

Do Players Perform for Pay?  
An Empirical Examination via NFL Players' Compensation Contracts \* †

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*Keywords:* pay-performance sensitivity; incentive-based compensation; NFL / sports compensation; win probability added (WPA); expected points added (EPA); sports analytics.

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# Do Players Perform for Pay?

## An Empirical Examination via NFL Players' Compensation Contracts

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**Abstract.** How to properly compensate and incentivize players is an important question in the realm of professional sports, and more broadly, is a central question in contract design. With the increasing use of performance-based compensation packages and tax law favoring such compensation design, a natural question arises as to whether workers do indeed perform for pay. We examine this question in a setting that is not fraught with the typical measurement and identification problems found in many pay-performance settings. Specifically, we examine changes in a NFL player's *Win Probability Added* (WPA) and *Expected Points Added* (EPA) in response to his compensation-contract design. Overall, our paper provides evidence that players do indeed perform for (properly designed) pay, and has important implications for future work on compensation and incentive-based contract design.

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## 1. Introduction

How to properly compensate and incentivize workers is a central question in contract theory, and is of fundamental importance to academics, practitioners, and regulators alike. Of particular interest is the issue of whether the best output is achieved by way of fixed-rate versus incentive-based compensation. Jensen and Murphy (1990) provide an early empirical study of incentive-based compensation design, finding a link, albeit weak, between performance pay and top-management incentives for CEOs.

Since then, equity-based compensation, bolstered by changes in corporate tax law and governance practice, has become increasingly common among U.S. top executives (Hall and Liebman, 2000).<sup>1</sup> In fact, in 1984, fewer than half of the CEOs of publicly traded U.S. corporations were granted stock or stock options in a given year, and equity-based compensation comprised less than one percent of total CEO pay for the median company (Hall, 2003). By 2014, equity-based compensation accounted for close to 60% of total executive pay for the median firm,<sup>2</sup> and changes in the value of executive stock were as much as fifty times as large as changes in levels of cash compensation (Murphy, 1999; Core and Guay, 2002).

Now, more than twenty-five years after Jensen and Murphy's (1990) seminal work, questions still loom as to whether these incentive-based compensation packages can indeed properly incentivize workers as intended (e.g., see Hall and Murphy, 2003). Overall, a natural question remains as to whether effort and performance truly respond to compensation design, particularly in settings where measurable efforts are noisy predictors of the ultimate output, and

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<sup>1</sup> See also the Internal Revenue Code Section 162(m) of the 1993 Tax Act, which limits the deductibility of non-performance-based compensation exceeding \$1,000,000. See also The Income Equity Act of 2015, for a recent bill assigned to a congressional committee with regard to further limiting the tax deductibility of non-performance-based compensation to \$500,00.

<sup>2</sup> See <https://corpgov.law.harvard.edu/2015/09/15/ceo-and-executive-compensation-practices-2015-edition/>

this question only intensifies among workers in the upper echelons, given their already rewarding salaries, extant wealth, and highly ambitious dispositions.

Our purpose is to explore this seminal question of whether performance meaningfully responds to incentive-based contract design in a setting free of such measurement and identification issues. Specifically, we exploit a novel dataset in the realm of professional sports, which provides far more reliable, individual-specific performance metrics and provides rich variation in the degree of incentive-based contract design. Using this dataset, we study the relation between the incentive-based portion of NFL players' compensation contracts and their changes in performance, measured specifically as their individual contribution to the team's success, as the terms of their contracts evolve.

The objective for these players is straightforward: they are recruited to increase the probability of their team winning. The rules are definitively outlined and exacted by cameras and referees during game play, and players are dis-incentivized from breaking rules due to the penalties they incur for infractions. We are also able to isolate any improvements (or decreases) in performance from skill/effort level as opposed to simple good fortune or unethical behavior using the *Win Probability Added (WPA)* and *Expected Points Added (EPA)* metrics, which are carefully designed to measure each play in a game with regard to how much it increased the team's likelihood of scoring points or winning the game. The EPA and WPA, in particular, are carefully calibrated to account for inter-related conditions in the game, where certain plays can be far more critical than others.

The standard features of a NFL compensation contract include the base salary and the number of years that the player will play for a specific team. In addition to these standard terms, there is an addendum to the contract which receives far greater time and focus during contract

negotiations. The addendum includes all of the various bonuses, any specific stipulations the player or team may have about the player (e.g., a player may negotiate to have a single suite when the team is on the road), and, most importantly, the guaranteed money.

The guaranteed portion of the contract is the most critical figure for agents and players, because it represents the amount of money that the player will receive simply by signing his name on the contract, regardless of what transpires thereafter. The guaranteed portion of the contract is rarely paid in full upfront, and is usually paid over the course of a contract to lessen the cap hit imposed by the NFL-NFLPA Collective Bargaining Agreement. Nonetheless, the total guaranteed amount itself cannot be altered. In addition, there are various other types of bonuses stipulating that a player should receive X dollars should he accomplish task Y.

In our sample of 694 NFL compensation contracts signed between 2004 and 2013, we find that the average contract amount is around \$13 million, with an average contract duration of 2.7 years.<sup>3</sup> Of this total contract size, we observe substantial cross-sectional variation in the portion of the total contract amount that is guaranteed, ranging from 0% to a sample maximum of 100% (untabulated). Specifically, in our sample, close to 60 percent of contracts do not allow any portion to be guaranteed, and 20 percent of contracts guarantee more than 33% of the total contract amount.

To explore the performance implications of these differences in incentive-based compensation design, we examine the performance differential between those players with a greater guaranteed portion and those with a greater incentive-based portion. If incentive-based compensation design does not truly motivate individuals, particularly those with already high levels of total compensation, then we should not observe a meaningful difference in the change in

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<sup>3</sup> For reference, the median total compensation for S&P 500 CEOs in 2014 was approximately \$11.3 million. See, for instance, <https://corpgov.law.harvard.edu/2015/09/15/ceo-and-executive-compensation-practices-2015-edition> for details.

performance metrics surrounding contract initiations in the “high-incentive” group versus those in the “low-incentive” group.

We find that the average change in a player’s WPA (EPA) surrounding the contract year is 30.7% (10.95 points) lower when more than 33 percent of his contract value is guaranteed than when it is not. Nonetheless, the possibility remains that our results simply reflect mean reversion rather than the efficacy of incentive-based contract design. That is, perhaps players who are able to negotiate greater fixed portions in their contract design have enjoyed an unusual run up in their performances, and thus, are bound to face a natural reversal. If ex-post performances reflect a superstar’s inevitable mean reversion rather than performance for pay, then other contract terms that come with superstar status, such as the total size or length of the contract, should also impact subsequent performance differentials.

To the contrary, neither the size nor the length of the contract is reliably associated with changes in a player’s WPA or EPA. However, the incentive-based composition of the compensation contract continues to be a significant determinant of subsequent performance, suggesting that our findings are indeed driven by players’ performance incentives rather than by mean reversion. That is, controlling for the contract size and length, the average change in a player’s WPA (EPA) surrounding the contract year is 36.9% (10.40 points) lower when more than 33 percent of the contract value is guaranteed than when it is not.

Overall, the evidence we provide suggests that NFL players do indeed perform for pay, lending support to the more general idea that incentive-based compensation design meaningfully affects performance and output, even among those in the upper echelons of total wealth and compensation. As such, our paper bridges an important gap in the literature, and nicely complements Adams and Ferreira (2008), who find that board meeting attendance increases when

directors' compensation design includes a "pay per meeting" clause, despite the fact that the meeting fee is only \$1,000 and represents very little of the director's overall pay or wealth. Given the similarities in incentive design within our sample (e.g., many NFL contracts include clauses regarding attendance during the off-season), our findings suggest that such clauses can have substantial performance implications. Moreover, our findings are further solidified by that fact that the EPA and WPA metrics are free from deceptive alternations by athletes, in contrast to earnings and even stock prices, which are temporarily manipulable by executives (Dallas, 2011; Denis, Hanouna, and Sarin, 2006).

This paper is organized as follows. In Section 2, we provide additional background and details with regard to NFL contract design, and we provide sample excerpts. In Section 3, we describe the WPA and EPA performance metrics in greater detail, and in Section 4, we describe our data sources, define our main variables of interest, and provide key summary statistics. In Sections 5 and 6, we present our empirical analyses, and in Section 7, we discuss and conclude.

## **2. NFL Contract Design**

The typical NFL contract begins with a widely adopted set of 25 paragraphs, starting with the term of the contract (i.e., number of seasons) in paragraph 1, and proceeding to outline the player's yearly salary in paragraph 5. Appendix B presents an excerpt from a sample NFL contract, specifically, between Arian Foster and the Houston Texans in 2012.<sup>4</sup> Overall, the first 24 paragraphs contain standardized language defining the legal terms of a player's employment in conjunction with his salary, as it pertains generally to publicity, injury, integrity, and other permissible activities, to name a few.

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<sup>4</sup> Obtained from: [https://www.sec.gov/Archives/edgar/data/1573683/000104746913009713/a2216998zex-10\\_3.htm](https://www.sec.gov/Archives/edgar/data/1573683/000104746913009713/a2216998zex-10_3.htm)

In addition to these standard terms, the 25<sup>th</sup> paragraph is reserved for special provisions, i.e., the attachments and addenda, which describe the actual details of the player's compensation design. Specifically, the addendum specifies the guaranteed portion of the contract, which represents the most critical portion of the player's contract, as it is guarantees a certain portion of compensation to the player that cannot be altered irrespective of subsequent behaviors or outcomes. Appendix C presents a sample addendum to a NFL contract specifying the guaranteed portion of the contract. As is standard practice, this addendum outlines the payment schedule of the guaranteed compensation, which is typically paid throughout the term of the contract to reduce the team's cap hit.

The addendum can also include stipulations for other types of bonuses or salary de-escalators (i.e., reductions). Some bonuses are simple. For example, many contracts feature a roster bonus, which is paid if the player remains on the active roster list at some pre-specified date(s) in the future (as is shown in Appendix D). A number of contracts also include off-season bonuses or de-escalators, providing an incentive for players to participate in a minimum percentage of team-organized off-season workouts (as is shown in Appendix E). Incentive bonuses are also predicated on a player's performance on the field. For example, Cameron Wake, the Miami Dolphins' defensive end, had a \$1 million salary escalator in his most recent contract, to be paid contingent on achieving 13 sacks.<sup>5</sup>

Many contracts also attach options for either the player or the team, which if exercised, dictate that the contract be renewed for the following year. For instance, Arizona Cardinals' defensive back, Deone Bucannon, is currently serving out a four-year contract signed in 2014. The

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<sup>5</sup> *Agent's Take: Notable players who cashed in on performance bonuses.* <http://www.cbssports.com/nfl/news/agents-take-notable-players-who-cashed-in-on-performance-bonuses/>

Cardinals have a club option in 2018 to extend the contract for an additional season.<sup>6</sup> Many such contracts include an option bonus, which is to be paid if the option is exercised. Finally, the addendum can include stipulations for various additional player services, such as for a mandatory minimum number of charitable appearances or the autographing of memorabilia (as in shown in Appendix F).

### **3. NFL Performance Metrics: WPA and EPA**

Now a widespread performance metric in sports analytics, the *Win Probability Added* (WPA) measures the change in win probability that is attributed to a particular play. That is, the WPA assesses each play, and thus each player involved, by the extent to which it increased or decreased the team's likelihood of winning the game. Similarly, the *Expected Points Added* (EPA) measures the change in expected points that is attributed to a particular play. Thus, a player's annual performance metric can be aggregated as the total WPA and total EPA across all of his plays throughout the year. Much like the WAR (i.e., Wins Above Replacement) metric in sabermetrics, the WPA and EPA metrics are intended in spirit to isolate the individual impact of a specific player. That is, the intent of these measures is to assess the extent to which each play benefits from the particular player in question as opposed to another average player in the league.

Unlike blunter metrics, such as yards gained during a play, WPA and EPA provide a much more sophisticated and context-driven metric of a player's performance on the field. That is, although yards gained is an important determinant of a player's performance, the context in which those yards are gained is crucial to the degree in which those yards increase the team's likelihood of success. Specifically, in football, the offensive team has four chances (i.e., downs) to advance,

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<sup>6</sup> <http://www.rotoworld.com/recent/nfl/9591/deone-bucannon>

in total, ten yards. Thus, a four-yard gain on the third down with four yards remaining (i.e., on third down and four) is far more likely to ultimately yield points for the team than a four-yard gain on the third down with eight yards remaining (i.e., on third down and eight). Accordingly, a play involving a four-yard gain on third down and four will accrue a greater WPA and EPA than a play involving a four-yard gain on third down and eight.

WPA and EPA are not always positive, as a player's actions during the course of a play may decrease the team's likelihood of winning or scoring points. That is, win probabilities and expected points will decrease when a player throws an interception or loses yards during a play. Similar to how increases in win probabilities and expected points are determined, the decreases in win probabilities and expected points are also highly context dependent. For instance, losing one yard on fourth down and one is far more damaging than losing one yard on third down and one.

Furthermore, unlike earnings or short-term stock prices, the WPA and EPA performance metrics are not manipulable by players. The official rules of the game are comprehensively outlined, and enforced by cameras and referees throughout the game. Players are penalized for infractions, and thus, are dis-incentivized from breaking these rules given the scrutiny under which they are placed. Thus, unlike the problems identified in the setting of executive performance/pay, we have a reliable setting in which to test the performance implications of incentive-based contract design.

#### **4. Data Sources and Description of Variables**

In this section, we describe our data sources and regression variables, we describe the typical elements of a NFL player's compensation contract, and we present basic summary statistics.

#### 4.1. Sources

We focus on non-rookie NFL contract initiations for the quarterback, running back, tight end, and wide receiver positions, which we collect from the NFL Positional Payrolls section of Spotrac.com,<sup>7</sup> the largest online purveyor of professional sports contracts. We focus specifically on these positions because they are the key players eligible to advance the ball through the course of a typical play. We focus on non-rookie contracts so that we can study performance changes relative to terms in the new contract, which allows us to effectively net out player-specific fixed effects.

From each of these NFL compensation contracts, we extract: (i) the contract amount; (ii) the signing bonus; (iii) the portion of the total contract amount that is guaranteed; and (iv) the length of the contract (in years). For each of these players, we also collect the *Win-Probability Added* (WPA) and *Expected Points Added* (EPA) over time, which we extract from a combination of ESPN and Advanced Football Analytics, a comprehensive source NFL player performance metrics and statistical models for consensus player rankings.<sup>8</sup> In addition, we collect information on player injuries from player biographies obtained from a combination of ESPN and Wikipedia, since injuries naturally affect a player's WPA and EPA, which can only be accrued through play time. Overall, our sample spans 694 NFL-player contracts originating between 2004 and 2013, along with each player's WPA and EPA performance metrics in the two years preceding and two years directly following each contract initiation.

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<sup>7</sup> See [www.spotrac.com/nfl/positional/](http://www.spotrac.com/nfl/positional/)

<sup>8</sup> At the time of data collection, we obtained players' WPA and EPA metrics from a combination of <http://www.espn.com/nfl> and <http://wp.advancedfootballanalytics.com/playerstats.php>. Since then, ESPN has acquired all licensing to Advanced Football Analytics, which has ceased to operate independently.

#### *4.2. Contract Initiation and Average Performance Statistics*

In Table 1, we present the number of contract initiations in our sample by year (Panel A) as well as by position played (Panel B). Overall, we have contract initiations for 62 quarterbacks, 130 running backs, 171 tight ends, and 331 wide receivers.

In Table 2, we present the average WPA and EPA over time (Panel A) and across positions (Panel B). We report both the performance metric for the year prior to the contract initiation, as well as for the year directly following the contract initiation. We observe that, on average, players' WPAs and EPAs decline in the year following the contract initiation relative to the year preceding the contract initiation.

#### *4.3. Average Terms of NFL Compensation Contracts*

In Table 3, we present summary statistics on key contract metrics (Panel A). The average length of a contract is 2.68 years, with a median of 2.0 years. Overall, the average total compensation package amounts to roughly \$13 million, with a median of \$4.2 million. On average, 13 percent of this total contract size is guaranteed. However, there is substantial variation in this element of contract design, where the median guaranteed portion is 0 percent. In fact, in our sample, 415 contracts (59.8%) guarantee 0 percent of the contract amount, and 138 contracts (19.9%) guarantee more than 33 percent [untabulated].

We also present average performance metrics in the years surrounding contract initiation (Panels B.1 and B.2). For instance, the average WPA in the year prior to contract initiation is 0.43, and the average WPA in the year immediately following contract initiation is 0.40 (Panel B.1). Likewise, the average EPA in the year prior to contract initiation is 14.88 points, and the average EPA in the year immediately following contract initiation is 12.97 points (Panel B.2).

In examining contract terms based on prior WPA and EPA, which we present in Table 4, we observe that contract size, length, signing bonus, and the overall portion that is guaranteed vary with a player's prior performance. For instance, in the lowest quartile of performance measured by the player's WPA in the prior year, the average total contract size is \$9.7 million, with an average guarantee of 11 percent and average length of 2.31 years (Panel A.1). In contrast, players in the highest quartile of prior WPA enjoyed an average total contract size of \$24.8 million, with an average guarantee of 20 percent and average length of 3.78 years. We make similar observations when we sort past performance by the average WPA in the two years prior to contract initiation (Panel A.2), as well as when we sort past performance by a player's EPA (Panels B.1 and B.2).

Overall, these findings suggest that past performance is a meaningful predictor of the total contract amount, length, signing bonus, and overall portion that is guaranteed at contract initiation. A natural question now arises as to whether subsequent effort and performance is meaningfully affected by compensation design, particularly given the high levels of compensation. We now proceed to explore this question in greater detail.

## **5. Empirical Results: Changes in Performance Based on Contract Design**

To explore whether contract design motivates subsequent performance, we begin by examining average changes in performance based on the guaranteed fraction of the contract at initiation. Specifically, we group the contracts into three categories: (1) contracts with no amount guaranteed; (2) contracts with less than 33% of the amount guaranteed; and (3) contracts with greater than 33% of the amount guaranteed. Our choice of the 33% cutoff was motivated by the conditional median guaranteed portion of 32.53% within the subsample of contracts with a non-zero guaranteed

amount.<sup>9</sup> Within each of these categories, we calculate the average change in WPA and the average change in EPA in the years directly surrounding contract initiation.

The results, which we present in Table 5, show substantially negative performance changes for players with more than 33% of their contract amount guaranteed. For instance, these players exhibit a 28.7% decline ( $p$ -value = 0.00) in WPA in the year following contract initiation compared to the year directly preceding (Panel A.1), and they exhibit an 10.531 point decline ( $p$ -value = 0.00) in EPA in the year following contract initiation compared to the year directly preceding (Panel B.1). We also observe substantial declines when we compare the two-year performance averages surrounding contract initiation for these players (Panels A.2 and B.2),<sup>10</sup> and we observe that the differences in average performance changes across the lowest and highest incentivized players is statistically and economically meaningful.

To the contrary, players without such large portions of guaranteed compensation do not exhibit meaningfully different changes in performance. For instance, these players with no guaranteed compensation exhibit an average change in WPA of 0.5% ( $p$ -value = 0.91) in the year following contract initiation compared to the year directly preceding (Panel A.1), and they exhibit an average change in EPA of -0.151 points ( $p$ -value = 0.91) in the year following contract initiation compared to the year directly preceding (Panel B.1).

Overall, the results thus far suggest that players with high portions of guaranteed compensation are no longer motivated to perform optimally, whereas those players with low

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<sup>9</sup> Our results are equally robust to using cutoffs of 30% and 32% (rather than a 33% cutoff). Our results are also robust to using a 20% or 40% cutoff.

<sup>10</sup> We note that our total sample size declines from 694 to 399 when we explore differences in two-year performance averages surrounding the contract year due to the following reasons. First, due to data limitations at the time of collection, we naturally lose all 109 contracts in the 2013 contract year when attempting to analyze two-year pre-versus post-contract performance changes. Second, we lose an additional 186 contracts because: (i) many players are not still contracted players more than one year after the contract year; and (ii) for some players, the contract year occurs within one year of their rookie contract

portions of guaranteed compensation are incentivized to continue to put forth their best efforts and performances. However, the possibility remains that these differences simply reflect the inevitable mean reversion of overvalued players who were able to command greater portions of guaranteed compensation. To explore this possibility, we begin by examining performance changes based on other contract terms at initiation that also relate to negotiating power, but do not promote the same incentive alignment, as is the case with the duration of the contract and the total contract amount.

The results, which we present in Tables 6 and 7, show mixed results surrounding these performance implications. With regard to the length of the contract (Table 6), a longer contract duration does not reliably associate with changes in WPA (Panels A.1 and A.2), though the differences in average performance change between the shorter versus longer contract durations are statistically and economically meaningful. We observe stronger associations with regard to changes in EPA, whereby contract duration reliably associates with changes in EPA (Panels B.1 and B.2). For instance, players with contracts capped at two years exhibit an average change in WPA of 2.3% ( $p$ -value = 0.58), and those with contracts longer than two years exhibit an average change in WPA of -10.6% ( $p$ -value = 0.11). In comparison, players with contracts capped at two years exhibit an average change in EPA of 0.468 points ( $p$ -value = 0.72), and those with contracts longer than two years exhibit an average change in EPA of -4.792 points ( $p$ -value = 0.01).

We make similar observations with regard to total contract size (Table 7). That is, players in the lowest quartile of total compensation experience an average change in WPA of 6.1% ( $p$ -value = 0.16), and those in the highest quartile experience an average change in WPA of -8.1% ( $p$ -value = 0.48). In comparison, the average change in EPA of these players is 2.313 points ( $p$ -value = 0.08) and -6.561 points ( $p$ -value = 0.04) in the lowest and highest quartiles of total compensation, respectively.

Overall, the results thus far suggest that the total contract amount as well as the contract length also contribute, albeit weakly, to subsequent differences in players' performance metrics. However, contract terms are likely to be related. That is, a player who can command a large contract amount, is also likely to command a longer contract length as well as a greater guaranteed portion. To explore this idea, we examine the average portion guaranteed within quartiles of total contract size as well as within two buckets of contract length, split along those contracts drawn for at most two years versus those drawn for greater than two years.

The results, which we present in Table 8, show that, on average, the guaranteed portion increases with total contract amount and contract length, and also, to some extent, with prior performance. For instance, the average guaranteed portion is 24 percent in the highest quartile of contract size, as opposed to 1 percent in the lowest quartile of contract size. Similarly, the average guaranteed portion is 21 percent for contracts lasting longer than two years, as opposed to 6 percent for contracts less than or equal to two years in length, and the average guaranteed portion is 20 percent (20 percent) in the highest quartile of prior WPA (EPA), as opposed to 11 percent (10 percent) in the lowest quartile of prior WPA (EPA).

However, we notice a substantial amount of variation in the portion guaranteed within each of these sorted buckets. For instance, in the highest quartile of contract size, the contracts in the 25<sup>th</sup> and 75<sup>th</sup> percentiles along the guaranteed portion, guarantee 0 percent and 40 percent of the total contract amount, respectively. Similarly, among the contracts greater than three years in length, the contracts in the 25<sup>th</sup> and 75<sup>th</sup> percentiles along the guaranteed portion, guarantee 0 percent and 37 percent of the total contract amount, respectively, and among contracts for players in the highest quartile of past WPA (EPA), the contracts in the 25<sup>th</sup> and 75<sup>th</sup> percentiles along the guaranteed portion, guarantee 0 percent (0 percent) and 40 percent (37 percent), respectively.

Finally, we note that contract years may naturally predicate a greater likelihood of mean reversion, because (i) contracts may be proffered after particularly successful performance, and (ii) players may have a proclivity to put forth a burst of effort toward the end of the previous contract to lock in a new contract, after which he allows his effort to decline. Consistent with this interpretation, we observe an overall negative change in performance surrounding the contract signing, with average decline of 3.4% in WPA ( $t$ -statistic = -0.91) and 1.901 in EPA ( $t$ -statistic = -1.72) [untabulated]. We now proceed to our multivariate analyses to disentangle the possibly competing effects of the incentive-based portion of the contract versus natural mean reversion, team effects, and other contract characteristics.

## 6. Multivariate Analyses

To disentangle these alternative interpretations, we now turn to multivariate analyses relating performance changes to various factors. That is, if ex-post performance declines simply reflect a superstar's mean reversion rather than performance for pay, then in multivariate analyses, other contract terms that come with superstar status, such as the total size or length of the contract, should also impact subsequent performance differentials. Thus, to disentangle these alternative interpretations, we estimation the following pooled OLS regression:

$$\begin{aligned} \Delta Performance_{i,t} = & \alpha + \beta \cdot Incentive\ Metric_{i,t} + Other\ Contract\ Terms_{i,t} \times \gamma \\ & + Player\ Characteristics_{i,t} \times \gamma + Win\ Percentage_{i,t-1} \times \delta \\ & + Team_{i,t} \times \theta + \varphi \cdot Post2011_{i,t} \end{aligned} \quad (1)$$

$\Delta Performance_{i,t}$ , the dependent variable, is the change in player  $i$ 's performance, as measured by either: (i) the change in his *Win Probability Added (WPA)* or (ii) the change in his *Expected Points Added (EPA)* in the years directly surrounding contract initiation.

*Incentive Metric* $_{i,t}$  is measured as either: (i) as the *Fraction of Contract Guaranteed* $_{i,t}$ , which represents the fraction of the total contract value that is guaranteed; or (ii) as *Low Incentive-Based Contract* $_{i,t}$ , which equals one if more than 33% of the contract is guaranteed, and zero otherwise. *Other Contract Terms* $_{i,t}$  is a vector of the following contract terms: *Log Contract Amount* $_{i,t}$ , which is the natural log of the total contract value in dollars; and *Length of Contract* $_{i,t}$ , which is the duration of the contract in years.

In addition, *Player Characteristics* $_{i,t}$  is a vector of the following player characteristics: *Log Player Age* $_{i,t}$ , which is the natural log of a player's age in years;<sup>11</sup> *Injured Flag* $_{i,t}$ , which equal ones if player  $i$  is injured during the contract year, and zero otherwise; *Career Average WPA [or EPA]* $_{i,t}$ , which is player  $i$ 's career-average WPA (or career-average EPA); *Quarterback (QB)* $_{i,t}$ , which equals one if the contract originated is for the position of quarterback, and zero otherwise; *Wide Receiver (WR)* $_{i,t}$ , which equals one if the contract originated is for the position of wide receiver, and zero otherwise; *Running Back (RB)* $_{i,t}$ , which equals one if the contract originated is for the position of running back, and zero otherwise.

We also control for the quality of the team as well as team fixed effects, since a player's efforts on the field can be complemented or undermined by his teammates. Specifically, *Win Percentage* $_{i,t-1}$  is the percentage of games won by player  $i$ 's current team in the prior season,<sup>12</sup> and *Team* $_{i,t}$  is a vector of team indicators for each of the 32 teams in our sample. Finally, we include a *Post-2011* $_{i,t}$  indicator for contracts originated during or after 2011, because of critical issues in NFL labor negotiations marked by this time period. Specifically, major disagreements in labor negotiations during 2011 results in a NFL player lockout from March through July 2011, after

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<sup>11</sup> Our results are robust to controlling for the player's tenure (i.e., number of years in the NFL) rather than his age.

<sup>12</sup> Our results are also robust to controlling for the team's change in win percentage rather than their win percentage in the prior season.

which a new collective bargaining agreement was instated by the beginning of the regular 2011 season.

The results, which we present in Table 9, show that neither the size nor the length of the contract is reliably associated with changes in a player's WPA or EPA. However, the incentive-based composition of the compensation contract continues to be a significant determinant of subsequent performance. That is, controlling for other contract characteristics as well as the player's age, career-average performance, and quality of the player's team, the average change in a player's WPA surrounding contract initiation is 36.9% lower ( $t$ -statistic = -3.40) when more than 33 percent of the contract value is guaranteed than when it not (Table 9, Column 4). Similarly, the average change in a player's EPA surrounding contract initiation is 10.4 points lower ( $t$ -statistic = -3.27) when more than 33 percent of the contract value is guaranteed than when it is not (Table 9, Column 8), suggesting that these results are indeed driven by players' performance incentives rather than by mean reversion.

Furthermore, we note that in examining performance changes surrounding non-rookie contract initiations, we effectively net out player-specific fixed effects. Along this regard, we also examine performance changes surrounding contract renewals in which the player is re-signed within the same team as an additional check providing for ceteris-paribus conditions from the year prior to the year after contract renewal. We have 155 such contract renewals in our sample [untabulated], and we find that the *Fraction of Contract Guaranteed* and the *Low Incentive-Based Contract* dummy are meaningful predictors of negative performance changes surrounding these contract renewals.

Overall, the results suggest that a player's effort and subsequent performance is meaningfully and substantially affected by compensation design, as measured by the incentive-based portion of his contract.

## **7. Conclusion**

In this paper, we provide evidence that NFL players meaningfully respond to compensation design, with substantial changes in players' individual performance metrics following greater incentive-based contract design. In an analogous setting, empirical evidence indicates that board meeting attendance improves when directors' compensation design includes a "pay per meeting" clause (Adams and Ferreira, 2008), suggesting improved effort (and possibly improved performance) due to increased incentive alignment or signaling based on compensation design.

However, empirical challenges lie in how to directly tie these differences in compensation design to an executive's or a director's performance added, which is inherently difficult to assess through firm performance outcomes. For instance, large cross-sections guarantee that a few CEOs will be repeatedly lucky or unlucky (Kim, Eberhart, and Armanios, 2016), and extreme, positive outcomes may even be the result of negative judgment (Denrell, 2005; Denrell and Fang, 2010; Denrell and Liu, 2012). Conversely, extreme, negative outcomes may result despite undertaking actions similar to those of firms that did not proceed to experience similar hardships (Khanna and Poulsen, 1995). Given the similarities in incentive design within our sample, including attendance-based pay, our results indicate that such incentive clauses may indeed have substantial performance implications.

To be clear, much work is required before we can arrive to more definitive conclusions as to the extent to which compensation packages should be fixed or variable, as well as to the general

desirability and efficacy of incentive-based compensation design. Our paper provides a compelling evidence in this direction, and bridges an important gap in the literature as to whether effort and performance in general respond meaningfully to incentive-based compensation design, particularly in the upper echelons of total wealth and status.

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## Appendix A. Definition of Variables

Presented below a list of regression variables with corresponding definitions.

### Contract Terms:

<i>Contract Amount</i>	The total dollar value of the contract, including both guaranteed and incentive-based portions.
<i>Signing Bonus</i>	The dollar amount promised at contract initiation, irrespective of subsequent events.
<i>Guaranteed Amount</i>	The dollar amount of the contract that is guaranteed.
<i>Length of Contract</i>	The duration of the contract in years.

### Performance Metrics:

<i>Expected Points Added (EPA)</i>	A player's total annual <i>EPA</i> calculated as the sum of the <i>EPAs</i> of each play made by the player throughout the year. The <i>EPA</i> of each play is measured as the change in a team's <i>expected points</i> attributed to that particular play.
<i>Win Probability Added (WPA)</i>	A player's total annual <i>WPA</i> calculated as the sum of the <i>WPAs</i> of each play made by the player throughout the year. The <i>WPA</i> of each play is measured as the change in a team's <i>win probability</i> attributed to that particular play.

### Position Played:

<i>Quarterback</i>	The key player positioned just behind the offensive line, and who receives the ball from the center at the start of the play.
<i>Running Back</i>	The other back(s) who are positioned behind the offensive line and stand ready to receive the ball to execute a rushing play.
<i>Tight End</i>	The player(s) who are positioned on the two ends of the offensive line.
<i>Receiver</i>	The player(s) who specialize in catching passes, and is positioned either along or behind the offensive line.

### Other Player Characteristics:

<i>Player Age</i>	The player's age in years.
<i>Injured Flag</i>	Captures whether the player is injured in the contract year.

### Team Characteristics:

<i>Lagged Win Percentage</i>	The percentage of games won by the player's team in the prior season.
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## Appendix B. Sample NFL-Player Contract

Provided below is an excerpt from the first 24 paragraphs from a sample NFL contract, specifically, between Arian Foster and the Houston Texans in 2012

EX-10.3 9 a2216998zex-10\_3.htm EX-10.3

Exhibit 10.3

### NFL PLAYER CONTRACT

THIS CONTRACT is between Arian Foster, hereinafter "Player," and Houston NFL Holdings, L.P., a Delaware corporation (limited partnership) (partnership), hereinafter "Club" operating under the name of the Houston Texans as a member of the National Football League, hereinafter "League." In consideration of the promises made by each to the other, Player and Club agree as follows:

1. **TERM.** This contract covers 5 football season(s), and will begin on the date of execution or March 1, 2012, whichever is later, and end on February 28 or 29, 2017, unless extended, terminated, or renewed as specified elsewhere in this contract.

2. **EMPLOYMENT AND SERVICES.** Club employs Player as a skilled football player. Player accepts such employment. He agrees to give his best efforts and loyalty to the Club, and to conduct himself on and off the field with appropriate recognition of the fact that the success of professional football depends largely on public respect for and approval of those associated with the game. Player will report promptly for and participate fully in Club's official mandatory mini-camp(s), official preseason training camp, all Club meetings and practice sessions, and all pre-season, regular season, and post-season football games scheduled for or by Club. If invited, Player will practice for and play in any all-star football game sponsored by the League. Player will not participate in any football game not sponsored by the League unless the game is first approved by the League.

3. **OTHER ACTIVITIES.** Without prior written consent of the Club, Player will not play football or engage in activities related to football otherwise than for Club or engage in any activity other than football which may involve a significant risk of personal injury. Player represents that he has special, exceptional and unique knowledge, skill, ability, and experience as a football player, the loss of which cannot be estimated with any certainty and cannot be fairly or adequately compensated by damages. Player therefore agrees that Club will have the right, in addition to any other right which Club may possess, to enjoin Player by appropriate proceedings from playing football or engaging in football-related activities other than for Club or from engaging in any activity other than football which may involve a significant risk of personal injury.

4. **PUBLICITY AND NFLPA GROUP LICENSING PROGRAM.** (a) Player grants to Club and the League, separately and together, the authority to use his name and picture for publicity and the promotion of NFL Football, the League or any of its member clubs in newspapers, magazines, motion pictures, game programs and roster manuals, broadcasts and telecasts, and all other publicity and advertising media, provided such publicity and promotion does not constitute an endorsement by Player of a commercial product. Player will cooperate with the news media, and will participate upon request in reasonable activities to promote the Club and the League. Player and National Football League Players Association, hereinafter "NFLPA," will not contest the rights of the League and its member clubs to telecast, broadcast, or otherwise transmit NFL Football or the right of NFL Films to produce, sell, market, or distribute football game film footage, except insofar as such broadcast, telecast, or transmission of footage is used in any commercially marketable game or interactive use. The League and its member clubs, and Player and the NFLPA, reserve their respective rights as to the use of such broadcasts, telecasts or transmissions of footage in such games or interactive uses, which shall be unaffected by this subparagraph.

(b) Player hereby assigns to the NFLPA and its licensing affiliates, if any, the exclusive right to use and to grant to persons, firms, or corporations (collectively "licensees") the right to use his name, signature facsimile, voice, picture, photograph, likeness, and/or biographical information (collectively "image") in group licensing programs. Group licensing programs are defined as those licensing programs in which a licensee utilizes a total of six (6) or more NFL player images on or in conjunction with products, (including, but not limited to, trading

cards, clothing, videogames, computer games, collectibles, internet sites, fantasy games, etc.) that are sold at retail or used as promotional or premium items. Player retains the right to grant permission to a licensee to utilize his image if that licensee is not concurrently utilizing the images of five (5) or more other NFL player on products that are sold at retail or are used as promotional or premium items. If Player's inclusion in a particular NFLPA program is precluded by an individual exclusive endorsement agreement, and Player provides the NFLPA with timely written notice of that preclusion, the NFLPA will exclude Player from that particular program. In consideration for this assignment of rights, the NFLPA will use the revenues it receives from group licensing programs to support the objectives as set forth in the By-laws of the NFLPA. The NFLPA will use its best efforts to promote the use of NFL player images in group licensing programs, to provide group licensing opportunities to all NFL players, and to ensure that no entity utilizes the group licensing rights granted to the NFLPA without first obtaining a license from the NFLPA. This subparagraph (b) shall be construed under Virginia law without reference to conflicts of law principles. The assignment in this paragraph shall expire on December 31 of the later of (a) the third year following the execution of this contract, or (b) the year in which this contract expires. Neither Club nor the League is a party to the terms of this paragraph, which is included herein solely for the administrative convenience and benefit of Player and the NFLPA. The terms of this subparagraph apply unless, at the time of execution of this contract, Player indicates by striking out this subparagraph (b) and marking his initials adjacent to the stricken language his intention not to participate in the NFLPA Group Licensing Program. Nothing in this subparagraph shall be construed to supersede or any way broaden, expand, detract from, or otherwise alter in any way whatsoever, the rights of NFL Properties, Inc. as permitted under Article V (Union Security), Section 4 of the 1993 Collective Bargaining Agreement.

5. COMPENSATION. For performance of Player's services and all other promises of Player, Club will pay Player a yearly salary as follows:

\$5,000,000 for the 2012 season;

\$5,250,000 for the 2013 season;

\$5,750,000 for the 2014 season;

\$6,000,000 for the 2015 season;

\$6,500,000 for the 2016 season.

In addition, Club will pay Player such earned performance bonuses as may be called for in this contract; Player's necessary traveling expenses from his residence to training camp; Player's reasonable board and lodging expenses during pre-season training and in connection with playing pre-season, regular season, and post-season football games outside Club's home city; Player's necessary traveling expenses to and from pre-season, regular season, and post-season football games outside Club's home city; Player's necessary traveling expenses to his residence if this contract is terminated by Club; and such additional compensation, benefits, and reimbursement of expenses as may be called for in any collective bargaining agreement in existence during the term of this contract. (For purposes of this contract, a collective bargaining agreement will be deemed to be in existence" during its stated term or during any period for which the parties to that agreement agree to extend it.)

6. PAYMENT. Unless this contract or any collective bargaining agreement in existence during the term of this contract specifically provides otherwise, Player will be paid 100% of his yearly salary under this contract in equal weekly or bi-weekly installments over the course of the applicable regular season period, commencing with the first regular season game played by Club in each season. Unless this contract specifically provides otherwise, if this contract is executed or Player is activated after the beginning of the regular season, the yearly salary payable to Player will be reduced proportionately and Player will be paid the weekly or bi-weekly portions of his yearly salary becoming due and payable after he is activated. Unless this contract specifically provides otherwise, if this contract is terminated after the beginning of the regular season, the yearly salary payable to Player will be reduced proportionately and Player will be paid the weekly or bi-weekly portions of his yearly salary having become due and payable up to the time of termination.

7. DEDUCTIONS. Any advance made to Player will be repaid to Club, and any properly levied Club fine or Commissioner fine against Player will be paid, in cash on demand or by means of deductions from payments coming due to the Player under this contract, the amount of such deductions to be determined by Club unless this contract or any collective bargaining agreement in existence during the term of this contract specifically provides otherwise.

8. PHYSICAL CONDITION. Player represents to Club that he is and will maintain himself in excellent physical condition. Player will undergo a complete physical examination by the Club physician upon Club request, during which physical examination Player agrees to make full and complete disclosure of any physical or mental condition known to him which might impair his performance under this contract and to respond fully and in good faith when questioned by the Club physician about such condition. If Player fails to establish or maintain his excellent physical condition to the satisfaction of the Club physician, or make the required full and complete disclosure and good faith responses to the Club physician, then Club may terminate this contract.

9. INJURY. Unless this contract specifically provides otherwise, if Player is injured in the performance of his services under this contract and promptly reports such injury to the Club physician or trainer, then Player will receive such medical and hospital care during the term of this contract as the Club physician may deem necessary, and will continue to receive his yearly salary for so long, during the season of injury only and for no subsequent period covered by this contract, as Player is physically unable to perform the services required of him by this contract because of such injury. If Player's injury in the performance of his services under this contract results in his death, the unpaid balance of his yearly salary for the season of injury will be paid to his stated beneficiary, or in the absence of a stated beneficiary, to his estate.

10. WORKERS' COMPENSATION. Any compensation paid to Player under this contract or under any collective bargaining agreement in existence during the term of this contract for a period during which he is entitled to workers' compensation benefits by reason of temporary total, permanent total, temporary partial, or permanent partial disability will be deemed an advance payment of workers' compensation benefits due Player, and Club will be entitled to be reimbursed the amount of such payment out of any award of workers' compensation.

11. SKILL, PERFORMANCE AND CONDUCT. Player understands that he is competing with other players for a position on Club's roster within the applicable player limits. If at any time, in the sole judgement of Club, Player's skill or performance has been unsatisfactory as compared with that of other players competing for positions on Club's roster, or if Player has engaged in personal conduct reasonably judged by Club to adversely affect or reflect on Club, then Club may terminate this contract. In addition, during the period any salary cap is legally in effect, this contract may be terminated if, in Club's opinion, Player is anticipated to make less of a contribution to Club's ability to compete on the playing field than another player or players who Club intends to sign or attempts to sign, or another player or players who is or are already on Club's roster, and for whom Club needs room.

12. TERMINATION. The rights of termination set forth in this contract will be in addition to any other rights of termination allowed either party by law. Termination will be effective upon the giving of written notice, except that Player's death, other than as a result of injury incurred in the performance of his services under this contract, will automatically terminate this contract. If this contract is terminated by Club and either Player or Club so requests, Player will promptly undergo a complete physical examination by the Club physician.

13. INJURY GRIEVANCE. Unless a collective bargaining agreement in existence at the time of termination of this contract by Club provides otherwise, the following injury grievance procedure will apply: If Player believes that at the time of termination of this contract by Club he was physically unable to perform the services required of him by this contract because of an injury incurred in the performance of his services under this contract, Player may, within 60 days after examination by the Club physician, submit at his own expense to examination by a physician of his choice. If the opinion of Player's physician with respect to his physical ability to perform the services required of him by this contract is contrary to that of the Club's physician, the dispute will be submitted within a reasonable time to final and binding arbitration by an arbitrator selected by Club and Player or, if they are unable to agree, one selected in accordance with the procedures of the American Arbitration Association on application by either party.

14. RULES. Player will comply with and be bound by all reasonable Club rules and regulations in effect during the term of this contract which are not inconsistent with the provisions of this contract or of any collective bargaining agreement in existence during the term of this contract. Player's attention is also called to the fact that the League functions with certain rules and procedures expressive of its operation as a joint venture among its member clubs and that these rules and practices may affect Player's relationship to the League and its member clubs independently of the provisions of this contract.

15. INTEGRITY OF GAME. Player recognizes the detriment to the League and professional football that would result from impairment of public confidence in the honest and orderly conduct of NFL games or the integrity and good character of NFL players. Player therefore acknowledges his awareness that if he accepts a bribe or agrees to throw or fix an NFL game; fails to promptly report a bribe offer or an attempt to throw or fix an NFL game; bets on an NFL game; knowingly associates with gamblers or gambling activity; uses or provides other players with stimulants or other drugs for the purpose of attempting to enhance on-field performance; or is guilty of any other form of conduct reasonably judged by the League Commissioner to be detrimental to the League or professional football, the Commissioner will have the right, but only after giving Player the opportunity for a hearing at which he may be represented by counsel of his choice, to fine Player in a reasonable amount; to suspend Player for a period certain or indefinitely; and/or to terminate this contract.

16. EXTENSION. Unless this contract specifically provides otherwise, if Player becomes a member of the Armed Forces of the United States or any other country, or retires from professional football as an active player, or otherwise fails or refuses to perform his services under this contract, then this contract will be tolled between the date of Player's induction into the Armed Forces, or his retirement, or his failure or refusal to perform, and the later date of his return to professional football. During the period this contract is tolled, Player will not be entitled to any compensation or benefits. On Player's return to professional football, the term of this contract will be extended for a period of time equal to the number of seasons (to the nearest multiple of one) remaining at the time the contract was tolled. The right of renewal, if any, contained in this contract will remain in effect until the end of any such extended term.

17. ASSIGNMENT. Unless this contract specifically provides otherwise, Club may assign this contract and Player's services under this contract to any successor to Club's franchise or to any other Club in the League. Player will report to the assignee Club promptly upon being informed of the assignment of his contract and will faithfully perform his services under this contract. The assignee club will pay Player's necessary traveling expenses in reporting to it and will faithfully perform this contract with Player.

18. FILING. This contract will be valid and binding upon Player and Club immediately upon execution. A copy of this contract, including any attachment to it, will be filed by Club with the League Commissioner within 10 days after execution. The Commissioner will have the right to disapprove this contract on reasonable grounds, including but not limited to an attempt by the parties to abridge or impair the rights of any other club, uncertainty or incompleteness in expression of the parties' respective rights and obligations, or conflict between the terms of this contract and any collective bargaining agreement then in existence. Approval will be automatic unless, within 10 days after receipt of this contract in his office, the Commissioner notifies the parties either of disapproval or of extension of this 10-day period for purposes of investigation or clarification pending his decision. On the receipt of notice of disapproval and termination, both parties will be relieved of their respective rights and obligations under this contract.

19. DISPUTES. During the term of any collective bargaining agreement, any dispute between Player and Club involving the interpretation or application of any provision of this contract will be submitted to final and binding arbitration in accordance with the procedure called for in any collective bargaining agreement in existence at the time the event giving rise to any such dispute occurs.

20. NOTICE. Any notice, request, approval or consent under this contract will be sufficiently given if in writing and delivered in person or mailed (certified or first class) by one party to the other at the address set forth in this contract or to such other address as the recipient may subsequently have furnished in writing to the sender.

21. OTHER AGREEMENTS. This contract, including any attachment to it, sets forth the entire agreement between Player and Club and cannot be modified or supplemented orally. Player and Club represent that

no other agreement, oral or written, except as attached to or specifically incorporated in this contract, exists between them. The provisions of this contract will govern the relationship between Player and Club unless there are conflicting provisions in any collective bargaining agreement in existence during the term of this contract, in which case the provisions of the collective bargaining agreement will take precedence over conflicting provisions of this contract relating to the rights or obligations of either party.

22. LAW. This contract is made under and shall be governed by the laws of the State of Texas.

23. WAIVER AND RELEASE. Player waives and releases any claims that he may have arising out of, related to, or asserted in the lawsuit entitled White v. National Football League, including, but not limited to, any such claim regarding past NFL Rules, the College Draft, Plan B, the first refusal/compensation system, the NFL Player Contract, pre-season compensation, or any other term or condition of employment, except any claims asserted in Brown v. Pro Football, Inc. This waiver and release also extends to any conduct engaged in pursuant to the Stipulation and Settlement Agreement in White ("Settlement Agreement") during the express term of that Settlement Agreement or any portion thereof. This waiver and release shall not limit any rights Player may have to performance by the Club under this Contract or Player's rights as a member of the White class to object to the Settlement Agreement during its review by the court in Minnesota. This waiver and release is subject to Article XIV (NFL Player Contract), Section 3(c) of the 1993 Collective Bargaining Agreement (CBA).

24. OTHER PROVISIONS. (a) Each of the undersigned hereby confirms that (i) this Contract, renegotiation, extension or amendment sets forth all components of the player's remuneration for playing professional football (whether such compensation is being furnished directly by the Club by a related or affiliated entity); and (ii) there are not undisclosed agreements of any kind, whether expressed or implied, oral or written, and there are no promises, undertakings, representations, commitments, inducements, assurances of intent, or understandings of any kind that have not been disclosed to the NFL involving consideration of any kind to be paid, furnished or made available to Player or any entity or person owned or controlled by, affiliated with, or related to Player, either during the term of this contract or thereafter.

(b) Each of the undersigned further confirms that, except insofar as any of the undersigned may describe in an addendum to this contract, to the best of their knowledge, no conduct in violation of the Anti-Collusion rules of the Settlement Agreement took place with respect to this contract. Each of the undersigned further confirms that nothing in this contract is designed or intended to defeat or circumvent any provisions of the Stipulation and Settlement Agreement in White v. NFL, including but not limited to the Rookie Pool and Salary Cap provisions; however, any conduct permitted by the CBA and/or the Settlement Agreement shall not be considered a violation of this confirmation.

(c) The Club further confirms that any information regarding the negotiation of this contract that it provided to the Neutral Verifier was, at the time the information was provided, true and correct in all material respects.

25. SPECIAL PROVISIONS.

See Attachments

THIS CONTRACT is executed in six (6) copies. Player acknowledges that before signing this contract he was given the opportunity to seek advice from or be represented by persons of his own selection.

/s/ Arian Foster  
PLAYER Arian Foster

CLUB Houston Texans

Home Address

/s/ Christian Olsen  
By Christian Olsen  
Vice President of Football Administration

Club Address Two Reliant Park  
Houston TX 77054

Telephone Number

3/6/12  
Date

3/6/12  
Date

/s/ Michael McCartney  
PLAYER'S CERTIFIED AGENT  
Michael McCartney  
Priority Sports & Entertainment  
Address  
325 N. LaSalle Street Suite 650  
Chicago, IL 60654  
Telephone Number  
(312) 664-7700  
Date 3-6-12

Copy Distribution:      White-League Office      Yellow-Player      Green-Member Club  
                                 Blue-Management Council      Gold-NFLPA      Pink-Player Agent

## Appendix C. Sample Addendum to a NFL-Player Contract: The Signing Bonus

Provided below is an excerpt from the Signing Bonus Addendum to a compensation contract between Arian Foster and the Houston Texans in 2012

### Signing Bonus Addendum to NFL Player Contract

This Signing Bonus Addendum (the "Agreement"), dated as of **March 6, 2012**, is between **ARIAN FOSTER** ("Player") and **Houston NFL Holdings, L.P.** ("Club"), and is attached and made a part for all purposes of the NFL Player Contract of even date herewith between Player and Club (the "Contract") for the League Years **2012-2016** (the "Contract Year(s)").

1. As additional consideration for the execution of the Contract for the Contract Years, for Player's receiving medical clearance to practice and play after taking Club's physical examination, Club agrees to pay Player the sum of **Twelve Million Five Hundred Thousand and No/100 Dollars (\$12,500,000.00)** as a signing bonus (the "Signing Bonus"), payable as follows:

Amount:	Due and Payable:
\$ 3,125,000	Within fifteen (15) days after March 15, 2012;
\$ 1,562,500	Within five (5) days after September 15, 2012;
\$ 1,562,500	Within five (5) days after December 15, 2012;
\$ 6,250,000	Within five (5) days after March 25, 2013

2. Player's entitlement to the Signing Bonus is expressly conditional on Player's receiving medical clearance to practice and play after taking the physical examination. Player's entitlement to the Signing Bonus and Player's obligation to forfeit and return (or relinquish and forego) the Signing Bonus shall be governed exclusively by the terms of Article 4, Section 9 of the Collective Bargaining Agreement, dated August 4, 2011. Payment of the Signing Bonus prior to Player's passing Club's physical examination shall not be a waiver of the condition that he receive medical clearance to practice and play.

3. It is expressly understood that no part of the Signing Bonus is part of any salary specified in the Contract, that the Signing Bonus shall not be deemed part of any salary specified in the Contract if Club exercises any option for Player's services in a Contract Year subsequent to the final Contract Year, and that such obligations of Club are not terminable if the Contract is terminated for skill or injury via the NFL Waiver System, provided that Player has not breached the terms of the Contract or this Agreement prior to such Contract termination.

4. Forfeiture of Signing Bonus. Player shall be subject to forfeiture of Salary to the maximum extent permitted under Article 4, Section 9 of the CBA, dated August 4, 2011. For the purposes of this Agreement, Salary refers to the Signing Bonus payable to player as described above.

5. It is understood and agreed that Player's waiver of rights to certain unpaid and/or unearned amounts and Player's obligation to repay or refund certain portions of the Signing Bonus in the event Player breaches hereunder are express conditions of the Contract and this Agreement, and, but for these conditions, Club would not have executed the Contract and this Agreement. Player hereby expressly authorizes Club, in its sole discretion, to deduct and off set, at any time and from time to time, all or part of any sums owed by Player to Club from any current, future or deferred wages, salaries, bonuses, severance pay, grievance awards and/or additional compensation owed to Player by Club. Such deductions will be made in accordance with Article 4, Section 9 of the CBA, dated August 4, 2011. In the event the full outstanding amount owed to Club cannot be satisfied by authorized deductions from amounts owed to, or coming due to, Player as set forth above, then Club shall retain all available rights and remedies to compel immediate payment.

## Appendix D. Sample Addendum to a NFL-Player Contract: The Roster Bonus

Provided below is an example of a Roster Bonus Addendum extracted from a compensation contract between Arian Foster and the Houston Texans in 2012

Page 5  
2012-2016 ATTACHMENT (continued)

**35. 2012-2016 Forty-Six (46) Man Active Roster Bonuses.**

Player will receive a bonus in the amount of **Thirty-One Thousand Two Hundred Fifty and No/100 Dollars (\$31,250.00)** (each a “Game Roster Bonus” and collectively the “2012-2016 Roster Bonuses”) for each of the sixteen (16) games during each of the 2012-2016 Regular Seasons that he is a member of the Club’s 46-Man Active Roster, commencing with Game 1 of each such Regular Season. Each Game Roster Bonus, if earned, will be paid concurrent with Player’s Paragraph 5 salary during the Regular Season. **The maximum amount Player can earn under this Paragraph 35 is Five Hundred Thousand and No/100 Dollars (\$500,000.00) for each of the 2012-2016 League Years. THE MAXIMUM AMOUNT PLAYER CAN EARN UNDER THIS PARAGRAPH 35 FOR THE ENTIRE TERM OF THIS CONTRACT (2012-2016 LEAGUE YEARS) IS TWO MILLION FIVE HUNDRED THOUSAND AND NO/100 DOLLARS (\$2,500,000.00).**

Notwithstanding anything to the contrary herein, if, during any League Year, Club participates in more than sixteen (16) Regular Season games, then Player will receive an amount for each game he is a member of Club’s 46-Man Active Roster equal to **Five Hundred Thousand and No/100 Dollars (\$500,000.00)** divided by the number of Regular Season games in the applicable League Year(s). For example, if Club participates in eighteen (18) Regular Season games in the 2016 League Year, then Player will receive **Twenty-Seven Thousand Seven Hundred Seventy Seven and 77/100 Dollars (\$27,777.77)** for each Regular Season game he is a member of the Club’s 46-man Active Roster.

It is expressly understood that no part of any Game Roster Bonus is part of any salary specified in the Contract, that the Game Roster Bonus shall not be deemed part of any salary specified in the Contract if Club exercises any option for Player’s services in a League Year subsequent to the final League Year, and that such obligations of Club are not terminable via the NFL Waiver System, provided that Player has not defaulted under or breached the terms of the Contract, including this Attachment, prior to such Contract termination.

Player shall be subject to forfeiture of Salary to the maximum extent permitted under Article 4, Section 9 of the CBA, dated August 4, 2011. For the purposes of this Paragraph, Salary refers to the 2012-2016 Roster Bonuses payable to Player as described above.

Player hereby expressly authorizes Club, in its sole discretion with prior notice to Player, to deduct and offset, at any time and from time to time, all or part of any sums owed by Player to Club hereunder from any current or deferred wages, salaries, bonuses and/or additional compensation owed to Player by Club. Such deductions will be made in accordance with Article 4, Section 9(h) of the CBA, dated August 4, 2011. If the full outstanding amount owed to Club cannot be satisfied by such deductions as set forth above, then Club shall retain all available rights and remedies to compel immediate payment.

PLAYER	AF	CLUB	CO
INITIAL	_____	INITIAL	_____
DATE	<u>3/6/12</u>	DATE	<u>3/6/12</u>

## Appendix E. Sample Addendum to a NFL-Player Contract: Salary De-Escalator

Provided below is an example of a Salary De-Escalator Addendum extracted from a compensation contract between Arian Foster and the Houston Texans in 2012

**Page 6**  
**2012-2016 ATTACHMENT (continued)**

**36. 2013-2016 Paragraph 5 Salary De-Escalator.**

For each of the 2013 through 2016 League Years, if Player fails to fully satisfy any of the following conditions:

(a) Player satisfactorily participates in and completes Club's "Off-Season Program". For the purposes of this Contract, Player shall be deemed to have satisfactorily participated in and completed Club's "Off-Season Program" under the following circumstances:

(i) Player has satisfactorily completed participation in at least eight (8) of the nine (9) total weeks of Club's scheduled "Off-Season Program", including any Club mandatory mini-camp(s); and

(ii) Calculation of Player's number of weeks of completion will be based upon the completion of four (4) total days in each week of Club's nine (9) week "Off-Season Program" as prescribed by the Club's Head Strength and Conditioning Coach or his designated staff member. Any workouts in excess of four (4) days per week and workouts performed before or after the Club's nine (9) week "Off-Season Program" will not count towards the calculation of credited participation and completion; and

(iii) Player's workout schedule and successful completion of such workouts will be determined solely by Club's Head Strength and Conditioning Coach and any schedule changes must be approved by the Club's Head Strength and Conditioning Coach or the Head Athletic Trainer as soon as practicable; or

(b) Player timely reports to and fully participates in Club's entire off-season mandatory Veteran mini-camp(s); or

(c) Player timely reports to and fully participates in the Club's entire pre-season training camp(s); or

(d) From the execution of this Contract until the Tuesday immediately preceding Club's first (1st) Regular Season game of each League Year (2013-2016), Player otherwise honors all of his contractual obligations to Club,

THEN, Player's Paragraph 5 Salary for that League Year shall be reduced by **One Hundred Thousand and No/100 Dollars (\$100,000.00)**. Nothing contained in this Paragraph 36 will constitute a guarantee of any portion of Player's Paragraph 5 Salary included in the Contract.

If Player is unable to participate fully and satisfactorily in the "Off-Season Program" due to injury, Player must rehabilitate such injury as required by and under the supervision of Club's Head Athletic Trainer until such time as full participation in the "Off-Season Program" can be achieved. Supervised rehabilitation by Player with Club's Head Athletic Trainer will count towards Player's eight (8) week completion requirement. Player's satisfactory participation in the "Off-Season Program" shall be determined solely upon records maintained by Club, which shall be final and binding on the parties.

**37. 409A Requirements.**

Except to the extent that an intent to be subject to Section 409A is expressly set forth in the Contract, this Contract shall be interpreted and administered consistent with the intent that all compensation payable hereunder shall be exempt from the requirements of Section 409A of the Internal Revenue Code by reason of the "short-term deferral" rule set forth in Treas. Reg. § 1.409A-1(b)(4). No payment shall be made after the "applicable 2-1/2 month period" (as defined in Treas. Reg. § 1.409A-1(b)(4)(i)(A)).

PLAYER	AF	CLUB	CO
INITIAL	_____	INITIAL	_____
DATE	<u>3/6/12</u>	DATE	<u>3/6/12</u>

## Appendix F. Sample Addendum to a NFL-Player Contract: Additional Player Services

Provided below is an example of an Addendum for Additional Player Services extracted from a compensation contract between Arian Foster and the Houston Texans in 2012

**ATTACHMENT TO  
NFL PLAYER CONTRACT (“CONTRACT”) BETWEEN  
ARIAN FOSTER (“PLAYER”)  
AND  
HOUSTON TEXANS (“CLUB”)  
2012-2016**

### **26. Additional Player Services.**

As additional consideration for the compensation provided to Player in the Contract, Player agrees to provide Club with certain promotional services as requested by Club from time to time for no additional compensation, including without limitation:

- (a) Player agrees to perform up to a maximum of **four (4) hours** of service on the Houston Texans Internet Web Site (www.houstontexans.com), (or such other site as may be designated by Club) each month during the term of the Contract. Club and Player will mutually agree on dates and times of service.
- (b) Player agrees to fulfill a minimum of **eight (8)** charitable or public relations/ promotion-related requests for Club during each League Year, provided Club makes the request with reasonable notice to Player and Player does not have any conflict with the date and time of the request. Player will make reasonable efforts to accommodate Club’s requests. These requests may include, but are not limited to, speaking engagements and personal appearances as a representative of Club.
- (c) Player agrees to autograph items and memorabilia for Club charitable or public relations/promotional use as reasonably requested by appropriate Club officials.

### **27. Media and Marketing.**

- (a) During the term of the Contract, Club and Player agree to work and cooperate with one another in good faith with respect to all Club media and marketing activities. To that end:
  - (i) If Player is offered an opportunity to sponsor or endorse a product, service or entity, Player will give Club notice of such offer. If a Substantial Club Sponsor in the applicable category offers Player an opportunity to sponsor or endorse its products, services or entity, and all compensation and other benefits as between the other offer and the offer made by the Substantial Club Sponsor are equal or substantially and materially similar, Player agrees to give greater favor to the Substantial Club Sponsor (which term shall include any sponsor in one of the Designated Categories listed on Exhibit A attached hereto).
  - (ii) If Player is offered a media opportunity (such as a regularly-scheduled program, show or similar opportunity on television, radio or the Internet (or other interactive media) or similar media, Player will give Club notice of such offer. If a Club Media Partner offers Player a similar media opportunity and all compensation and other benefits as between the other offer and the offer made by Club Media Partner (which term shall include any Club radio, television or other media entity that carries or broadcasts Club’s games or programs/specials) are equal or substantially and materially similar, Player agrees to give greater favor to Club Media Partner.
  - (iii) Player agrees to work proactively and cooperate with Club to reach agreements with respect to Substantial Club Sponsors and Club Media Partners on a commercially reasonable basis prior to commencing discussions with any competitors of such Substantial Club Sponsor or Club Media Partner.

Club will use its commercially reasonable efforts to ensure that Player receives competitive compensation and other benefits so that all such compensation and benefits will be equal or substantially and materially similar to competitive market arrangements.

(b) Notwithstanding the foregoing, this marketing limitation shall not apply with respect to any current sponsorship or endorsement arrangement of Player in effect as of the date of the Contract, which sponsorships and endorsements are listed on Exhibit A attached hereto and shall continue until termination or expiration by their terms.

(c) In no event shall Player be obligated to do any such marketing or media activity not in his best interest as objectively and reasonably advised by his marketing representative or legal counsel.

(d) Player agrees to refrain from engaging in any marketing or media activity, other than through Club, that would reasonably infer Club's sponsorship or endorsement of such activity, including without limitation, use of Club's name, logo, mark, color or other symbol identifying Club.

PLAYER            AF  
INITIAL            \_\_\_\_\_

CLUB            CO  
INITIAL            \_\_\_\_\_

DATE 3/6/12

DATE 3/6/12

Table 1. Contract Initiation by Year and by Position

This table presents the incidence of contract initiations and average contract values over time, across our sample of 694 NFL-player contracts originating between 2004 and 2013, inclusive. Panel A presents contract frequencies by year, and Panel B presents contract frequencies by players' positions. The *Contract value* represents the total dollar value of the contract, including both guaranteed and incentive-based components, and the *Fraction of the Contract Guaranteed* represents the fraction of the total contract value that is guaranteed.

Contract Year	Average Contract Value	Average Fraction of Contract Guaranteed	Frequency	Percent (%)	Cumulative Freq.	Cumulative Pct.
Panel A. Contract Initiations by Year						
2004	\$35,641,000	0.09	23	3.31	23	3.31
2005	\$22,778,870	0.08	34	4.9	57	8.21
2006	\$19,384,128	0.06	39	5.62	96	13.83
2007	\$15,812,857	0.11	35	5.04	131	18.88
2008	\$17,112,696	0.12	56	8.07	187	26.95
2009	\$15,847,141	0.15	64	9.22	251	36.17
2010	\$9,649,789	0.10	95	13.69	346	49.86
2011	\$10,645,766	0.15	115	16.57	461	66.43
2012	\$10,435,956	0.17	124	17.87	585	84.29
2013	\$6,568,879	0.14	109	15.71	694	100.00
Total	694	694	694	694	---	---
Position	Average Contract Value	Average Fraction of Contract Guaranteed	Frequency	Percent (%)		
Panel B. Contract Initiations by Position Played						
Quarterback	\$37,933,135	0.20	62	8.93	---	---
Running Back	\$13,609,835	0.13	130	18.73	---	---
Tight End	\$7,514,745	0.11	171	24.64	---	---
Wide Receiver	\$10,939,846	0.12	331	47.69	---	---
Total	694	694	694	100.00	---	---

Table 2. Performance Statistics by Year and by Position

This table presents the average performance metrics over time, across our sample of 694 NFL-player contracts originating between 2004 and 2013. Panel A presents average performance metrics by year, and Panel B presents average performance metrics by players' positions. *Win Probability Added (WPA)* is the player's total annual *WPA* across all of his plays, where the *WPA* of each play is measured as the change in win probability attributed to a particular play. *Expected Points Added (EPA)* is the player's total annual *EPA* across all of his plays, where the *EPA* of each play is measured as the change in expected points attributed to a particular play.

Contract Year	Frequency	Win Probability Added (WPA)		Expected Points Added (EPA)	
		Year Prior to Contract	Year Following Contract	Year Prior to Contract	Year Following Contract
Panel A. Average Performance Metrics by Year					
2004	23	1.03	0.86	27.1	26.0
2005	34	0.55	0.88	21.4	29.5
2006	39	0.51	0.63	19.4	18.7
2007	35	0.32	0.33	13.0	12.1
2008	56	0.50	0.38	17.2	11.8
2009	64	0.62	0.47	20.3	15.4
2010	95	0.47	0.35	15.4	12.2
2011	115	0.25	0.27	8.1	9.4
2012	124	0.41	0.33	15.0	11.2
2013	109	0.33	0.31	11.4	9.0
Total obs.	694	694	694	694	694
Position	Frequency	Win Probability Added (WPA)		Expected Points Added (EPA)	
		Year Prior to Contract	Year Following Contract	Year Prior to Contract	Year Following Contract
Panel B. Average Performance Metrics by Position Played					
Quarterback	62	1.20	1.02	48.2	38.6
Running Back	130	0.04	0.03	-2.2	-5.5
Tight End	171	0.27	0.23	9.7	8.6
Wide Receiver	331	0.53	0.51	18.0	17.7
Total obs.	694	694	694	694	694

Table 3. Contract Value, Duration, and Key Performance Metrics

This table presents summary statistics on compensation contracts and key performance metrics across our sample of 694 NFL-player contracts originating between 2004 and 2013. Panel A presents summary statistics on contract value and duration. Panels B.1 and B.2 present summary statistics on player performance metrics, with Panel B.1 presenting the *Win Probability Added* (WPA) and Panel B.2 presenting the *Expected Points Added* (EPA). With regard to contract size, certainty, and duration: *Contract Amount* is the total dollar value of the contract, including both guaranteed and incentive-based components; *Signing Bonus* is the dollar amount promised at contract initiation, irrespective of what transpires thereafter; *Guaranteed Amount* is dollar amount of the contract that is guaranteed; *Fraction of the Contract Guaranteed* is fraction of the total contract value that is guaranteed; and *Length of Contract* is the duration of the contract in years. With regard to performance metrics: *Win Probability Added* (WPA) is the player's total annual WPA across all of his plays, where the WPA of each play is measured as the change in win probability attributed to a particular play. *Expected Points Added* (EPA) is the player's total annual EPA across all of his plays, where the EPA of each play is measured as the change in expected points attributed to a particular play.

Variable	Mean	25 <sup>th</sup> percentile	Median	75 <sup>th</sup> percentile
Panel A. Contract Value, Certainty, and Duration				
Contract Amount	\$13,007,555	\$966,000	\$4,175,000	\$17,500,000
Signing Bonus	\$2,191,100	\$0	\$40,000	\$3,000,000
Guaranteed Amount	\$3,001,145	\$0	\$0	\$2,250,000
Fraction of the Contract Guaranteed	0.13	0.00	0.00	0.27
Length of Contract	2.68	1.00	2.00	4.00
Panel B.1. Player Performance Metrics: Win Probability Added (WPA)				
Average WPA for the two years prior to contract origination	0.47	0.00	0.27	0.82
WPA for the year prior to contract origination	0.43	-0.04	0.20	0.77
WPA for the year after contract origination	0.40	-0.05	0.15	0.72
Average WPA for the two years after contract origination	0.48	-0.02	0.32	0.85
Panel B.2. Player Performance Metrics: Expected Points Added (EPA)				
Average EPA for the two years prior to contract origination	15.19	0.35	8.75	26.15
EPA for the year prior to contract origination	14.88	-1.00	7.30	26.30
EPA for the year after contract origination	12.97	-1.30	5.60	20.80
Average EPA for the two years after contract origination	16.00	-0.80	9.50	28.10
No. of observations	694	---	---	---

Table 4. Contract Terms by Performance Prior to Contract Initiation

This table presents summary statistics on compensation size, duration, and certainty within quartiles of prior performance across our sample of 694 NFL-player contracts originating between 2004 and 2013. Performance quartiles are determined by either prior *WPA* (Panels A.1 and A.2) or prior *EPA* (Panels B.1 and B.2). With regard to contract size, certainty, and duration: *Contract Amount* is the total dollar value of the contract, including both guaranteed and incentive-based components; *Signing Bonus* is the dollar amount promised at contract initiation, irrespective of what transpires thereafter; *Guaranteed Amount* is the dollar amount of the contract that is guaranteed; *Fraction of the Contract Guaranteed* is the fraction of the total contract value that is guaranteed; and *Length of Contract* is duration of the contract in years. With regard to performance metrics: *Win Probability Added (WPA)* is the player's total annual *WPA* across all of his plays, where the *WPA* of each play is measured as the change in win probability attributed to a particular play. *Expected Points Added (EPA)* is the player's total annual *EPA* across all of his plays, where the *EPA* of each play is measured as the change in expected points attributed to a particular play.

Performance Rank	Prior Performance	Contract Amount	Guaranteed Amount	Length of Contract	Fraction of Contract Guaranteed	Signing Bonus
Panel A.1. Contract Terms by WPA in the Year Prior to the Contract						
Lowest	-0.38	\$9,707,163	\$1,947,602	2.31	0.11	\$1,577,023
2	0.07	\$5,559,436	\$996,233	1.92	0.06	\$791,087
3	0.45	\$11,885,623	\$2,721,888	2.72	0.14	\$1,788,124
Highest	1.59	\$24,755,979	\$6,308,550	3.78	0.20	\$4,579,671
No. of obs.	694	---	---	---	---	---
Panel A.2. Contract Terms by average WPA in the Two Years Prior to the Contract						
Lowest	-0.20	\$5,638,175	\$879,432	1.93	0.09	\$1,025,247
2	0.16	\$7,988,658	\$1,860,563	2.32	0.12	\$1,299,106
3	0.50	\$14,646,363	\$3,534,028	3.03	0.14	\$2,260,377
Highest	1.39	\$25,648,615	\$6,104,830	3.74	0.20	\$4,857,141
No. of obs.	612	---	---	---	---	---
Panel B.1. Contract Terms by EPA in the Year Prior to the Contract						
Lowest	-11.8	\$9,651,029	\$1,672,590	2.38	0.10	\$1,667,055
2	2.4	\$4,953,482	\$1,005,376	1.86	0.06	\$689,227
3	15.2	\$11,960,744	\$2,956,180	2.75	0.15	\$1,918,333
Highest	53.8	\$25,517,571	\$6,382,231	3.76	0.20	\$4,500,043
No. of obs.	694	---	---	---	---	---
Panel B.2. Contract Terms by average EPA in the Two Years Prior to the Contract						
Lowest	-7.4	\$7,370,591	\$1,471,979	2.08	0.10	\$1,350,151
2	4.8	\$6,296,230	\$1,381,086	2.17	0.10	\$1,127,928
3	15.7	\$13,488,818	\$2,874,870	2.95	0.14	\$1,930,961
Highest	48.3	\$26,747,315	\$6,645,680	3.80	0.22	\$5,032,075
No. of obs.	612	---	---	---	---	---

Table 5. Changes in Player Performance Based on Percentage of Contract Guaranteed

This table presents changes in players' performance metrics surrounding the year of contract initiation across our sample of 694 NFL-player contracts originating between 2004 and 2013. Average and median changes in performance are reported based on the percentage of the contract value that is guaranteed. Changes in performance metrics are determined by either changes in *WPA* contract origination (Panels A.1 and A.2) or changes in *EPA* contract origination (Panels B.1 and B.2). *Win Probability Added (WPA)* is the player's total annual *WPA* across all of his plays, where the *WPA* of each play is measured as the change in win probability attributed to a particular play. *Expected Points Added (EPA)* is the player's total annual *EPA* across all of his plays, where the *EPA* of each play is measured as the change in expected points attributed to a particular play. *P*-values testing whether the performance changes are reliability different from zero are presented in brackets to the right. The final row of each panel also displays the differences in means and medians between groups (1) and (3), whereby statistical significance between differences in medians in assessed via a median two-sample test. Significance levels at 10%, 5%, and 1% are denoted by \*, \*\*, and \*\*\*, respectively.

Portion Guaranteed	Number of Observations	Average Performance Change	Median Performance Change	P-value of...	
				T-Test	Signed Rank Test
Panel A.1. WPA in Contract Year -- Minus -- WPA in the Year Prior to Contract Year					
(1) None	415	0.005	-0.020	[0.91]	[0.57]
(2) Between 0% and 33%	141	0.087	0.010*	[0.22]	[0.10]
(3) More than 33%	138	-0.281***	-0.180***	[0.01]	[0.01]
Diff. between (1) and (3)	---	-0.286***	-0.160*	[0.01]	[0.07]
Panel A.2. Average WPA in First Two Years of Contract -- Minus -- the Average WPA in the Two Years Prior to Contract Year					
(1) None	227	0.008	0.000	[0.86]	[0.74]
(2) Between 0% and 33%	76	0.077	0.068	[0.32]	[0.12]
(3) More than 33%	96	-0.182**	-0.098**	[0.02]	[0.03]
Diff. between (1) and (3)	---	-0.190**	-0.098	[0.03]	[0.33]
Panel B.1. EPA in Contract Year -- Minus -- EPA in the Year Prior to Contract Year					
(1) None	415	-0.151	0.000	[0.91]	[0.82]
(2) Between 0% and 33%	141	1.523	0.600	[0.45]	[0.50]
(3) More than 33%	138	-10.680***	-6.900***	[0.00]	[0.00]
Diff. between (1) and (3)	---	-10.529***	-6.900***	[0.00]	[0.00]
Panel B.2. Average WPA in First Two Years of Contract -- Minus -- the Average WPA in the Two Years Prior to Contract Year					
(1) None	227	0.022	-1.150	[0.99]	[0.79]
(2) Between 0% and 33%	76	0.287	0.400	[0.90]	[0.57]
(3) More than 33%	96	-7.097***	-4.250***	[0.01]	[0.01]
Diff. between (1) and (3)	---	-7.119***	-3.100**	[0.01]	[0.03]

Table 6. Changes in Player Performance Based on Length of Contract

This table presents changes in players' performance metrics surrounding the year of contract initiation across our sample of 694 NFL-player contracts originating between 2004 and 2013. Average and median changes in performance are reported based on the length of the contract. Changes in performance metrics are determined by either changes in *WPA* contract origination (Panels A.1 and A.2) or changes in *EPA* contract origination (Panels B.1 and B.2). *Win Probability Added (WPA)* is the player's total annual *WPA* across all of his plays, where the *WPA* of each play is measured as the change in win probability attributed to a particular play. *Expected Points Added (EPA)* is the player's total annual *EPA* across all of his plays, where the *EPA* of each play is measured as the change in expected points attributed to a particular play. *P*-values testing whether the performance changes are reliability different from zero are presented in brackets to the right. The final row of each panel also displays the differences in means and medians between groups (1) and (2), whereby statistical significance between differences in medians in assessed via a median two-sample test. Significance levels at 10%, 5%, and 1% are denoted by \*, \*\*, and \*\*\*, respectively.

Length of Contract	Number of Observations	Average Performance Change	Median Performance Change	P-value of...	
				T-Test	Signed Rank Test
Panel A.1. WPA in Contract Year -- Minus -- WPA in the Year Prior to Contract Year					
(1) Length ≤ 2 years	381	0.023	0.000	[0.58]	[0.44]
(2) Length > 2 years	313	-0.106	-0.090**	[0.11]	[0.05]
Diff. between (1) and (2)	---	-0.129*	-0.090**	[0.09]	[0.04]
Panel A.2. Average WPA in First Two Years of Contract -- Minus -- the Average WPA in the Two Years Prior to Contract Year					
(1) Length ≤ 2 years	170	0.046	0.035	[0.26]	[0.31]
(2) Length > 2 years	229	-0.078	-0.020	[0.14]	[0.31]
Diff. between (1) and (2)	---	-0.124*	-0.055	[0.08]	[0.33]
Panel B.1. EPA in Contract Year -- Minus -- EPA in the Year Prior to Contract Year					
(1) Length ≤ 2 years	381	0.468	0.500	[0.72]	[0.76]
(2) Length > 2 years	313	-4.792***	-2.000**	[0.01]	[0.03]
Diff. between (1) and (2)	---	-5.260**	-2.500**	[0.02]	[0.04]
Panel B.2. Average WPA in First Two Years of Contract -- Minus -- the Average WPA in the Two Years Prior to Contract Year					
(1) Length ≤ 2 years	170	1.988	1.825	[0.18]	[0.30]
(2) Length > 2 years	229	-4.335***	-3.100***	[0.01]	[0.01]
Diff. between (1) and (2)	---	-6.323***	-4.925***	[0.01]	[0.01]

Table 7. Changes in Player Performance Based on Total Contract Value

This table presents changes in players' performance metrics surrounding the year of contract initiation across our sample of 694 NFL-player contracts originating between 2004 and 2013. Average and median changes in performance are reported based on quartiles of total contract value. Changes in performance metrics are determined by either changes in *WPA* surrounding contract origination (Panels A.1 and A.2) or changes in *EPA* contract origination (Panels B.1 and B.2). *Win Probability Added (WPA)* is the player's total annual *WPA* across all of his plays, where the *WPA* of each play is measured as the change in win probability attributed to a particular play. *Expected Points Added (EPA)* is the player's total annual *EPA* across all of his plays, where the *EPA* of each play is measured as the change in expected points attributed to a particular play. *P*-values testing whether the performance changes are reliability different from zero are presented in brackets to the right. The final row of each panel also displays the differences in means and medians between groups (1) and (4), whereby statistical significance between differences in medians in assessed via a median two-sample test. Significance levels at 10%, 5%, and 1% are denoted by \*, \*\*, and \*\*\*, respectively.

Total Amount Rank	Total Contract Amount	No. of Observations	Average Performance Change	Median Performance Change	P-value of...	
					T-Test	Signed Rank Test
Panel A.1. WPA in Contract Year -- Minus -- WPA in the Year Prior to Contract Year						
Lowest	\$653,183	173	0.061	0.000	[0.16]	[0.19]
2	\$2,016,218	174	-0.043	-0.040	[0.44]	[0.52]
3	\$9,711,609	173	-0.076	-0.050*	[0.28]	[0.09]
Highest	\$39,559,266	174	-0.081	-0.010	[0.48]	[0.51]
Hi – Lo	---	---	-0.142	-0.010	[0.24]	[0.86]
Panel A.2. Average WPA in First Two Years of Contract -- Minus -- the Average WPA in the Two Years Prior to Contract Year						
Lowest	\$634,632	57	0.092	0.070**	[0.18]	[0.03]
2	\$1,986,149	85	0.058	0.020	[0.31]	[0.48]
3	\$9,690,313	119	-0.046	-0.055	[0.32]	[0.13]
Highest	\$39,043,603	138	-0.106	-0.008	[0.19]	[0.46]
Hi – Lo	---	---	-0.198	-0.078	[0.14]	[0.15]
Panel B.1. EPA in Contract Year -- Minus -- EPA in the Year Prior to Contract Year						
Lowest	\$653,183	173	2.313*	1.000	[0.08]	[0.13]
2	\$2,016,218	174	-2.974	-0.850*	[0.12]	[0.06]
3	\$9,711,609	173	-0.362	-0.200	[0.85]	[0.70]
Highest	\$39,559,266	174	-6.561**	-2.400*	[0.04]	[0.06]
Hi – Lo	---	---	-8.874***	-3.500*	[0.01]	[0.08]
Panel B.2. Average EPA in First Two Years of Contract -- Minus -- the Average EPA in the Two Years Prior to Contract Year						
Lowest	\$634,632	57	3.810	2.100*	[0.15]	[0.07]
2	\$1,986,149	85	2.594	1.700	[0.16]	[0.31]
3	\$9,690,313	119	-1.089	-3.550	[0.46]	[0.11]
Highest	\$39,043,603	138	-6.976***	-3.575**	[0.01]	[0.02]
Hi – Lo	---	---	-10.786***	-5.675***	[0.01]	[0.00]

Table 8. Variation in Guaranteed Portion Based on Contract Amount, Length, and Prior Performance

This table presents the range in the portion of guaranteed compensation across our sample of 694 NFL-player contracts originating between 2004 and 2013. The *Portion Guaranteed* is the fraction of the total contract value that is guaranteed. *Contract Amount* is the total dollar value of the contract, and *Contract Length* is the duration of the contract in years. *Win Probability Added (WPA)* is the player's total annual WPA across all of his plays, where the WPA of each play is measured as the change in win probability attributed to a particular play. *Expected Points Added (EPA)* is the player's total annual EPA across all of his plays, where the EPA of each play is measured as the change in expected points attributed to a particular play.

Rank	Average Contract Amount	Number of Observations	<i>Portion Guaranteed</i>			
			Average	25 <sup>th</sup> Percentile	Median	75 <sup>th</sup> Percentile
Panel A. Sorted by Total Contract Amount						
Lowest	\$ 653,183	173	0.01	0.00	0.00	0.00
2	\$ 2,016,218	174	0.07	0.00	0.00	0.04
3	\$ 9,711,609	173	0.19	0.00	0.16	0.34
Highest	\$39,559,266	174	0.24	0.00	0.29	0.40
	Average Contract Length	Number of Observations	<i>Portion Guaranteed</i>			
			Average	25 <sup>th</sup> Percentile	Median	75 <sup>th</sup> Percentile
Panel B. Sorted by Contract Length						
Length $\leq$ 2 years	1.22	381	0.06	0.00	0.00	0.00
Length $>$ 2 years	4.47	313	0.21	0.00	0.24	0.37
	Average Prior Performance	Number of Observations	<i>Portion Guaranteed</i>			
			Average	25 <sup>th</sup> Percentile	Median	75 <sup>th</sup> Percentile
Panel C.1. Sorted by WPA in the Year Prior to Contract Year						
Lowest	-0.38	177	0.11	0.00	0.00	0.20
2	0.07	172	0.06	0.00	0.00	0.00
3	0.45	170	0.14	0.00	0.00	0.30
Highest	1.59	175	0.20	0.00	0.17	0.40
Panel C.2. Sorted by EPA in the Year Prior to Contract Year						
Lowest	-11.8	173	0.10	0.00	0.00	0.16
2	2.4	174	0.06	0.00	0.00	0.04
3	15.2	174	0.15	0.00	0.00	0.32
Highest	53.8	173	0.20	0.00	0.15	0.37

Table 9. Changes in Player Performance and Incentive-Based Compensation

This table presents estimates from the following pooled OLS regression:

$$\Delta Performance_{i,t} = \alpha + \beta \cdot Incentive\ Metric_{i,t} + Other\ Contract\ Terms_{i,t} \times \gamma + Player\ Characteristics_{i,t} \times \vartheta + Win\ Percentage_{i,t-1} \times \delta + Team_{i,t} \times \theta + \varphi \cdot Post2011_{i,t} + \varepsilon_{i,t}$$

$\Delta Performance_{i,t}$ , the dependent variable, is the change in player  $i$ 's performance, as measured by the change in his *Win Probability Added (WPA)*, in the years directly surrounding contract initiation across our sample of 694 NFL-player contracts originating between 2004 and 2013.  $\Delta Performance_{i,t}$  is measured in two ways: (i) the WPA in the year of contract initiation minus the WPA in the year prior to contract initiation (Columns 1 through 4); and (ii) the EPA in the year of contract initiation minus the EPA in the year prior to contract initiation (Columns 5 through 8). *Incentive Metric* $_{i,t}$  is measured as either: (i) *Fraction of Contract Guaranteed* $_{i,t}$ , which represents the fraction of the total contract value that is guaranteed; or (ii) *Low Incentive-Based Contract* $_{i,t}$ , which equals one if at least 33% of the contract is guaranteed, and zero otherwise. *Other Contract Terms* $_{i,t}$  is a vector of the following contract terms: *Log Contract Amount* $_{i,t}$ , which is the natural log of the total contract value in dollars; and *Length of Contract* $_{i,t}$ , which is the duration of the contract in years. In addition, *Player Characteristics* $_{i,t}$  is a vector of the following player characteristics: *Log Player Age* $_{i,t}$ , which is the natural log of the player's age in years; *Injured Flag* $_{i,t}$  which equals one if player  $i$  is injured during the contract year, and zero otherwise; *Career Average WPA [or EPA]* $_{i,t}$ , which is player  $i$ 's career-average WPA (in Columns 2 and 4) or career-average EPA (in Columns 6 and 8); *Quarterback (QB)* $_{i,t}$ , which equals one if the contract originated is for the position of quarterback, and zero otherwise; *Wide Receiver (WR)* $_{i,t}$ , which equals one if the contract originated is for the position of wide receiver, and zero otherwise; and *Running Back (RB)* $_{i,t}$ , which equals one if the contract originated is for the position of running back, and zero otherwise. *Win Percentage* $_{i,t-1}$  is the percentage of games won by player  $i$ 's current team in the prior season. *Team* $_{i,t}$  is a vector of team indicators for each of the 32 teams in our sample, and *Post-2011* $_{i,t}$  is an indicator that equals one for contracts originated during or after 2011, and zero otherwise.  $T$ -statistics are presented below in parentheses, and significance levels at 10%, 5%, and 1% are denoted by \*, \*\*, and \*\*\*, respectively.

Variable	Coefficient Estimate ( $p$ -value)							
	Dep Var = $WPA_{i,t} - WPA_{i,t-1}$				Dep Var = $EPA_{i,t} - EPA_{i,t-1}$			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>Contract Terms:</b>								
<i>Fraction of Contract Guaranteed</i> $_{i,t}$	-0.461** (-2.30)	-0.549* (-2.21)			-17.527*** (-3.00)	-15.403** (-2.11)		
<i>Low Incentive-Based Contract</i> $_{i,t}$			-0.307*** (-3.27)	-0.369*** (-3.40)			-10.954*** (-4.01)	-10.397*** (-3.27)
<i>Log Contract Amount</i> $_{i,t}$		0.026 (0.41)		0.036 (0.60)		0.332 (0.18)		0.644 (0.36)

<i>Length of Contract</i> <sub><i>i,t</i></sub>		-0.036 (-0.76)		-0.039 (-0.83)		-1.103 (-0.80)		-1.190 (-0.87)
Team Characteristics:								
<i>Win Percentage</i> <sub><i>i,t-1</i></sub>		-1.139*** (-4.71)		-1.138*** (-4.73)		-30.501*** (-4.30)		-30.468*** (-4.31)
Player Characteristics:								
<i>Log Player Age</i> <sub><i>i,t</i></sub>		-0.933** (-2.17)		-0.958** (-2.24)		-22.224* (-1.76)		-22.950* (-1.83)
<i>Injured Flag</i> <sub><i>i,t</i></sub>		-0.246** (-2.17)		-0.249** (-2.21)		-7.613** (-2.29)		-7.704** (-2.33)
<i>Career Average WPA [or EPA]</i> <sub><i>i,t</i></sub>		0.173* (1.91)		0.180** (1.99)		0.123* (1.67)		0.127* (1.74)
<i>Quarterback (QB) Indicator</i> <sub><i>i,t</i></sub>		-0.142 (-0.85)		-0.139 (-0.84)		-7.065 (-1.44)		-6.988 (-1.44)
<i>Wide Receiver (WR) Indicator</i> <sub><i>i,t</i></sub>		-0.032 (-0.34)		-0.033 (-0.34)		-0.090 (-0.03)		-0.097 (-0.03)
<i>Running Back (RB) Indicator</i> <sub><i>i,t</i></sub>		0.012 (0.10)		0.020 (0.23)		-1.084 (-0.31)		-0.811 (-0.23)
<i>Post-2011 Indicator</i> <sub><i>i,t</i></sub>		0.019 (0.23)		0.018 (0.23)		-0.180 (-0.07)		-0.189 (-0.08)
<i>Intercept</i>	0.025 (0.54)	3.294** (2.33)	0.026 (0.63)	3.221** (2.30)	0.355 (0.27)	80.396* (1.94)	0.275 (0.23)	78.219* (1.90)
Team Dummies	No	Yes	No	Yes	No	Yes	No	Yes
Adjusted R-Squared	0.006	0.051	0.014	0.061	0.011	0.041	0.021	0.050
Number of Observations	694	694	694	694	694	694	694	694