.” [8]*

## **Informational Efficiency:**

Informational efficiency is a metric indicative of whether the price of an asset is reflective of all the information available on the market about it, or not.

The efficient market hypothesis makes the assumption that every market has informational efficiency.[9] This is clearly not the case with the Oakland Athletics team, as has been conclusively shown as aforementioned. It is this informational inefficiency present in the market that had been taken advantage of by Beane and put to such good use. As per the theory of Informational Market Efficiency, the numerical value of people who perceive an asset to be undervalued is equal to the numerical value of people who perceive an asset to be overvalued.[10] As per our situation, this is clearly not the case. The asset here being the “on base percentage” of a player, is hugely undervalued by every other player on the market apart from Billy Beane, which allows him to make his purchases as he does.[11] In conclusion, the Moneyball Hypothesis is an example of a deviation from the Efficient Market Hypothesis, whereby the labour market in this case can be said to suffer from informational inefficiency, whereby the “knowledge” that on-base percentage is more of a contributing factor towards victory than slugging percentage (as established above) was absent in the market up until the decisive season, and this basically made the market inefficient and amenable to exploitation by Beane.

## **Increase in the Informational Efficiency of the Market after the 2002 Season:**

As per the plot of the movie[12], the supposed “luck” of Billy Beane began to run out and he struggles to advance to the playoffs of the game in the

following seasons, which led a lot of his critics to dismiss his dream run as the Oakland Athletics Manager as a mere stroke of luck. However, this phenomenon can be explained by the efficient market hypothesis as well. In the case of the modification of market prices, the survey conducted by Prof. John Hakes and Raymond Sauer[13] is taken as a sample to show how the equilibrium prices of players with greater on-base percentage increases and conversely, how the equilibrium prices of players previously thought to be extremely valuable, i. e. those with high slugging percentages decreased commensurately to settle at a new equilibrium, thus making the market gain a modicum of informational efficiency. As per the efficient market hypothesis, the equilibrium prices (once the same have been determined) of the market are indicative of the value, which from the data provided appears to make the market more efficient in nature.[14] It is the submission of the researcher that the same cannot be characterized as a “stroke of luck” and that the efficient market hypothesis clearly shows how the market “corrects” itself for the informational inefficiency.

The efficient market therefore, is something that is said to be affected by *information* and that such information is highly unpredictable in nature, a proposition which explains this situation perfectly.[15] Therefore, it is submitted by the researcher that the failure of the Oakland Athletics in the coming seasons was not a result of the fact that the first season was a fluke, but merely due to the fact that the market has indeed gained informational efficiency in the wake of the 2002 season and has awoken to the reality that it was viewing baseball players differently before. A sample salary statistic from the aforementioned survey is provided here to showcase the level at



which the information penetrated the market, and how the market had commensurately changed in the following season.

At the turn of the 2001 season, the logarithm of the average salary paid to an individual with a high slugging percentage, (the number of home runs is taken to determine the same) was valued at 3.102, which then over the successive seasons (2002, 2003 and 2004) decreases in value to 2.080, 2.075 and 2.047. Therefore, a clear decrease can be seen in the salaries of players with exclusively high slugging percentages. Conversely, at the turn of the 2001 season, the logarithmic coefficients of the players with high on-base percentage (but not commensurately high slugging percentages) increases from -0.132 in 2001, to 0.965, 1.351 and 3.681 in 2002, 2003 and 2004 respectively. It can be seen from this metric that the statistic of on-base percentage as an asset in a baseball player was valued more in 2004 than the on-base percentage was in 2001.[16]

### **Readjustment of Equilibrium Prices based on New Information in the Market:**

As per the theory of demand and supply, when the quantity demanded of a particular good increases and the quantity supplied remains the same, the price of the good at market equilibrium will increase commensurately.[17]It can be said in this particular case that there is a patent increase in the demand for players with higher on-base percentages in the years following 2001, considering that the salary is indicative of the price trends. There is also a commensurate decrease in the demand for players with high slugging percentages post 2004, considering the decrease in salary seen to such players. Considering that the supply of players in the market remains the

same over the same period, the market arrives at a new equilibrium price in terms of the increase in demand.

As per Samuelson and Nordhaus, an efficient market will incorporate all new information is understood completely by market participants and that the same will be reflected in the equilibrium price of the assets in question.

[18]Therefore, it is the conclusion of the researcher that what followed the 2001 season of the Oakland Athletics was not a case of mere chance, but merely the market absorbing information and gaining informational efficiency, which then changed the equilibrium salaries of the players in question.

### **Conclusion:**

In conclusion the labour market in the case of baseball can be said to possess a single informational inefficiency as regards on-base and slugging percentages, which was duly exploited by Billy Beane. However, following the decisive season of 2001, the market corrected itself for the informational inefficiency, which was duly demonstrated by the changes in equilibrium salaries of the players involved (those possessing distinctly, both the skills in question). It is therefore, the submission of the researcher in this case that the whole process of market reconfiguration can be explained through the efficient market hypothesis and that the victories of Beane cannot be merely dismissed as “chance” and that the same can be explained through the lens of the efficient market hypothesis.

In this review, the concepts of the efficient market hypothesis, informational efficiency, equilibrium prices as well as the concepts of demand and supply

influencing the same have been covered. In conclusion, *Moneyball* (2011) provides a masterful account of the functioning of the baseball labour market and the economics that underlie the same.

## **Bibliography:**

### **Books:**

1. N. Gregory Mankiw, *Principles of Economics*, 6<sup>th</sup> ed. 2012
2. Paul A. Samuelson and William D. Nordhaus, “ *Economics* ”, 18<sup>th</sup> ed. 2007.

### **Articles:**

1. Herman Demmink, “ Value of Stealing Bases in Major League Baseball: Stealing Runs and Wins”, *Public Choice*, Vol. 142, No. 3, Essays in Honour of Robert D. Tollison, March 2010, pp. 497-505.
2. John D. Hakes and Raymond D. Sauer, “ An Economic Evaluation of the Moneyball Hypothesis” *The Journal of Economic Perspectives*, Vol. 20, No. 3, Summer 2006, pp. 173-186.
3. Jean-Jacques Laffront and Eric S. Mason, “ *The Efficient Market Hypothesis and Insider Trading on the Stock Market*” , *Journal of Political Economy*, Vol. 98, No. 1, February 1990

### **Other Sources:**

1. Feature Film, *Moneyball* (2011)
2. The Official Rules of Major League Baseball, accessible at [http://mlb.com/mlb/downloads/y2013/official\\_baseball\\_rules.pdf](http://mlb.com/mlb/downloads/y2013/official_baseball_rules.pdf)

[1]Moneyball (2011), The Internet Movie Database, accessible at: [http://www.imdb.com/title/tt1210166/?ref\\_=nv\\_sr\\_1](http://www.imdb.com/title/tt1210166/?ref_=nv_sr_1)( Last accessed on 15<sup>th</sup> August 2014)

[2]N. Gregory Mankiw, Principles of Economics, 6<sup>th</sup> ed. 2012, pp. 585-566

[3]Official Rules, Major League Baseball, available at:

[http://mlb.mlb.com/mlb/downloads/y2013/official\\_baseball\\_rules.pdf](http://mlb.mlb.com/mlb/downloads/y2013/official_baseball_rules.pdf), (last accessed 16<sup>th</sup> August 2014)

[4]Herman Demmink, “ Value of Stealing Bases in Major League Baseball: Stealing Runs and Wins”, Public Choice, Vol. 142, No. 3, Essays in Honour of Robert D. Tollison, March 2010, pp. 497-505.

[5]John D. Hakes and Raymond D. Sauer, “ An Economic Evaluation of the Moneyball Hypothesis” The Journal of Economic Perspectives, Vol. 20, No. 3, Summer 2006, pp. 173-186.

[6] *Ibid*

[7] *Ibid*

[8]Moneyball (2011), The Internet Movie Script Database, available at:

<http://www.imsdb.com/scripts/Moneyball.html>(last accessed on 17<sup>th</sup> August 2014)

[9]N. Gregory Mankiw, Principles of Economics, 6<sup>th</sup> ed. 2012, pp. 620-621

[10]

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[12] *Supra* n. 1

[13] *Supra* n. 6

[14] Jean-Jacques Laffont and Eric S. Mason, “ *The Efficient Market Hypothesis and Insider Trading on the Stock Market*”, *Journal of Political Economy*, Vol. 98, No. 1, February 1990

[15] Paul A. Samuelson and William D. Nordhaus, “ *Economics* ”, 18<sup>th</sup> ed. 2007.

[16] *Supra* n. 6

[17] Gregory N. Mankiw, “ *Principles of Economics* ”, 6<sup>th</sup> ed. 2012, pp. 71-72

[18] *Supra* n. 15, pp. 525-526