Do female CEOs add value for stockholders? A case study of Yahoo!

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ABSTRACT

This paper presents an analysis of financial performance of male and female CEO's in Yahoo, Inc. which has appointed two female CEOs in the last five years. The study uses two metrics to evaluate the financial performance of CEOs. The one uses event study methodology to examine the announcement effects of both male and female CEOs on the stock price. It examines the significance of abnormal returns with the appointments of CEOs. The second metric is Economic Value Added (EVA), which examines the returns generated over and above the weighted average cost of capital with different CEOs. This methodology has not been used to date to discern differences amongst CEOs based on gender. Using data from CRSP, Value Line and Compustat, the research finds no difference in the relative performance of female CEOs and male CEOs.

Keywords: Corporate Finance, Financial Performance, Financial Management, Gender, Announcement Effect, CEOs, Event Study, Economic Value Added, Yahoo!

INTRODUCTION

The appointment of female CEO's is treated as newsworthy in both popular and business press. There is a record number of female CEO's in 2013 in Fortune 500 companies, though it is a small percentage of the female working population and then a smaller proportion of females in the total population in the US. There have been several studies in the area of hurdles within and outside the organizations in the appointment of female CEO's. Less studied has been the area of differential financial performance of female and male CEO's. This paper adds to this area by examining a case study of Yahoo, a Fortune 500 company, which has appointed two female CEOs in the last five years. It looks at the announcement effects in the stock market of CEO appointments of both female and male gender, and also analyses the Economic Value Added (EVA) by the female and male CEOs in Yahoo. The paper is divided into four parts--- Review of the Literature in this area, Methodology used, Empirical Results, and Summary and Conclusions.

Review of the Literature

One of the earlier studies by Lee and James (2003) found that the announcement of a female CEO creates negative impact on the stock price, whereas another study by Bertrand and Schoar (2003, 2009) finds that managerial style and prior experience of CEO, and not gender, are the primary determinants of the long run success of a firm. Another study in the same vein by Dezso and Ross (2008, 2012) examined 1500 US firms that female participation below the CEO rank enhances firm performance. Gender diversity below the CEO levels increases Tobin's Q, but female CEOs do not enhance value and may slow the growth rate of firms. Recent paper by Kevin, McGuinness and Vieto (2012) finds that gender of CEO did not have any significant impact on the performance of a firm, as measured by ROE.

Another related research in this area is that female CEOs are hired when the firms are not likely to do well and hence female CEOs do not perform well. This has been called "Glass Cliff Effect" by Ryan and Haslam (2005a, 2007, 2009); However, on the contrary, a study by Adams,Gupta and Leeth (2009) finds, after analyzing Fortune 1500 US companies, that "Glass Cliff" does not exist and hiring practices at the board level are not gender biased.

This paper focuses on only one of the Fortune 500 companies Yahoo, which has appointed two female CEOs in the last five years. The only other company that has appointed two female CEO's is Hewlett Packard. Therefore a case study methodology (Yahoo in this case) can shed more light. It can allow comparison between female and male CEO's appointments for the same entity, while minimizing effects of aggregation in the large sample. This paper compares the announcement effects of female and male CEO's for Yahoo by using the methodology of Abnormal and Cumulative Abnormal Returns (AR's and CAR's). In addition, this paper investigates any differences due to the gender of CEOs, by using the methodology not used in this context so far, is Economic Value Added (EVA), which is returns over and above the costs of capital (both debt and equity) for Yahoo. Below is a brief description of the background of Yahoo and its CEOs.

BACKGROUND OF THE COMPANY

In 1994 David Filo and Jerry Yang two Ph.D. candidates in electrical engineering at Stanford University initiated Yahoo in order to consolidate all the websites. The consolidation

would provide easy access and opportunities for advertising revenues. Tim Koogle was the company's first CEO. He tried to build Yahoo as "one stop shop". Soon the competition increased and technology changed. Yahoo's stock continued to fall SO MUCH that in late 2008, Microsoft announced that it wanted to acquire Yahoo for $40 billion. By 2010 its share of the search engine market had fallen dramatically from over 30% to around 12%. In 2000, Yahoo's stock price reached its peak at $237 per share; but by 2011 Yahoo's stock price was only$15. The firm had substantial overhead expenses.

Ms Carol Bartz became CEO of Yahoo in January 2009. She adopted the cost cutting strategy. The stock price rose 5% in the middle of 2009 over the previous year's stock price. Yahoo tried to improve its search technology and bought several search companies like Inktomi and Overture and launched its own program--- Project Panama. Yahoo later formed a strategic alliance with Microsoft, which allows it to use the Bing search engine. Currently Yahoo is trying to cut costs and acquire companies. Acquisition of Tumblr is an example. Yahoo is unique, as it has had eight CEOs in its history of eighteen years, three (excluding two interim) in the last five years and two of three have been females. So, Yahoo can provide a good case study whether gender of the CEOs has an impact on the value of a firm. Table 5 summarizes the name and education of the CEOs of Yahoo.

Methodology and Data

In order to examine the gender differences in CEOs performance, the research uses stock price returns using technical analysis, and event study which examines statistical significance of abnormal returns to the appointment of female and male CEOs. In addition, it also uses methodology of Economic Value Added (EVA) to find any significant differences in the performance of male and female CEOs. Both of these methodologies are explained below:

Technical Analysis looks at the graph of stock price over an extended time and tries to discern any change in the stock price following appointments. It is visual information, which is being interpreted. Campbell and Vera (2010) use this approach, to identify shareholders reaction toward the appointment of female board members in Spain.

Another rigorous methodology, Event Study, is to assess if there are any significant differences in abnormal returns to the appointments of male and female CEOs. This approach can be described as follows:

Fama (1970) states that financial markets are efficient, which implies that all relevant information for the pricing of assets is reflected in the stock price immediately after the announcement. If the EMH is correct, it is impossible for investors, with all information available to beat the market. Empirical financial research enables us to assess the impact of a particular event on a firm's stock price. The event study methodology has become very popular to assess the abnormal market return and security price behavior after an event such as change in leadership (Binder 1998).

The abnormal return due to the event is the difference between the stock's actual return and a proxy for the stock's return in the absence of an event. It uses market model, which assumes a stable linear relation between market return and security return (Mackinley 1997, and Ishak, Rokiah and Rohaida ,2012).

The expected return in the Market Model can be described as

$$R_t = \alpha + \beta R_{mt} + e_t \qquad (1)$$

Where, R_t is the continuously compounded return to an individual security at time t, R_{mt} is continuously compounded returns at time t of the market portfolio, and e_t is the error term. Abnormal Return (AR) is calculated in the event window, by using α, β estimates from equation (1).

$$AR_t = R_t - (\alpha + \beta r_{mt}) \quad (2)$$

Cumulative Abnormal Return (CAR) is the summation of all the AR's returns in the 31 days event window.

$$CAR_i(t_1, t_2) = \sum_{i=-15}^{i=+15} AR_i \quad (3)$$

Statistical tests are used to assess the significance of these numbers following Mackinley (1997). In order to find out the significance of Abnormal Return, the following equation is used.

$$AR_t = R_t - (\alpha + \beta r_{mt}) \,/\, \sqrt{\sigma^2} \quad (4)$$

Where $\sqrt{\sigma^2}$ is the standard error computed from the OLS regression in equation. We also aggregate the abnormal returns over the event period (-15, 0, +15) to obtain the cumulative abnormal return (CAR) as shown in Equation 3.

This paper considers three events---the appointment of three CEO's ---Ms Carol Bartz, Mr. Scott Thompson, and Ms Marissa Mayer. The event period is from 15 days before the event is announced to 15 days after the event is announced. The day of the CEO appointment is defined as $\tau = 0$ in event time. The market model, in this paper, is estimated with estimation window for returns of 252 days, for each event.

Figure 1: Event Study using 283 days daily return from Yahoo and Nasdaq

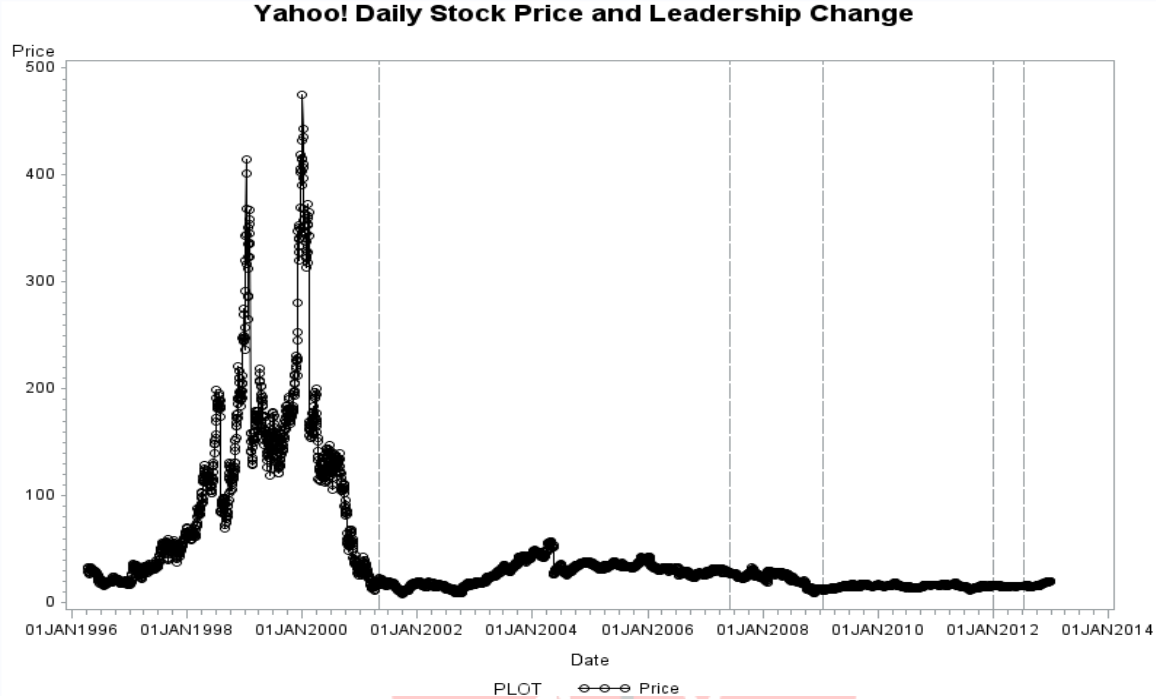
Estimation Window	L_1	252 days	Event Window
Event Window	L_2	31 days	-15 days $\tau = 0$ +15 days
Total days in Event	$L_1 + L_2$	283 days	

The paper uses daily return data for each event---appointment of male and female CEO's. The data were obtained from CRSP Market Index and Yahoo Finance. Market return is the NASDAQ Composite Market Index. The results are presented in the next section.

This study also uses another methodology named EVA, which computes excess value created over and above the costs of capital. EVA essentially measures additional wealth created/destroyed. If Net Operating Profits after Taxes exceed the firm's costs of debt and equity capital, the firm/CEO has created wealth. If NOPAT equals total costs of equity and borrowed capital, it has not created wealth, and of course if NOPAT is less than the costs of capital, it has lost value. It is worth noting that the costs of debt and equity are being calculated at the market rates. The total cost is the dollar cost of debt and equity employed by the firm. The paper uses time period from June 2007, when Jerry Yang became CEO, through second quarter of 2013, while Marissa Mayer is the CEO. Quarterly EVA, natural log of EVA, and NOPAT are calculated using data from Compustat Data. T-tests are performed to test for the significance of differences between male and female CEOs. Also regression analysis on EVA is used to test for the significance of gender of the CEOs using dummy variable approach. Calculation of quarterly EVA was done as described in Appendix1 at the end. Also the regression equation using control variables and dummy variables is explained in Appendix 2. Appendix 3 is the T-test significance of Mean Differences of Variables based on gender.

Empirical Results

Figure 2: Analysis of average stock price from 12 April1 1996—31 December 2012



As indicated in Figure 1, a visual look suggests that there has been no major upturn or downturn in the stock price in the last five years. Of course, Yahoo had high stock price in its early days, but there has been no change in the value of firm since 2009. Therefore appointment of female CEOs does not detract or add to the value of firm. Below is a table of the monthly stock price of Yahoo since Jan. 2, 2009---the date Ms Carol Bartz was appointed as CEO, through the end of 2012. There has been no major change in stock price. Mr. Scott Thompson was appointed in January 2012, and Ms Marissa Mayer was appointed in July 2012. Therefore one can infer from the chart and graph that gender has played no role, positive or negative, in the value of firm.

Results of Event Study

As indicated in Table 1, Abnormal Returns (ARs) and Cumulative Abnormal Returns (CARs) demonstrate that the appointment of female or male CEOs has not created statistically significant returns for two weeks prior and two weeks after the appointment of CEO. There was significant presence of Abnormal Return (AR) eight days prior to the appointment of Mr. Scott Thompson. It could have been for some other reason/event. However, in general gender of the CEO does not play any systemic role in creating value for shareholders.

Results from EVA Analysis

Table 2 represents the description of the variables. Table 3 summarizes the descriptive statistics of the regression variables.

The regression results of CEO Gender on EVA are indicated in Table 4. As indicted in table 4, model 1, the relationship between Gender of CEO (dummy Variable Female=1; Male=0) and EVA is negative and significant. However this relationship requires a closer analysis. It includes all four quarters of 2008, which was an unusual year. NASDAQ Index had dropped by

42.70%, which makes calculation of EVA for that year to be different. Such a major drop makes the WACC in dollars a large negative, and EVA (NOPAT minus WACC$) becomes a much larger positive number relative to other quarters. Therefore, in this paper, two methods are applied to minimize the impact of a very large EVA number from year 2008. One method is to treat all EVA numbers positive and take natural logs, and run regressions with dependent variable Ln EVA Q as indicated in table 4 model 2 and 5. Second method is to drop year 2008 and re-run the regression and the results are presented in model 3 and 6. Model 1&4 use Quarterly EVA (EVA_Q), as the dependent variable. Model 2&5 use logarithm of quarterly EVA (Ln_EVA_Q), and Model 3&6 use quarterly EVA without year 2008 (EVA_no 08) as dependent variables. CEO_Gender variable is not significant, when the dependent variable Quarterly EVA either has been normalized or four quarters of year 2008 have been deleted.

CONCLUSION

Females are underrepresented at the CEO level, as a percentage of the CEOs or as a percentage of female working population. Various reasons for this phenomenon such as style of management, glass ceiling and other reasons have been discussed in the business literature However the finance profession is debating the issue whether gender has an influence in creating value for a firm. Previous studies have not been definite in results. This paper instead of focusing on a large sample, takes another approach of using a case study. In addition, it also applies EVA methodology, not used so far in this context, to the issues of gender relevance in creating value for shareholders.

This paper focuses on Yahoo, a company with glorious beginning, and now struggling to survive in the technology industry. Yahoo, one of the Fortune 500 Companies provides a good case to study the impact of gender of CEO, as it is only one of the two companies that have appointed two female CEOs in the last five years. This study examines using technical analysis, event study, and EVA methodologies whether gender of CEO has played any part in creating value for stockholders. The results demonstrate that gender of the CEO has not been influential in creating value for Yahoo. However it does not imply that females should not be appointed as CEO's. It may be desirable to appoint females to create a larger pool of potential CEO's. Also this study and methodology focuses on only short term results. Value creation for stockholders is complex involving strategy, its implementation and different managerial styles of CEO's. The authors believe that more case studies linking strategy, execution and different managerial styles would add to the literature of determinants of how to create value for shareholders.

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APPENDIX

Table 1: Event Study Results Using Market Model

Event Day	Carol Bartz		Scott Thompson		Marissa Mayer	
	AR	CAR	AR	CAR	AR	CAR
-15	0.0168	0.0026	-0.0164	-0.0145	0.0064	-0.0100
-14	-0.0335	-0.0308	0.0094	-0.0051	-0.0112	-0.0213
-13	0.0119	-0.0189	-0.0104	-0.0155	-0.0060	-0.0273
-12	-0.0105	-0.0294	0.0087	-0.0068	0.0108	-0.0165
-11	-0.0020	-0.0314	-0.0187	-0.0255	-0.0026	-0.0191
-10	-0.0255	-0.0569	-0.0101	-0.0356	0.0229	0.0038
-9	-0.0177	-0.0746	0.0020	-0.0336	0.0013	0.0051
-8	0.0030	-0.0716	0.0681***	0.0345	0.0098	0.0149
-7	0.0203	-0.0513	-0.0075	0.0270	-0.0066	0.0083
-6	0.0028	-0.0485	0.0047	0.0316	-0.0080	0.0002
-5	-0.0034	-0.0519	-0.0086	0.0231	-0.0049	-0.0047
-4	0.0074	-0.0444	-0.0059	0.0171	0.0032	-0.0015
-3	0.0175	-0.0269	0.0132	0.0303	-0.0039	-0.0054
-2	0.0304	0.0035	0.0034	0.0337	-0.0068	-0.0122
-1	-0.0502	-0.0467	-0.0065	0.0271	0.0034	-0.0088
0	-0.0148	-0.0615	-0.0311	-0.0040	-0.0057	-0.0144
1	0.0595	-0.0020	-0.0168	-0.0208	-0.0068	-0.0212
2	-0.0787	-0.0807	-0.0092	-0.0300	0.0039	-0.0173
3	-0.0129	-0.0936	-0.0047	-0.0347	0.0004	-0.0169
4	0.0035	-0.0900	-0.0063	-0.0410	0.0109	-0.0060
5	0.0095	-0.0805	-0.0017	-0.0427	-0.0104	-0.0164
6	-0.0014	-0.0819	0.0034	-0.0392	-0.0207	-0.0371
7	-0.0043	-0.0862	-0.0064	-0.0456	0.0050	-0.0321
8	-0.0213	-0.1075	-0.0094	-0.0550	0.0197	-0.0124
9	0.0052	-0.1023	0.0167	-0.0383	0.0197	0.0073
10	0.0459	-0.0564	0.0061	-0.0322	-0.0109	-0.0037
11	-0.0110	-0.0674	-0.0092	-0.0414	-0.0102	-0.0139
12	0.0182	-0.0492	-0.0165	-0.0580	0.0110	-0.0029
13	0.0241	-0.0251	-0.0002	-0.0582	-0.0161	-0.0189
14	0.0296	0.0045	-0.0195	-0.0777	0.0110	-0.0079
15	0.0257	0.0302	0.0028	-0.0749	0.0025	-0.0055

*** = Significant at 1% level (*t*-value is 3.5692)

Table 2: Descriptive Statistics (Q3, 2007—Q2, 2013)

CEO_Gender	N_Obs	Variable	N	Mean	Std Dev	Minimum	Maximum
0	9	Invested_Cap	9	11383.88	1269.60	9291.01	12859.99
		OIBD	9	361.64	59.50	314.34	497.49
		Rev	9	1619.02	275.73	1217.79	1832.00
		ACQ	9	268.61	290.97	0.00	973.58
		NOPAT	9	118.88	41.43	69.37	198.85
		EVA_Q	9	467.02	740.30	-263.97	1327.28
		Ln_EVA	9	6.03	1.08	4.49	7.19
	15	Invested_Cap	15	12930.34	1126.02	11591.26	15605.52
		OIBD	15	349.98	46.36	285.94	455.01
		Rev	15	1417.88	208.91	1135.24	1731.98
		ACQ	15	121.05	257.68	0.00	1024.16
		NOPAT	15	115.83	29.44	68.57	173.31
		EVA_Q	15	-462.03	390.59	-1049.22	48.89
		Ln_EVA	15	5.74	1.14	3.54	6.96

Table 3: Variable Description (all variables are of quarterly value, Source: Compustat)

VariableName	VariableTicker	Description
EVA	EVA_Q	Economic value added which is calculated by subtracting dollar-WACC from NOPAT. In our case, it is a dependent variable
Log of EVA	Ln_EVA	Natural log of EVA. We created this variable because 2008 was an abnormal year in which market return was -42.70% which makes EVA positive for 2008. However, it was negative for almost all years except 2011. Therefore, in order to avoid significant variation we created Ln_EVA
Invested capital	Invested_Cap	During our sample period Yahoo! made a lot of investment in other software companies in the form of buying non-controlling interest. Therefore, we believe invested capital would an important determinant of EVA
Operating income before depreciation	OIBDP	Operating Income before depreciation. Is taken from Compustat and used as NOPAT in our calculation of EVA
Depreciation and amortization	Dep_Amor	Depreciation and amortization
Revenue	Rev	Revenues
Acquisition	ACQ	Acquisition
Net operating profit after tax	NOPAT	Net operating profit after tax
Quarter of a fiscal year	Fiscal_Q	A continuous variable that takes value of 1, 2, 3, and 4 for quarter 1,2,3,4

Table 4: OLS analysis determinants of probability of CEO Gender on EVA

Model	(1) EVA_Q Coefficient (p-value)	(2) Ln_EVA_Q Coefficient (p-value)	(3) EVA_no 08 Coefficient (p-value)	(4) EVA_Q Coefficient (p-value)	(5) Ln_EVA_Q Coefficient (p-value)	(6) EVA_Q _no 08 Coefficient (p-value)
Intercept	467.02**	6.03***	-150.35	-5,403.18*	10.45***	1,358.14
	(2.57)	(16.12)	(-0.96)	(-2.05)	(-3.08)	(1.09)
Invested_Cap				0.16	0.0006***	-0.03
				(1.09)	(3.49)	(0.50)
OIBDP				4.45	-0.0038	5.43***
				(1.67)	(-1.07)	(3.40)
Rev				0.38	0.005***	
				(0.40)	(4.13)	
ACQ				0.33	0.0000009	0.28
				(0.71)	(-0.02)	(1.34)
Fiscal_Q				-195.57	-0.19	-69.73
				(-1,53)	(-1.16)	(-1.11)
Dep_Amor				12.34	0.01	-18.56***
				(1.25)	(1.15)	(-3.38)
CEO_Gend	-929.05***	-0.29	-311.67	-973.18***	-0.32	-59.91
	(-4.05)	(-0.55)	(-1.72)	(-3.56)	(-0.91)	(-0.35)
R-Square				62%	74.42%	71.03%

***, **, * significant at 1%, 5%, and 10% level respectively,

Table 5: Name and Education of Yahoo CEOs 1995-2013

Name	Duration	Gender	Education	Institution
Tim Koogle	1995-May 2001.	Male	Ph.D in Engineering	Stanford University
Terry Semel	May 2001- June 2007	Male	B.S. degree in Accounting	Long Island University
Jerry Yang	June 2007-January 2009	Male	Master of Science in Electrical Engineering	Stanford University
Carol Bartz	January 2009-September 2011	Female	Bachelor's degree in Computer Science	University of Wisconsin – Madison
Tim Morse	September 2011-January 2012	Male	Bachelor's Finance and Operations	Boston College
Scott Thompson	January 2012-May 2012.	Male	Bachelor's degree in Accounting	Stonehill College
Ross Levinsohn	May 2012- July 2012	Male	Broadcast Communications	American University
Marissa Mayer	July 2012-	Female	Master of Science in Electrical Engineering	Stanford University