ACADEMY AWARD SIGNALING AND GENDER BIAS IN HOLLYWOOD

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ABSTRACT: *In this paper, I attempt to look at the salary signaling benefits of winning an Academy Award for acting. Specifically, I look at whether this signal is different for male winners for Lead Actor and female winners for Lead Actress in attempt to make a broader conclusion on the gender bias at play in Hollywood. My results prove that while men receive a markedly large increase in their salary following winning this distinguished award, women do not receive a significant benefit for winning their corresponding honor. Whether this difference in rewards is due to the fact that an Academy Award win for Lead Actress is not considered as valuable as the Lead Actor category or due to some inequality within the industry as a whole is perhaps unanswered. In either case, gender bias in the pay schemes of Hollywood actors and actresses is displayed through the Academy Award signal.*

JEL: L82, J16, J71

I. INTRODUCTION

Since before women earned the right to vote in America, there has always been a market for both men and women to work as actors in the film industry. To the public, both men and women have always been regarded as movie stars. From Mary Pickford and Charlie Chaplin to Julia Roberts and Tom Cruise, there is a rich history of movie stars that has seemingly always been gender neutral. However, perhaps since the public also knows how amazingly well movie stars are paid for their talent, questions of gender discrimination in pay are often not a point of discussion. Certainly both male and female actors are paid handsomely for their abilities to reel in audiences and generate profit for studios, but are men and women rewarded differently?

In recent years, Forbes Magazine has listed the top paid actors and actresses of the year. In 2006, half of the top 20 highest paid actors, according to Forbes, were women. However, these actresses were listed at spots 11 through 20. Only two women cracked the top ten on the Forbes list in 2008. They were listed at spots five and nine. In the recent 2009 list, only one woman made the top ten at the number ten spot. Evidently from these lists, there seems to be some difference in how these highest paid actors and actresses are paid. This year alone, the highest paid actor, Harrison Ford, made $65 million. The highest paid actress, Angelina Jolie, made almost a third of that figure with $27 million.

There is certainly some question as to whether or not the discrepancy in these salary figures is based upon gender discrimination. It is arguable that the best indicator for how an actor or actress should be paid is how successful they are at attracting audiences and generating box office revenue. Like most occupations, the demand for

such actors would be predicated upon their ability to make their employees money and they would be rewarded accordingly. In keeping with this same idea, there also seems to be a huge discrepancy between how male and female actors fair at the box office. Utilizing an average box office gross figure that is calculated by adding together the gross box office revenue of each of an actor's starring films in their career and dividing that summation by the number of films, ten actors have average figures over $100 million while only 2 actresses have reached that milestone. Certainly if actors and actresses are paid based upon their box office power, the idea that male actors in general or a certain group of male actors are better at selling movie tickets might explain the salary discrepancy. However, it is also possible that this figure reflects the types of roles that are offered to men more so than women.

In order to truly uncover gender discriminatory pay practices there is certainly a need to compare how men and women are paid for performing the same exact job. In the case of the acting profession, perhaps male actors and actresses are simply not working in exactly the same industry. Since men and women are never playing the exact same characters in the exact same films, disparities in pay may be due to the variation in these roles. In cinema, there are different genres by which different actors and actresses are usually relegated to being defined within. Action stars are very often paid a great deal more than comedy stars or melodramatic stars. If then, women as a whole are more narrowly piled into certain genres over others, this could also be a possible explanation for salary discrepancy between men and women. In my opinion, it has been clearly visible throughout the history of Hollywood (and film around the world) that more men are considered "big action stars" than women. Men like John Wayne, Sean Connery,

Arnold Schwarzenegger and Tom Cruise reap the salary benefits of being generational icons by starring in big budget, high grossing action films. While there are certainly some examples of female action stars like Sigourney Weaver, Linda Hamilton and Angelina Jolie, arguably such women have not been able to reach the same iconic statuses throughout their careers (except perhaps very recently). Whether or not this in it of itself is part of gender bias in Hollywood is debatable. Nevertheless, an actor or actress who is constantly starring in big budget action movies may not exactly be performing the same job as an actor starring in low budget comedies or dramas.

The aim of this study is to attempt to discover whether or not the difference in compensations between actors and actresses is due to gender discrimination. In order to do so, box office revenue and film budgets are certainly things that need to be controlled for. As well, actors and actresses need to be compared across the same standard. That is, in the case that actors and actresses are simply performing in two different spheres of the same industry, some measure needs to be taken to bridge this gap. In order to do so, I argue that the best measure would be to study those stars that are rewarded for being the best at their jobs as actors rather than box-office generators and icons. The signal that this reward sends to film producers and distributors can then be compared in order to display whether gender bias reflects on salaries. Certainly if both men and women are rewarded for being the best at what they do, then there is no reason why earning such a reward should send a different signal for actors than for actresses.

Since 1929, The American Academy of Motion Pictures and Sciences (AMPAS) has been recognizing the best in Hollywood filmmaking. The Academy Award or Oscar for acting is inarguably the greatest award an actor can receive in their career. Since its

beginnings, the Academy has awarded a Best Lead Actor and Best Lead Actress Oscar every year. As well, since 1936, Oscars have been given away for actors and actresses in supporting roles. Thus, both male and female actors have always been rewarded in the exact same way by the AMPAS. Being rewarded the Academy Award sends a signal to the public, to filmmakers and especially to film producers that that actor is one of the best at what they do. Therefore, these actors should be rewarded for their ability to make a film better with their performance and for their ability to draw crowds of theatergoers through their prowess. Such acknowledgement also enhance these actors' marketing of themselves as deserving of larger salaries thanks to film producers' demand for high caliber actors and actresses to make profitable movies. In my opinion, a difference in the salary signal of winning an Academy Award for men and women would say one of two things. Either this difference displays a relative lack of importance placed upon winning the Academy Award for Lead Actress as opposed to the Lead Actor category or a greater demand inherent in the film industry for male stars to carry a movie over their female counterparts. While the latter of these explanations displays a gender bias on a larger scale, both reasons point to sexism in Hollywood.

II. LITERATURE REVIEW

Literature on the economics of film is somewhat scarce. This is especially true in the case of labor. It does not appear as though there has been much empirical work done on labor issues in any film economics papers. However, there are two useful theoretical film economics paper discussing contractual issues, Darlene C. Chisholm's "Asset Specificity and Long-Term Contracts: The Case of the Motion Picture Industry" and

Mark Weinstein's "Profit-Sharing Contracts in Hollywood: Evolution and Analysis", that have helped to inform how my dataset dealt with actors/actresses receiving percentages of the film's total gross or revenue. Chisholm's paper went into detail discussing the different ways in which actors can be compensated for a film. Weinstein's "Profit-Sharing Contracts in Hollywood: Evolution and Analysis" takes a similar look at profit-sharing schemes that actors/actresses receive. Weinstein, in particular, displayed how film distributors, through different accounting techniques, are actually able to claim that high grossing movies were in fact not profitable. These practices are often implemented, and, therefore, it is very difficult to discover how much an actor actually received when they have a profit-sharing contract. The net revenue is not as simple as subtracting the budget from the total worldwide revenue.

Since literature of film labor is scarce, I turned toward CEO compensation studies. These proved to be more prevalent and rather comparable. As CEO's are compensated extremely large individual salaries, they can be compared to actors and actresses easily. In fact, Sherwin Rosen's superstar theory, from his 1981 paper, "The Economics of Superstars," is extended both to CEO compensation paper as well as a great deal of film economics literature. This paper in many ways was in the inspiration for this study. The theory discusses why certain individuals in certain industries receive such astronomically high salaries. Two important papers on CEO compensation that proved useful for my project were Kevin Murphy's 1998 paper entitled "Executive Compensation" and Morten Bennedsen, Francisco Pérez-González, and Daniel Wolfenzon's paper "Do CEO's Matter?" The former paper is a literature review of CEO compensation papers and provides a large theoretical basis for a great deal of future CEO

research. Specifically important to my research is Murphy's discussion of the link between CEO pay and performance. Murphy concludes that higher incentives (greater salaries) for CEO's do not lead to better company performance. This is an extremely useful idea for my research in discussion of profit and revenue sharing salaries. That is, if extended to actors, a greater incentive to perform better does not affect the results of the performance. Therefore, an actor receiving a percentage of revenue will not be sure to act better in order to secure a higher salary. In this case, total compensation from these figures may be able to be regarded as the same as base salaries.

The paper by Bennedsen et al. is a very close mirror to my research plan. Bennedsen and his colleagues try to determine how essential CEO's are to their company's performance by looking at performance after a mid-career shock in a CEO's life. The shocks looked at were either the CEO's own death or the death of an immediate family member. Bennedsen et al. found that in these cases the return on assets for the firms experienced a statistically significant decline following one of these shocks. Bennedsen et al. conclude from this data that CEO's have a crucial role on the performance of their firm and that the private spheres of their lives are deeply connected to their business spheres. Unlike the seminal work by Michael Spence in "Job Market Signaling" in which Spence discusses the link between education and the signal it sends to employers for higher salaries, Bennedsen et al. look at mid-career signals and their affect on performance. My research, in many ways, is a blend of Spence and Bennedsen's ideas as I will be looking at shocks that occur in the middle of an actor's career and the affect that these shocks or signals have on salary. The Bennedsen et al.

paper is also essential if extended to actors in making the claim that actors and actress's performances are essential to a film's success.

Finally, a third CEO compensation paper that proved to be extremely similar to my study is Malmendier and Tate's paper entitled "Superstar CEO's". This paper attempts to measure the effect of CEO's winning substantial awards. The main focus of the paper was on how performance was affected by these awards. However, Malmendier and Tate also look on the changes in salary following awards. They find that performance of the CEO's firm decreases while the salary of the CEO increases. Malmendier and Tate utilize a control group of "predicted winners" in order to measure the effect of awards and superstardom. The authors match CEO's who did win the award with CEO's who did not but were very similar. Therefore, they are able to isolate exactly how winning the award affects the winners by comparing them to this control group. In the case of my study, a possible control group of "predicted winners" from the pool of nominees would be extremely difficult given the small pool of other nominees and the very large differences among actors. However, this is a possible avenue for future research.

III. DATA & MODEL

Unlike CEO's, actors and actresses are not required to publicly announce their salaries. For this reason, salary data on actors/actresses is somewhat rare. Therefore, the data does not focus purely on recent Academy Award winners. The set is a completely comprehensive list of Academy Award winners for Lead Actor and Actress in which a salary figure was reported in at least one film prior to an Oscar win and at least one film

following the win. This list extends from Gary Cooper's win for Best Actor in 1942 for *Seargent York* and Ingrid Bergman's Best Actress win in 1945 for *Gaslight* to Denzel Washington's 2002 win for *Training Day* and Reese Witherspoon's 2006 win for *Walk the Line*. The data set includes 20 actors with 233 salary measurements and 14 actresses with 128 measurements. Salary figures are hand-collected from the Internet Movie Database. The list includes actors and actresses who have had multiple wins in this category (i.e. Tom Hanks and Elizabeth Taylor). In the case of these actors, the effect of the first Oscar win for Lead Actor or Actress is being measured. The list also includes actors and actresses who have previously won Supporting Actor Oscars (i.e. Meryl Streep and Kevin Spacey). Wins in these categories are not counted toward the affect of a Lead Oscar win, but these actors and actresses are still included in the dataset. A table of all actors and actresses in the sample is displayed in the appendix.

Many other variables are included to control for the salary an actor receives in order to isolate the affect of the Oscar. These include five "actor specific" variables as well as one "movie specific" variable. The most important variable in this analysis is dummy variable for a Lead Acting Oscar win. This variable reads one for films released following the actors' first win as a lead. There is a lag in this variable that is corrected for as salaries are often decided in advance of the films shooting and release. Unfortunately, it is not reported exactly when the actor signed a salary contract for each specific figure. Therefore, I make a general assumption about the length of this lag that is extended for each and every film. The Academy Awards Ceremony, where the winners are announced, takes place in March and is held for films in the previous year. For example, Al Pacino received his Academy Award for *Scent of a Woman* in March of

1993, yet this film was released in 1992. Therefore, he is considered the 1992 Best Actor Winner. To adjust for the lag in salary, films released in the year following the win were given a value of one in the Oscar variable (i.e. movies released in 1994 in Al Pacino's case).

The actor specific box office variable (Box Office) measures the actor's total career box office gross prior to each given film. In the case of the more recent winners, this data was all collected from BoxOfficeMojo.com. This website features a very comprehensive list for each actor and eliminates films that the actor was not prominently featured in. In the case of the older winners, box office data was collected from The-Numbers.com. However, since box office data was either not reported for every film in earlier years or because these figures have been lost over time, there are many films in which salary data is reported but box office figures are not. The Box Office variable only includes domestic box office.

The dataset also includes a dummy variable for whether or not the actor also received a percentage of the gross or profits of the film (Points). As it is very difficult to determine exactly what the total compensation of the actor was after receiving one of these percentages (especially given Hollywood Accounting practices), the dummy variable is utilized to simply control for whether or not the actor/actress is receiving percentages.[1] In the case of three data points (Jack Nicholson for *Batman* and Tom Hanks for *Saving Private Ryan* and *Forrest Gump*), the listed salary is a total compensation after factoring in percentages of the gross/profit received. These observations are eliminated as the base salary cannot be stripped from the total

[1] Mark Weinstein, "Profit-Sharing Contracts in Hollywood: Evolution and Analysis," *Journal of Legal Studies* 17, (1998): 68.

compensation. The details of whether or not an actor received points for a given film is listed alongside base salaries on the Internet Movie Database.

The fourth actor specific variable is an age variable which is defined as the age of actor/actress at the year of the film's release (Age). This variable also acts as an experience variable given that as the age of the actor increases, the number of films they complete generally increases.

The fifth and final actor specific variable is a decay variable (Decay). This variable measures the number of films completed by that actor since the Oscar win. For example, the Decay variable reads 14 for Tom Hanks' salary for *The Da Vinci Code* as this was Tom Hanks' fourteenth film completed since winning his first Academy Award for Best Actor in 1994 for *Philadelphia*.

Lastly, a variable was included for other awards won by an actor or actress. This variable includes Golden Globe and Emmy wins for acting. As well, the variable also includes previous Supporting Actor or Actress Oscar wins and second Lead Actor or Actress wins. Actor/Actress' year of birth and other awards won were also hand-collected from the Internet Movie Database.

The movie specific variable is a variable that controls for the budget of each individual film (Budget). Budget measurements were collected from the Internet Movie Database. However, like salary and box office figures, budgets were sometimes not reported. Along with salaries and box office figures, film budgets are adjusted for inflation using 1982 base prices.

IV. METHODOLOGIES

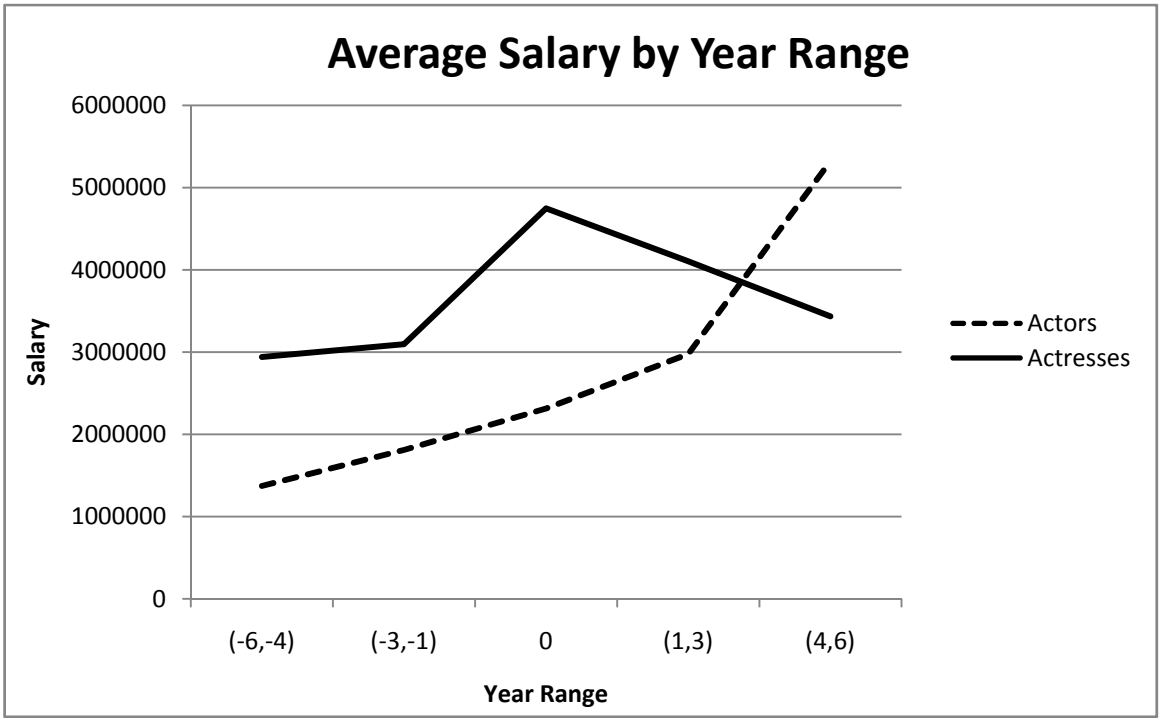
The summary statistics on $Salary_{ij}$ (= the amount of base salary that actor i earned by starring in movie j) are displayed on Table I. This table shows two crucial figuress. Based upon the means after winning an Oscar and before winning for men and women, men's salaries increase on average by about 213% and women's salaries increase by about 20% on average. Clearly in looking only at these statistics alone, it is easy to see that male actors benefit more from winning the Academy Award. Second, the mean salary for actresses in the sample is $3,032,309.66 while the mean salary for actors is $2,155,501.10. The higher average salary of women in the sample does not seem to fit with the general norm of salary discrimination or among the statistics of the highest paid actors outlined earlier. The same idea can also be seen in Figure I. Figure I displays the average salaries of men and women separately depending upon the year of release for each film's salary figure. While the figure certainly shows that actors' salaries increase significantly after winning, the actresses' salaries seem to decrease. The figure also displays that the female salaries are generally higher than the male salaries.

TABLE I
SALARY SUMMARY STATISTICS

Variable	All Actors	Male Salary	Female Salary
Full Career	$2,466,391.70	$2,155,501.10	$3,032,309.66
	[361]	[233]	[128]
After Oscar	$3,358,030.67	$3,379,858.76	$3,319,026.38
	[170]	[109]	[61]
Before Oscar	$1,672,786.28	$1,079,251.23	$2,771,269.06
	[191]	[124]	[67]
Difference	$1,685,244.39	$2,300,607.53	$547,757.32

Notes: Numbers in brackets represent the number of observations. Differences are taken by subtracting the before figures from the after figures.

FIGURE I



Notes: All figures are average salaries based on release years of the film. (-6,-4) represents salary figures of films released 4 to 6 years prior to winning an Academy Award. (-3,-1) represents 1 to 3 years prior to winning an Academy Award. 0 represents the year the Academy Award is received. (1,3) represents 1 to 3 years after winning an Academy Award. (4,6) represents 4 to 6 years after winning an Academy Award.

There are two possible reasons for the higher average salary among women in the sample. It could be due to the fact that Academy Award winning actresses represent a different sample of the entire pool of actresses whereby the idea that male actors are generally paid higher does not apply. More logically, however, this is due to selection bias on the part of salary reporting. Since the dataset was collected from the entire pool of Best Actors and Actress winners, there is no reason why there should be a significantly higher amount of salary figures for men in the sample. Selection bias would most likely inflate the salaries of women as perhaps only women who are making a significantly large amount of money are reported on IMDB.com. In order to correct for selection bias I

take the average salary of each male actor in the sample and eliminate the 6 lowest-paid actors. The new modified dataset is made up 14 men and 14 women. The summary statistics of the salaries for this dataset are displayed in Table II. After eliminating the 6 lowest paid actors, the average male salary is slightly higher than the average female salary, and the number of observations is almost equal. Also notice that after making the male sample more comparable to the female sample, the difference in salary for men before and after winning has increased to $3,896,257.16.

TABLE II
SALARY SUMMARY STATISTIC OF MODIFIED DATASET

Variable	All Actors	Male Salary	Female Salary
Full Career	$3,052,624.78	$3,070,937.01	$3,032,309.66
	[270]	[142]	[128]
After Oscar	$4,300,433.50	$5,266,011.47	$3,319,026.38
	[123]	[62]	[61]
Before Oscar	$2,008,539.94	$1,369,754.31	$2,771,269.06
	[147]	[80]	[67]
Difference	$2,291,893.56	$3,896,257.16	$547,757.32

Notes: Numbers in brackets represent the number of observations. Differences are taken by subtracting the before figures from the after figures.

The means of the independent variables in both the complete and modified dataset are displayed in Table III. As shown, roughly half of the salary measurements observed are taken before the Academy Award win and half after. About 87.5% of salary measurements observed are total salary measurements (no percentages of gross or profits received). The average age at the time of winning is about 43.150 in the case of men in the complete dataset and 43.214 in the case of the modified set. For actresses, the average age at the time of winning is about 31.143.

A two-way fixed effects model with actor/actresses fixed effects and movie fixed effects is not feasible given that there are very few movies that repeat for more than one

TABLE III
SUMMARY STATISTICS OF INDEPENDENT VARIABLES

Variable	Complete Dataset	Modified Dataset
Oscar	0.471	0.456
	(0.500)	(0.499)
	[361]	[270]
Points	0.125	0.126
	(0.331)	(0.332)
	[361]	[270]
Budget	24106854.38	25832378.51
	(20130965.37)	(20874447.75)
	[232]	[199]
Age	40.452	38.793
	(12.383)	(11.633)
	[361]	[270]
Decay	6.518	5.644
	(10.085)	(9.362)
	[361]	[270]
Other Awards	1.253	1.387
	(1.699)	(1.701)
	[360]	[269]
Box Office	328400338	379063894
	(271422026)	(278702689)
	[304]	[237]

Notes: Standard deviations are in parentheses. Number of observations are in brackets.

actor or actress in the dataset. Therefore, I only control for actor fixed effects. I define that dataset as longitudinal panel data to measure these fixed effects. I create an interaction term between the Oscar variable and an additional dummy variable (Female) indicating each actor's gender since there is not enough actors and actresses to run separate regressions. The significance of this variable will determine whether actresses receive a different salary signal than men for the same award. I also create an Age^2 variable as well as interaction terms between Female and both Age and Age^2 as these can also be telling indicators of gender bias. The Female variable is dropped in the regression as the actor fixed effects already controls for gender.

I regress the salary variable on the Oscar dummy variable, the Female Oscar interaction term, the Points dummy, Budget, Age, the Female Age interaction term, Age^2, the Female Age^2 interaction term, Decay and $Decay^2$, the Other Awards variable and finally the total Box Office variable. I test for high multicollinearity among the variables, and find the correlation between Box Office and Other Awards is 40.36%. I therefore run separate regressions: one without the Other Awards variable (with Box Office) and one without the Box Office variable (with Other Awards). I also use robust standard errors with clustering to check for heteroskedasticity.

I estimate the following one-way fixed effects model to evaluate the effect of the Oscar and other variables on salary:

$$Salary_{ij} = \beta_{ij}Oscar_{ij} + \gamma_{ij}Oscar_{ij}*Female_i + \sigma_{ij}Points_{ij} + \mu_j Budget_j + \alpha_{ij}Age_{ij} + \alpha_{ij}Age_{ij}*Female_i + \alpha_{ij}Age^2_{ij} + \alpha_{ij}Age^2_{ij}*Female_i + \rho_{ij}Decay_{ij} + \lambda_{ij}Decay^2_{ij} + \phi_{ij}OtherAwards_{ij} + actor/actress\ fixed\ effects + \varepsilon_{ij}$$

V. RESULTS

V. A. COMPLETE DATASET

I first run the one-way fixed effects regression on the complete dataset of 20 actors and 14 actresses. The results of this regression are presented in Table IV. Regression 1 contains the Other Awards independent variable but not the Box Office variable. I find that the Oscar variable as well as the Female Oscar interaction term are both statistically significant at the 5% level in Regression 1. While the coefficient on the Oscar variable is positive, the coefficient of the Female Oscar variable is negative. The

TABLE IV
REGRESSION RESULTS ON SALARIES OF COMPLETE DATASET

Variable	(1)	(2)
Oscar	1,805,489.00	1,540,107.00
	(2.46)**	(1.83)*
Female Oscar	-2,145,604.00	-1,720,171.00
	(2.32)**	(1.63)
Points	-943,232.80	-757,168.50
	(2.02)**	(1.45)
Budget	0.04	0.04
	(5.13)***	(4.78)***
Age	530,513.10	422,605.90
	(3.77)***	(1.94)**
Female Age	661,799.00	634,885.20
	(2.69)***	(2.21)**
Age^2	-5,568.65	-4,316.82
	(3.69)***	(2.10)**
Female Age^2	-7,915.05	-7,356.76
	(2.87)***	(2.32)**
Decay	-173,121.50	-137,041.60
	(2.28)**	(1.57)
$Decay^2$	5,373.99	4,434.41
	(2.77)***	(2.01)**
Other Awards	465,446.10	
	(2.38)**	
Box Office		0.003
		(2.12)**
Observations	231	204
Groups	33	32

Notes: Both regressions are one-way fixed effects regressions on salary. Regression (1) contains the Other Awards variable and not the Box Office variable. Regression (2) contains the Box Office variable and not the Other Awards variable. Absolute values of t-statistics are in parentheses. * Significant at 10% level. ** Significant at 5% level. *** Significant at 1% level.

results of Regression 1 display that for a man, winning an Oscar has a $1,805,489.00 increase on salary. For actresses, the effect of winning an Oscar is $2,145,604.00 lower than the effect for a male actor. This would then make the effect of winning an Oscar for a woman negative. However, the total effect of Oscar for actresses ($\beta_{ij} + \gamma_{ij}$) is not

statistically different from zero even at the 10 percent level, suggesting that winning an Oscar has no effect on the salary of an actress according to Regression 1.

The other results for Regression 1, for the most part, make sense intuitively. If an actor or actress receives a percentage of the profits or gross revenue for a given film, their base salary on that film will decrease by $943,232.80. This result is significant at the 5% level. The coefficient on the Budget variable is a positive 0.04 and is statistically significant at the 1% level. Interpreting this result, a $1 increase in the budget of a particular film resulting in a $0.04 increase on salary. Similar to the Oscar variable, the Other Awards variable is significant at the 5% level with a positive coefficient of 465,446.10. Therefore, winning a Golden Globe, Emmy, or Oscar besides their first lead Oscar increases salary by $465,446.10. Notice, this increase is not as strong as the Oscar affect. The estimated coefficient on Decay is negative and significantly significant at the 5% level, and the estimated coefficient on $Decay^2$ is positive and statistically significantly at the 1% level. For films released by an Academy Award winning actor or actress following receiving the award, that actor's salary will change by $10,747.98*(Number of Films since winning) – $173,121.50, implying that the effect of winning an Oscar fully decays after about 16 films.

Age has significant effects at the 1% level for both men and women in the sample. The coefficient on Age and the Female Age interaction term are both positive. Therefore, age more positively affects women's salaries in the sample. The coefficient on the Age^2 and Female Age^2 interaction terms are both negative. So the gains from aging wear off quicker for women. A one-year increase in the age of male actors has a $530,513.10 – $11,137.30*(Age) change in salary. A one-year increase in the age of actresses has a

$1,192,312.10 – $26,967.40*(Age) change in salary. These estimates suggest that men's salaries begin increasing more from aging than women by about age 42. Also, aging does not have a negative effect on salary until age 48 for men and age 44 for women.

The results of Regression 2 are also summarized in Table IV. This regression includes the Box Office variable but does not include Other Awards. I find that Box Office has a significantly positive effect on salary at the 5% level. A $1 increase in previous career domestic box office revenue increases salary by $0.003.

As shown in Table IV, the addition of the Box Office variable and elimination of the Other Awards variable affects the significance of several variables but not the sign of any coefficients. The absolute value of every coefficient in Regression 1 decreases in Regression 2. Both the Decay and Points variables are no longer significant in Regression 2. Most importantly, the Oscar variable is now significant at the 10% level instead of the 5% level, and the Female Oscar variable is now not quite significant with a t-statistic of -1.63. The significance level of every other variable in the sample decreases by one level.

When using robust standard errors with clustering in Regressions 1 and 2, a similar story can be seen. The Female Oscar variable is no longer quite significant in Regression 1 and 2 with t-statistics of -1.57 and -1.03 respectively. While the variable is still close to significant at the 10% level in Regression 1 with a 12.7% probability, Female Oscar is highly insignificant in Regression 2 with robust standard errors (31% probability). With robust standard errors in Regression 2, the Points variable becomes significant at the 5% level as opposed to insignificant without. The results of Regressions 1 and 2 using robust standard errors with clustering are displayed in Table V.

TABLE V
REGRESSION RESULTS ON SALARIES OF COMPLETE DATASET
USING ROBUST STANDARD ERRORS WITH CLUSTERING

Variable	(1)	(2)
Oscar	1,805,489.00	1,540,107.00
	(2.54)**	(1.77)*
Female Oscar	-2,145,604.00	-1,720,171.00
	(1.57)	(1.03)
Points	-943,232.80	-757,168.50
	(3.35)***	(2.27)**
Budget	0.04	0.04
	(3.35)***	(3.27)***
Age	530,513.10	422,605.90
	(4.48)***	(3.47)***
Female Age	661,799.00	634,885.20
	(2.61)***	(2.21)**
Age^2	-5,568.65	-4,316.82
	(4.23)***	(3.91)***
Female Age^2	-7,915.05	-7,356.76
	(2.95)***	(2.39)**
Decay	-173,121.50	-137,041.60
	(2.12)**	(1.58)
$Decay^2$	5,373.99	4,434.41
	(2.37)**	(2.11)**
Other Awards	465,446.10	
	(2.49)**	
Box Office		0.003
		(2.31)**
Observations	231	204
Groups	33	32

Notes: Both regressions are one-way fixed effects regressions on salary. Regression (1) contains the Other Awards variable and not the Box Office variable. Regression (2) contains the Box Office variable and not the Other Awards variable. Absolute values of t-statistics are in parentheses. * Significant at 10% level. ** Significant at 5% level. *** Significant at 1% level.

V. B. Modified Dataset

The elimination of the 6 lowest paid actors has important implications on the regression results as shown in Table VI. Most importantly, in Regression 1 the Oscar and Female Oscar variables are now significant at the 1% level as opposed to the 5% level in the complete dataset. Similarly in Regression 2, Oscar and Female Oscar are now significant at the 5% level as opposed to in the complete dataset where Oscar is significant at 10% level and Female Oscar is insignificant.

Certain variables experience different effects from modifying the dataset. The Points variable is now significant only at the 10% level in Regression 1 as opposed to the 5% level in Regression 1 on the complete dataset. The same occurs in Regression 2 for the Age, Age^2, and $Decay^2$ variables.

In Regression 1, winning an Academy Award for Lead Actor causes salary for those men to increase by $2,479,770.00. The effect of the Oscar win on actresses in the sample is $2,737,102.00 less than for men. As before, testing the combined significance of the two variables, the pure effect of winning the Academy Award for women is not statistically significant. In Regression 2, the salary benefit for the Oscar win for men is equal to $2,242,785.00. Women experience a $2,341,052.00 lower salary benefit then men. However, once again winning an Academy Award does not significantly affect the actresses in this sample's salary.

Also in Regression 1 on the modified dataset, receiving Points lowers an actor's salary by $1,038,042.00. An increase in the budget of a film by $1 increases actors in the modified dataset by $0.04. Increasing a male actors age by 1 year causes a change of $491,737.30 - $10,108.62*Age. For women in the sample, the effect of aging 1 year is a

TABLE VI
REGRESSION RESULTS ON SALARIES OF MODIFIED DATASET

Variable	(1)	(2)
Oscar	2,479,770.00	2,242,785.00
	(2.76)***	(2.23)**
Female Oscar	-2,737,102.00	-2,341,052.00
	(2.62)***	(1.96)**
Points	-1,038,042.00	-885,299.90
	(1.89)*	(1.45)
Budget	0.04	0.04
	(4.49)***	(4.29)***
Age	491,737.30	404,171.90
	(2.98)***	(1.69)*
Female Age	715,265.00	688,508.90
	(2.64)***	(2.20)**
Age^2	-5,054.31	-4,151.83
	(2.83)***	(1.82)*
Female Age^2	-8,545.25	-7,874.63
	(2.82)***	(2.27)**
Decay	-187,401.70	-155,154.40
	(2.05)**	(1.47)
$Decay^2$	5,713.38	4,857.37
	(2.57)***	(1.92)*
Other Awards	435,743.90	
	(1.98)**	
Box Office		0.002
		(1.75)*
Observations	198	176
Groups	27	26

Notes: Both regressions are one-way fixed effects regressions on salary. Regression (1) contains the Other Awards variable and not the Box Office variable. Regression (2) contains the Box Office variable and not the Other Awards variable. Absolute values of t-statistics are in parentheses. * Significant at 10% level. ** Significant at 5% level. *** Significant at 1% level.

$1,207,002.30 – $27,199.12*Age. As before, by about age 42 men begin gaining more from aging than women. Also as in the complete dataset, women begin to receive a decrease in salary due to aging by about age 44. For men in the modified dataset, this salary deduction from aging does not occur until about age 49. According to Regression

1 for each film after winning an Academy Award, salary changes by $5,713.38*(Number of Films) – 187,401.70. As in the complete dataset, the gains from the Oscar do not fully decay until about 16 movies after winning. Finally, winning an Emmy, Golden Globe, or an Oscar besides the actor's first Lead award increases salary by $435,743.90.

Similar results can be seen in Regression 2. The absolute value of each coefficient decreases slightly from Regression 1, but the sign of each coefficient remains the same. The Box Office variable is significant at the 10% level in the modified dataset. A $1 increase in total career box office increases an actor's salary by $0.002.

Using robust standard errors with clustering affects the results of Regressions 1 and 2 in the modified dataset somewhat, but not to the same degree as in the complete dataset. In the case of Points, the addition of robust standard errors with clustering makes the variable statistically significant at 1% level in Regression 1 and the 5% level in Regression 2. In the complete dataset, robust standard errors made the Female Oscar insignificant in Regression 1 and highly insignificant in Regression 2. In the case of the modified dataset, Female Oscar is still significant at the 10% level in Regression 1. In Regression 2, Female Oscar becomes just insignificant with a t-statistic of -1.41. The results of Regressions 1 and 2 in the modified dataset using robust standard errors with clustering are shown in Table VII.[2]

VI. CONCLUSIONS

My regression results clearly display that winning an Academy Award for Lead Actor causes men's salary to increase substantially. The regression proves that winning

[2] If both the OtherAwards and BoxOffice variables are removed from the model, the Oscar and FemaleOscar variables are highly significant due to multicollinearity.

TABLE VII
REGRESSION RESULTS ON SALARIES OF MODIFIED DATASET
USING ROBUST STANDARD ERRORS WITH CLUSTERING

Variable	(1)	(2)
Oscar	2,479,770.00	2,242,785.00
	(3.39)***	(2.54)**
Female Oscar	-2,737,102.00	-2,341,052.00
	(2.01)*	(1.41)
Points	-1,038,042.00	-885,299.90
	(3.21)***	(2.31)**
Budget	0.04	0.04
	(3.15)***	(3.09)***
Age	491,737.30	404,171.90
	(4.30)***	(3.19)***
Female Age	715,265.00	688,508.90
	(2.78)***	(2.32)**
Age^2	-5,054.31	-4,151.83
	(4.22)***	(3.71)***
Female Age^2	-8,545.25	-7,874.63
	(3.13)***	(2.47)**
Decay	-187,401.70	-155,154.40
	(1.84)*	(1.42)
$Decay^2$	5,713.38	4,857.37
	(2.38)**	(2.04)**
Other Awards	435,743.90	
	(2.12)**	
Box Office		0.002
		(2.23)**
Observations	198	176
Groups	27	26

Notes: Both regressions are one-way fixed effects regressions on salary. Regression (1) contains the Other Awards variable and not the Box Office variable. Regression (2) contains the Box Office variable and not the Other Awards variable. Absolute values of t-statistics are in parentheses. * Significant at 10% level. ** Significant at 5% level. *** Significant at 1% level.

an Oscar increases a male winner's salary by 81% holding all other variables constant.[3] Clearly, winning an Academy Award sends a signal to film producers and distributors

[3] Coefficient on Oscar variable in Regression 1 on the modified dataset is compared to the mean salary of all men in the modified dataset to obtain 81% figure.

that this actor must be worth a larger salary. The demand for male actors that can carry a film's financial success causes a salary boost for Oscar winning men.

Female winners do not experience this same clear boost in their salaries. Depending upon the specification of the model used, women, experience significantly lower salary increases from winning an Academy Award than men. In such cases, winning an Academy Award did not have a statistically significant effect on women's salaries in the sample.

The regression results prove that women do not experience the same salary signal from being admitted into a select group of the top actresses in Hollywood. Men, however, send this signal to their potential employers that they are one of the top actors and, therefore, deserve a higher salary for their abilities. There are two possible reasons for the fact that actors and actresses do not send the same signal after being regarded in the same manner. First, this could possibly mean that winning the Lead Actor Academy Award is regarded as more of an accomplishment than winning the Lead Actress Academy Award. Perhaps this could simply be due to the way in which the Awards ceremony is organized. Speaking from personal experience, I have always felt that more emphasis is put on the Lead Actor award when watching the ceremonies. It's possible that this explanation displays some sort of gender bias on the part of The American Academy of Motion Pictures and Sciences. This explanation could also be explained as being due to differences in the competition associated with winning the Lead Actor award as opposed to the Lead Actress award. Perhaps, it is simply more difficult to win the Lead Actor award and men should be rewarded more highly. Finally, this explanation could be explained by societal views about the Academy Awards and gender. It is

possible that the population regards the Lead Actor award as being more valuable than the Lead Actress award. All of these explanations (except perhaps the competition argument) seem to still point to some sort of gender bias facing women in Hollywood.

Secondly, the difference in signals can be explained by industry-wide gender bias. I personally believe that there are more starring roles available to men in Hollywood than there are for women. This would then mean that the demand is higher for men who have proven that they are accomplished actors than it is for accomplished actresses. Men who have won the Academy Award for Lead Actor enter a select group of proven stars. They have also received a great deal of media and societal attention in winning the award. It makes perfect sense then that they would receive a higher salary for the next roles. Producers and directors realize that these men are great actors and are bound to improve the quality of the film they're making. Ultimately, a good movie will attract audiences and make money for the people behind the film. As well, the media attention that the actor has received for winning the Academy Award acts as an advertising campaign for his next movies. The actor is highlighted as an Academy Award winner on commercials, billboards, and posters. This also potentially attracts audiences to movies and generates profits. It is obvious that this award should earn an actor a higher salary. However, the reasons I've just highlighted do not seem like they should be gender specific. An Academy Award winning actress receives the same marketing strategy, and she has also been proven as an amazing actor. Ultimately, it is my opinion that male winners benefit more from this award due to the higher demand of men for starring roles.

This paper also proves other indicators of salary in Hollywood. Budgets are shown to be important indicators of how actors and actresses are paid. This makes

perfect sense intuitively. Golden Globes, Emmys and other Academy Award (besides first Lead Actor or Actress) wins are also proven as salary boosters. The results display interesting effects of aging on salary. The average age of men in the modified dataset at the time of winning the award is 43.214. The average age of women in the dataset at the time of winning is 31.143. Of the 83 Lead Actor awards given out in the Academy Award's history, the average age of winners is 44.674. The average age of winners for the Lead Actress award is 36.771.[4] Clearly women must win earlier in their careers than men. I believe this makes a great deal of sense and also displays some sort of gender bias in the way that roles are given to men and women. This could perhaps suggest that younger women receive award-winning roles younger in the careers since younger women are in higher demand in Hollywood. Perhaps counter intuitively, the linear affect of aging on salary is higher for women than it is for men. However, these effects diminish quicker for women than for men. Men begin to earn more for aging at age 42. This switch falls just about in line with the average age of male winners.

According to the means displayed Table II, actresses in the sample have an average salary that is 102% higher than men before winning the Academy Award. After winning, the average salary of the men in the sample is 59% higher than women after winning. Clearly, Academy Award winning women are earning more money prior to winning the award than men are. They are winning the award younger in their careers, and women are benefitting more from aging up until age 42. Based on these three ideas, evidently age plays a huge role on gender bias in Hollywood. Actresses seem to be much

[4] Both the comprehensive average ages of Lead Actor and Lead Actress awards are calculated at the time of winning for each instance the award has been won. This includes actors and actresses who have won multiple times as well as winners who tied.

more highly valued at younger ages relative to actors. I believe this is due to the way the film industry values women. Women, more so than men, are most likely valued for their physical beauty along with their ability to act. While I am not claiming that the same sort of attractiveness is not demanded of men in Hollywood, I believe that perhaps these physical traits are more desired by filmmakers out of the actresses they employ in their movies. While there is perhaps no way to prove how one's salary is based on attractiveness, I believe these age effects are possibly telling such a story.

In the case the case that women are rewarded more significantly for their physical attributes over their acting abilities relative to men, certainly the effect of winning an Academy Award would be less beneficial for actresses relative to actors. Perhaps veteran experience and proven acting ability is something that is in higher demand for men in Hollywood than it is for women. Whatever the case, it is my opinion this lack of a significant effect on women's salary after winning an Academy Award depicts some evidence of gender bias within the film industry.

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VIII. APPENDIX

TABLE VIII
ACTORS AND ACTRESSES IN THE DATASET

Actor/Actress	Award Year	Mean Salary
Gary Cooper*	1942	$841,395.89
Laurence Olivier*	1949	$515,466.00
Humphrey Bogart*	1952	$702,516.44
William Holden	1954	$1,262,148.89
Marlon Brando	1955	$1,784,583.07
Charlton Heston*	1960	$374,261.29
Burt Lancaster*	1961	$493,730.28
Sidney Poitier*	1964	$366,946.22
Rod Steiger	1968	$1,035,688.85
John Wayne	1970	$929,997.33
Gene Hackman	1972	$1,622,709.17
Jack Nicholson	1976	$4,938,436.82
Dustin Hoffman	1980	$1,921,648.02
Robert Deniro	1981	$5,942,951.58
Paul Newman	1987	$1,818,511.36
Al Pacino	1993	$2,214,491.45
Tom Hanks	1994	$5,040,446.77
Nicolas Cage	1996	$4,607,096.69
Russell Crowe	2001	$6,856,242.49
Denzel Washington	2002	$8,376,208.90
Ingrid Bergman	1945	$635,487.46
Audrey Hepburn	1954	$1,447,274.69
Elizabeth Taylor	1961	$2,156,705.94
Julie Christie	1966	$675,731.88
Glenda Jackson	1971	$667,937.10
Meryl Streep	1983	$1,375,315.17
Cher	1988	$1,052,687.17
Jodie Foster	1989	$5,258,075.07
Gwyneth Paltrow	1999	$2,948,043.52
Hilary Swank	2000	$847,879.47
Julia Roberts	2001	$5,495,022.71
Halle Berry	2002	$2,872,482.89

Nicole Kidman	2003	$3,622,979.26
Reese Witherspoon	2006	$5,334,010.93

Notes: * = Actors that are removed to form the modified dataset