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Compensation of College Football's Head Coaches: A Case Study in Firm Size's Effects on Pay

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Abstract

Top management pay and firm size has been well documented. We explore a variation of this relationship by extending it to college sports. College football is big business, and many college football programs operate as large corporations with the head coach acting as a member of top management—similar to the COO—of the football program. Using data from 2006-2012, we examine the causal relationship between a head coach's school pay, past performance, and football program size. Our results indicate the most important determinant of a head coach's pay is the total revenue generated by the football program.

Keywords: firm size, compensation, head coach, football, college

Introduction

Prior studies, both internal and external to business writings, have explored the relationship between the top manager and organizational success, yet fail to find consistent explanations because of a multiplicity of subjective factors that are resistant to quantification. Most of the studies are reflective or descriptive in nature, with very little predictive power. Labor economics uses market forces to focus on the links between the quantitative aspects of pay and productivity (Heyman, 2005). Although the market for executive talent may not be perfectly efficient, in a free market system it is reasonable to assume that better managers and leaders will have greater compensation than their less qualified counterparts (Hambrick and D'Aveni, 1992; Kaplan, 2008). It is the goal of this paper to move beyond performance and pay for top management in business and find the link in performance and pay for top management in college sports in the form of the head football coach.

Division I college football coaches have found a marked increase in base salary in recent years as TV contracts and media exposure have led to an exponential rise in

college football popularity. The increased exposure has augmented revenue streams for athletic departments. As a result, successful coaches have also increased their pay. However, greater pay also leads to greater expectations. Failure to live up to expectations leads to large turnover rates in coaches with an average tenure of 4.5 years (Berkowitz & Upton, 2012).

Head football coaches have a distinct advantage over their business counterparts: Their "workers" are all short-term and equally "paid" based upon NCAA regulations. Each worker is recruited based upon talent and team need and may typically play four years. As opposed to having to pay workers different salaries for different positions, coaches are able to provide scholarships of equal value to all those who receive and use the offer. These conditions perhaps make the coach, the quality of "workers" the coach recruits, and the ability of the coach to make his players/team productive the most relevant factors for success. Just as a company competes against others to gain or maintain market share, so to do college football teams compete through persistent winning seasons. Moreover, if firms compensate top management for past performance then school boards and athletic departments analogously do the same for head football coaches by increasing their compensation from past success on the field.

With the increase in college football popularity, coaches have been commanding greater pay (Berkowitz & Upton 2012). Yet, at the same time school budgets have been shrinking. Coaches' base salaries (school pay) and athletic department budgets have come partly from university general funds that have left some to suggest that athletic programs become self-sustaining entities apart from the university (Sperber, 2001; Hinkle, 2011). The NCAA reports that only 12% of athletic programs have recently been profitable (Fulks, 2011) with two programs, football and men's basketball, among those driving profitability. Table 1 summarizes football revenues, salaries, and two performance measures for the top 10% and bottom 10% of football programs and coaches from 2006-2012.

Football revenues for the top 10% of programs were 20 times greater than those programs found in the bottom 10% in 2006 and 10 times greater in 2012. Salaries of the top 10% of coaches are about 5.9–7.8 times greater than those of coaches found in the bottom 10%. Interestingly, football revenue in the bottom 10% has closed the gap to the top 10% from 2006-2012, while the top 10% of coaches have widened the gap. The increased disparity is likely to have arisen due to the performance of the top 10% of coaches. Two performance measures are listed in Table 1: the number of wins in the current year and the number of final AP Top 25 rankings. The top 10% of coaches, as a whole, yield more wins and more AP Top 25 placements than the bottom 10% of coaches. Post-season appearances and success may also affect the salary disparity among coaches. Among the bottom 10% of coaches, representation in bowl games and conference and national championships is minimal, only four total post-season appearances in non-Bowl Championship Series bowls from 2006-2012. By comparison, the top 10% of coaches achieved 87 appearances in post-season play during the same time, with representation in all modes of games. Lastly, as football programs become more profitable, in large part due to TV contracts and revenue sharing agreements, college football coaches can continue to increase their school based salaries given an increased level of productivity by their workers (players) and growth in their programs.

Table 1. Revenues, Salaries, and Performance of Football Programs (2006-2012)

	Top 10%				Bottom 10%			
Year	Revenue	Salary	Wins	AP top 25	Revenue	Salary	Wins	AP top 25
2006	$34,600,000	$950,432	84	8	$1,644,105	$148,929	36	0
2007	$43,800,000	$969,500	98	8	$2,795,955	$163,947	44	0
2009	$54,600,000	$1,221,274	97	6	$4,483,775	$195,382	57	0
2010	$58,300,000	$2,655,000	92	6	$5,048,031	$340,644	50	0
2011	$60,200,000	$2,807,980	90	5	$5,359,382	$360,900	49	0
2012	$59,300,000	$3,429,341	99	6	$5,882,143	$376,088	55	0

Note: Football revenue data come from the U.S. Department of Education Equity in Athletics database. Salary data come from the *USA Today* coaches' salary database. No salary data exists for 2008 in the *USA Today* coaches' salary database. Wins and AP top 25 rankings come from www.sports-reference.com.

College football coaches are top managers in their respective athletic departments, and each has the goal that his workers will be productive, i.e., individual players combine their talent and accomplishments on the field to produce a win. Furthermore, the more productive each team is on the field, the greater the benefits and salary are to the coach. When finding the link between performance and pay, it is important to begin with the performance of a head coach. Hadley, Poitras, Ruggiero, and Knowles (2000) provide evidence in a study on NFL coaching efficiency. Coaching efficiency is measured as experience, and more efficient (experienced) head coaches can help teams win 3 to 4 additional games. This is a critical result, as collegiate coaching contracts often have performance-based incentives. Kahn (1993) found a similar result in Major League Baseball, with one conclusion being players taking a lower starting salary to play for a better manager. Bridgewater, Kahn, and Goodall (2009) also confirm that management efficiency leads to more productivity using British Football data. Berri, Leeds, Leeds, and Mondello (2009) find contradictory evidence to Hadley et al. (2000), Kahn (1993), and Bridgewater et al. (2009) when examining the NBA. Using data from 1977-2007 on NBA players and coaches, they conclude that most head coaches do not have as much impact as the players they coach. They may simply be just beneficiaries of good players. This result may simply be the differences in sports.

Another aspect of top management level pay relies on firm size. It is widely recognized, both in the academic research as well as in practice, that firm size is the most important determinant of executive compensation. The positive relationship between firm size and executive compensation has several explications rooted mainly in economic theory. This relationship is also well documented in the empirical literature (Cordeiro & Viliyath, 2003; Tosi, Werner, Katz, & Gomez-Mejia, 2000; Wright, Kroll, & Elenkov, 2002). For instance, in a meta-analysis of the empirical literature, Tosi et al (2000) conclude that firm size explains 40% of the variation of total compensation, while performance accounted for only 5% of the variance.

Zhou (2000) analyzes examines the executive compensation of 755 Canadian firms from 1991 to 1995 and finds that compensation rises with performance and firm size, with the exception of utility companies. O'Reilly and Main (2005) use data supplied in 2003 by executive compensation consultants in two different industries, retail and semiconductor manufacturing. They found that size accounts for 22% of the variance in CEO pay, while performance, assessed as the average return to shareholders over the previous three years, accounts for only 2%.

Most of the literature on college football has focused on players, racial discrimination (e.g., Mixon & Trevino, 2004), and the regulatory body of the NCAA (e.g., Kahn, 2007). Up to this point, there has been sparse research, to the authors' knowledge, on the compensation of a college head football coach. Humphrey's (2011) doctoral work on college football coach compensation from 2003-2009 concluded that institution size and tenure of the coach were the primary determinants in maximum compensation. Another study of college head coach compensation examines the link between collegiate level performance and pay in basketball. Humphreys (2000) examined the earnings gap in women's college basketball coaches in the 1990-1991 season. Humphreys concludes the disparity that existed among women's college basketball coaches is attributed to the job and is not gender based. That is to say women's college basketball coaches are compensated less than the men's college basketball coaches, regardless of the gender of the coach.

Data and Empirical Strategy

Data used in this study come from the *USA Today* college football coach salary database (USA), www.sports-reference.com, the U.S. Department of Education's Equity in Athletics database, and the NCAA.org. These data match 100 football bowl subdivision (FBS) colleges and universities, 185 head football coaches,[1] past success indicators of these coaches, and school characteristics from 2006-2012.[2] This provides a total of 603 observations across six years. Among the coaches in our dataset, 56 represent Bowl Championship Series (BCS) automatic qualifying (AQ) schools and 46 represent non-BCS schools (non-AQ).

USA Today reports three salaries for coaches: school pay, other pay, and total pay. Coaches also have bonus incentives tied directly to performance. We select school pay only to model the firm and top management relationship. Total salary includes pay not related to school-reported pay. School pay includes a base salary and other provisions the school obtains for the coach such as media and personal appearances, and ticket revenue reciprocity agreements, to name a few.

The average salary of an FBS college football coach from 2006-2012 was $1 million. On a yearly basis, head coach school salary was $446,000 in 2006 and $1.66 million in 2012. The greatest change in average school pay occurred in 2010 when it was $1.37 million, up from $558,000 a year before. The large change in average school salaries may have occurred from a change in reporting practices of schools or a change in the derived source of school pay.

Average school pay varies greatly when examining AQ and non-AQ coaches. From 2006-2012, the average school pay of an AQ coach was $1.4 million compared to their non-AQ counterpart, who averaged $470,000. Further, on a yearly basis, AQ coaches averaged $573,000 in 2006 and $2.4 million in 2012, a 318% increase in school pay.

Their non-AQ counterparts averaged $286,000 in 2006 and $650,000 in 2012, for a 127% increase in school pay. These remarkable growth rates in salary may be reflected by the marked increase in college football popularity coupled with TV contracts and other revenue sharing agreements, i.e., as revenues increase for schools, part of the influx is channeled to the head coach.

Head coach salaries may be directly linked to the size of the athletic department. The top management and pay literature has found a direct link between firm size and top management salaries. We investigate this link by using football revenue as a proxy for firm size. Football programs typically generate the most revenue for the athletic department, providing a direct correlation between football revenue and the athletic department's (firm) size. Among the schools in our sample, average football revenue totaled $20.9 million, with a minimum of $670,000 and a maximum of $104 million. AQ schools had average football revenues of $32.4 million with non-AQ schools averaging $6.34 million.

To model head coach compensation we rely on equation 1, using a fixed effects regression. The model consists of standard regressors found in the wage determination literature and is similar to Humphreys (2000), along with several regressors that are college football head coach specific,

$$P_{i,t} = \alpha_i + \beta X_{i,t-1} + \gamma Z_{j,t-1} + \varepsilon_{ij} \quad (1)$$

where $P_{i,t}$ is the school pay head coach i received in time t. $X_{i,t-1}$ is a vector of success measures specific to coach i in the prior year. The variables in this vector include winning percentage from the previous year, a dummy variable equal to one if the coach led the team to a top 25 AP ranking, a dummy variable equal to one if the coach led the team to a bowl game, a dummy variable equal to one if the school is in an AQ conference, and an interaction term between AQ and the coaches record. $\mathbf{Z}_{j,t-1}$ is football revenue generated for school j in the prior year that serves as a control for institutional size, and ε_{ij} is the composite error term. The natural logarithm is taken for variables that are not dichotomous or expressed in percentage terms. Taking the natural log of total compensation also helps to scale the data and control for heteroskedasticity.

We model prior year success in equation (1) to determine if coaching success in one season has any impact on the ability to earn a higher salary. Schools may be reluctant to make such changes on a one-time basis, but often a big bowl win or conference championship win facilitates these changes. As an example, Gene Chizik was the head coach for Auburn in 2009 with a school salary of $500,000. After winning the SEC conference championship and BCS national championship his school salary increased to $2.1 million in 2010.

Coaches are not hired and paid solely on their previous year's record; we modify equation (1) to include cumulative success.

$$P_{i,t} = \alpha_i + \phi X_{i,t-n} + \gamma Z_{j,t-1} + \varepsilon_{ij} \quad (2)$$

The variables included in equation (2) are modified to measure success as an ongoing process to the year of current employment. $X_{i,t-n}$ now represents the number of years a coach was a head coach at the college level, their career winning percentage,

their total number of bowl appearances, their total number of conference championship appearances and wins, and their total number of national championship appearances. Using cumulative success may help explain why some coaching salaries are greater than others.

Results

Table 2 presents the summary statistics for the 185 coaches and 100 schools in our sample and Table 3 presents the results of the empirical models. To ensure correct statistical inference and that the standard errors are robust, we tested for heteroskedasticity and autocorrelation. Test results revealed our data exhibited both, thus we use cluster robust standard errors for valid inference. Tests for fixed versus random effects were conducted using an augmented Hausman test (see Wooldridge 2002) that allows for non-constant variances. Results indicated that fixed effects were statistically preferred to random effects.

Table 2. Summary Statistics for 185 Head Coaches and 100 Colleges

Variable	Definition (source)	Mean	Std. dev.
lnSCPay	Natural log of school pay (*USA Today*)	13.7478	0.8588
lnFootballRev	Natural log of previous year football revenue (US Dept. of Education Equity in Athletics database)	16.4172	0.9929
Record	Previous year winning percentage (sports-reference.com)	0.5177	0.2187
APRank	Dummy if team was in AP top 25 (sports-reference.com)	0.2172	0.4127
BowlPart	Dummy if team participated in bowl game in previous year (sports-reference.com)	0.5373	0.4990
AQ	Dummy if team is an AQ school (sports-reference.com)	0.5572	0.4971
AQRecord	Interaction of AQ and Record	0.3196	0.3224
Exp	Total number of years as head coach at any college level (NCAA)	8.8027	8.0058
CoachRecord	Cumulative winning percentage (NCAA)	0.5042	0.2271
BowlApp	Total number of bowl appearances (NCAA)	4.1857	5.1181
CumConfApp	Total number of conference championship appearances (NCAA)	1.2919	1.8997
CumConfW	Total number of conference championship wins (NCAA)	1.0547	1.6830
CumNCApp	Total number of national championship appearances (NCAA)	0.2139	0.7531

Table 3. School Pay and Success Model Results.

	Prior year success	Cumulative success	All success
lnFootballRev	0.6926***	0.1579**	0.1614*
	(0.0913)	(0.0796)	(0.0846)
Record	0.0356	-	0.1778
	(0.2454)	-	(0.2095)
APRank	-0.0535	-	0.0395
	(0.0595)	-	(0.1280)
BowlPart	-0.0054	-	-0.0725
	(0.0990)	-	(0.0797)
AQ	0.3501***	0.7104***	0.7539***
	(0.3624)	(0.1798)	(0.2819)
AQRecord	0.3015	-	-0.0859
	(0.4130)	-	(0.3260)
Exp	-	0.1250***	0.1225***
	-	(0.0325)	(0.0347)
CoachRecord	-	0.1807	0.1651
	-	(0.1697)	(0.1693)
BowlApp	-	0.1696***	0.1781***
	-	(0.0471)	(0.0516)
CumConfApp	-	-0.0276	-0.0398
	-	(0.0521)	(0.0537)
CumNCApp	-	0.1235	0.1278
	-	(0.1323)	(0.1332)
constant	1.7078	8.4923***	8.3859***
	(1.3868)	(1.1599)	(1.2163)
R^2	0.3116	0.6011	0.6025
N	603	603	603
F	44.1	60.7	41.0

Notes: * p<0.10, ** p<0.05, *** p<0.01. Cluster robust standard errors in parentheses. Individual fixed effects are used.

Across each of the three models, several variables are highly significant and each displays the presumed sign. Revenue generated from football is highly significant in determining coach school pay in each model. This is not surprising as we expect when a program generates more revenue they can increase the compensation of the head coach. This provides further evidence, outside of the business world, in support of the firm size and top management pay theory. With an estimated value of 0.6926, a 1% increase in the revenues generated by the football program will increase coach's pay 0.69%. For the average school, this represents an increase in football revenues by

$210,000 leading to an increase in average school salary of $6,500. For the average school, this is equivalent to selling one-tenth of the maximum number of seats in one game with a ticket price of $46.[3] Moreover, it is likely that a coach who makes the team more productive (wins) raises the desire for fans to attend games and enhances revenue. This in turn may lead to greater future school pay for coaches who have incentive clauses based upon attendance and ticket sales.

AQ measures the wage premium among head coaches. In each model, AQ is positive and statistically significant for coaches belonging to an AQ conference. When considering all success measures, there is a 112% wage premium, or a coach earns approximately $500,000 more for just being in an AQ conference. This is likely the result of AQ conferences having significantly more revenue to spend on new coaches or to retain coaches who have been successful in previous seasons. AQ conferences receive the lion's share of college football's revenues. In 2010, the SEC—an AQ conference—distributed $18.3 million in revenue per member school compared to $2.8 million by C-USA—a large non-AQ conference.

Exp measures the cumulative number of years a head coach has coached at the collegiate level in any division. It is positive and significant in the *cumulative success* and *all success* models. This result indicates a coach can increase his pay by increasing his tenure at the collegiate level. *BowlApp* measures the cumulative number of bowl appearances for a coach. *BowlApp* is positive and significant, which is not surprising because it indicates appearing in bowl games increases a coach salary. This especially rings true for non-AQ schools, because their likelihood of achieving greater success in the post season has largely been crowded out by the AQ schools.

To examine the effects of regional and national success we incorporate two success variables into our last two models. These past success measures represent the performance capabilities that a coach brings to the team, and greater success should lead to greater pay. Each measure accounts for appearances and not wins as wins are nested in appearances. We include the variable *CumNCApp* that measures whether a head coach had previously appeared in a national championship game. While the result is positive, it is insignificant. *CumConfApp* measures the number of appearances a coach has had in a conference championship game. Again, the result is positive yet insignificant. These results run contrary to our prior assumptions, as we expected higher levels of success to contribute to school pay. One possible explanation is that higher levels of success are compensated via bonuses. Select coaches may be able to renegotiate contracts after a conference or national championship appearance, but it is not standard. Another explanation for the insignificance of three success variables is the "What have you done for me lately?" mentality. Past success does not necessarily guarantee increased pay. This result is surprising; it may be a consequence of the methods of compensation of football coaches. Many of the coaches in our sample have incentive-loaded contracts in which the majority of compensation is not reported as salary.

Lastly, we separated the models (Table 4) into two groups AQ schools and non-AQ schools and ran regressions for each. We did this to gauge the effects of firm size on coach salary. Non-AQ schools averaged $6.34 million in football revenue whereas AQ schools averaged $32.4 million in football revenue, a 400% increase. For the variable *lnFootballRev,* the separate regressions provided estimates between 0.20 - 0.47 for non-AQ schools at the 1% significance level and 1.15 for AQ schools at the 1% significance

Table 4. School Salary and Success Model Results by Status of School

	AQ			Non-AQ		
	Prior Year Success	Cumulative Success	All Success	Prior Year Success	Cumulative Success	All Success
lnFootballRev	1.1528***	0.0052	-0.0112	0.4712***	0.2088***	0.2070***
	(0.2014)	(0.1405)	(0.1499)	(0.1003)	(0.0887)	(0.0918)
Record	0.4177	-	0.3933	-0.0945	-	-0.0334
	(0.6172)	-	(0.4367)	(0.2441)	-	(0.2044)
APRank	-0.1189	-	-0.0171	0.4926**	-	0.1749
	(0.2041)	-	(0.1426)	(0.2005)	-	(0.1509)
BowlPart	-0.0873	-	-0.0922	0.0741	-	0.0022
	(0.1575)	-	(0.1364)	(0.0875)	-	(0.0743)
Exp	-	0.2550***	0.2580***	-	0.0493**	0.0523*
	-	(0.0535)	(0.0620)	-	(0.0081)	(0.0267)
CoachRecord	-	0.3875	0.3356	-	0.1248	0.1092
	-	(0.0683)	(0.3046)	-	(0.1391)	(0.1424)
BowlApp	-	0.0683	0.0706	-	0.1046*	0.0963
	-	(0.0753)	(0.0860)	-	(0.0555)	(0.0582)
CumConfApp	-	0.0330	0.0205	-	0.0574	0.0530
	-	(0.0801)	(0.0859)	-	(0.0728)	(0.0717)
CumNCApp	-	0.0566	0.0561	-	-	-
	-	(0.1064)	(0.1084)	-	-	-
constant	-6.0959*	10.4856***	10.6173***	5.5105***	8.8907***	8.9284***
	(3.4448)	(2.2772)	(2.4117)	(1.5635)	(1.3055)	(1.3543)
R^2	0.1635	0.3204	0.331	0.3085	0.4989	0.5028
N	336	336	336	267	267	267
F	9.6	38.8	26.8	8.8	14.5	9.5

Notes: * p<0.10, ** p<0.05, *** p<0.01. Cluster robust standard errors in parentheses. Individual fixed effects are used. The variable CumNCApp was dropped in the non-AQ models as none of the coaches had made any appearances in the national championship.

level. For every 1% increase in football revenue, coaches at non-AQ schools can expect, on average, a 0.47% increase in salary from the prior year whereas coaches at AQ schools can expect, on average, a 1.15% increase in salary from the prior year. Firm size (athletic department size with football revenue serving as a proxy) has a strong positive impact on the head coach's salary. The results show that football revenue is insignificant in two models, and even negative in one model, for AQ schools. We again assert the "What have you done for me lately?" mentality here. Performance as meas-

ured in cumulative success and all success account for longer periods of success and failure. Coaches who have not performed to certain school standards have not received the increase in salary as a result of increases in football revenues.

Other notable results from Table 4 include *Exp* being positive and significant across the four models using it with experience being more important in terms of magnitude and statistical significance for AQ schools. Specifically, increasing experience by one year increases school salary by approximately 29%. Turning to the non-AQ models, if a coach can place his team in the AP top 25 final rankings, school salary can be expected to increase by 63%. This is an important result for non-AQ schools, as the vast majority of these schools are found outside of the AP top 25 final rankings. A non-AQ coach thus signals that his team is of sufficient quality and should be rewarded for the performance of the team. The same can be said for *BowlApp*, which is the cumulative number of bowl appearances. As most non-AQ schools are left out of the BCS games, going to a bowl serves as a final success indicator. Non-AQ coaches can expect an 11% increase in salary for increasing their cumulative bowl appearances by one appearance.

Conclusion

We have found a strong statistical link between the revenue a football program receives and current compensation. Moreover, the more revenue a school receives from its football program the higher the compensation of the coach. This relationship is present in our models of prior year success, cumulative success, and all success. However, when we separate the AQ status of colleges, our models indicate that head coaches at AQ schools can only rely on prior year football program revenues to increase their current year pay. For coaches at non-AQ schools, football program revenue is important in all aspects of the coaching career and current compensation. This may be explained as head coaches at AQ colleges having arrived at the top of their field and only the amount of football-generated revenue matters. This relationship is also present in the experience of a college football coach. That is, increasing the number of years as a head coach increases school pay. We also found evidence that major football conferences (i.e., AQ conferences) tend to pay more than their non-AQ counterparts, invoking a wage premium. However, this may be linked to revenues AQ conferences receive in the form of higher payouts in bowl game revenues and television contracts.

With many programs obtaining six, seven, and eight win seasons, evidenced by the number of programs that go to bowl games, athletic departments and school boards may want coaches raising visibility of a program by producing more wins. This result is in line with established literature on management pay; however, the diluted pool of successful seasons—70 bowl bids are available— may have a significant effect on our results. Head football coaches at American universities are indeed compensated in a similar fashion to corporate top management with past performance motivating future compensation; moreover, as with management, pay of a head coach does not guarantee future success. It is apparent from our results that the strongest link between head coaches and top management is the size of the athletic department/firm. For head coaches seeking the most lucrative contracts, prior bowl appearances and experience are only the first steps toward greater pay. These accomplishments accompanied with a move to a larger program are a way to establish a greater level of pay, much the same as with top management in the business world.

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Endnotes

[1] Of the 120 available Division I schools, only 102 reported compensation information. The 18 non-reporting schools are either private institutions or public institutions exempted from releasing information under state law.

[2] All years are included except 2008 where no data was reported for head coach salaries.

[3] Calculation based on average attendance of 44,863 of all schools in 2010.

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