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# A Macro Economic Approach to Gender Disparities in Hiring at the CEO Level

Abigail Wood  
7-29-2016

## Abstract

More men named John run S&P 1500 companies than all women combined, causing many to wonder what factors are limiting women's career advancement. While many studies have been written about the topic of women's success in the business world, most focus on individual firms or positions and therefore miss macroeconomic factors such as women's completion of master's degree programs and labor force participation rates. This research examines the disparity of gender in CEO positions through the examination of macroeconomic data which captures women's career trajectory and qualifications. This research specifically examines trends in women's obtainment of master's degrees in business administration to see how their completion relates to the number of female CEOs of S&P 500 companies. Obtainment of master's degrees by women helps to examine how qualified women are to become CEOs. To assess career trajectory I examine labor force participation over time to see how women's participation may affect their ability to become CEOs. The use of the master's degree data as well as the labor force participation data allows for a more thorough examination of the disparity and its causes.

## Introduction

In 2015 more men named John run Fortune 500 companies than women (Wolfers 2015). Despite women making up half of all college graduates in the early 1980s women make up only 14% of all executive positions and 17% of board seats. This gender gap is worse for women of color who hold just 4% of top corporate jobs (Sandberg and Scovell n.d.). Experts point to many different factors to explain this gap including labor force participation, a lack of qualified women, and qualities that make women less competent.

It makes sense to assume that women are more likely than men to leave the workforce at a young age due to caretaker responsibilities. While one might think this is a gradually decreasing

occurrence, the U.S. participation rate is growing much more slowly than other developed countries in recent years (Blau and Kahn 2013). This might be particularly relevant for positions as high up as CEO because of the number of years' experience required before becoming CEO.

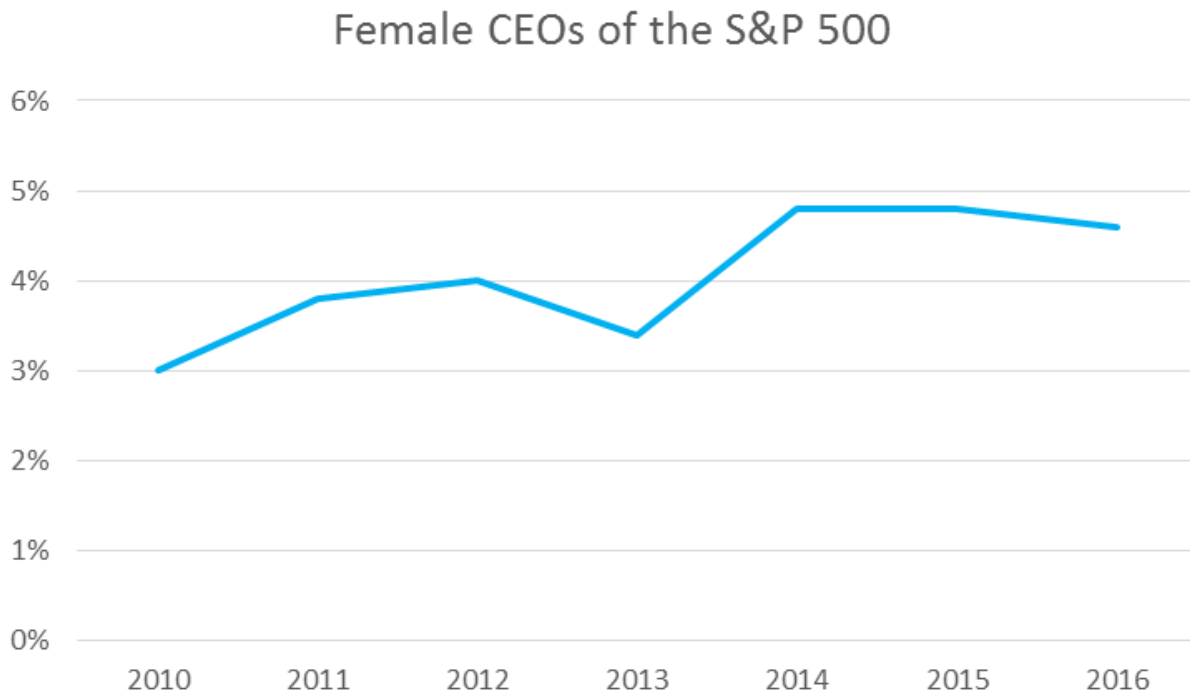
While many may argue that women are as competent as men, there is evidence to suggest this is not true. In a study about performance in competitive environments women were outperformed by men. The study was conducted by giving a group of people a simple task. This group of people was mixed in gender. When it was incentivized to be competitive men performed much better but women's performance didn't change (Gneezy, Niederle and Rustichini 2003). This indicates that women may not be as qualified to be in a competitive role like CEO. Other evidence suggests that women have different types of experience than men. This is most relevant in board positions. Those areas of expertise that women are most likely to have are also those which are most lacking on existing boards (Kim and Starks 2016).

In order to examine the specific circumstances of women's career progression, some researchers examine the factors that make up a woman's career success in comparison to men. The data shows at low levels of management women are promoted from within rather than hired externally, but at higher levels this difference is less pronounced (Gneezy, Niederle and Rustichini 2003). This indicates that women do better in the early levels of their career when they stay with one company. However, the same data showed that this trend trails off for higher positions – so this strategy loses its value early on in a women's career. Based on a meta-analysis, the level of education, hours worked, and work experience are more important in a woman's success than in a man's (Ng, et al. 2005). This is similar to conclusions made from a study of publically traded family firms, that women were hired for the CEO position only when, on average, they had previous CEO experience, had held a board position, had more years of schooling and had attended a college or graduate program (Bennedsen, et al. 2007).

## Data Collection

### CEO

The standard and poor's (S&P) list of companies consists of companies that meet liquidity benchmarks. The research used the S&P list to ensure stable companies with consistent records of success were used in the analysis. Out of the 500 companies on the S&P 500 list, 3-5% are headed by female CEOs. Below, in Figure 1, is the breakdown of the percentage of female CEOs at a snapshot in each of the years. This data was collected by news articles detailing the number of female CEOs on the S&P list.



*Figure 1*

### MBA

Data was collected from the U.S. Department of Education about the number of graduates of Masters in Business Administration (MBA) programs in various years (U.S. Department of Education 2016). The data collected included information about gender, institutions, and the number of graduates.

Data was available for the years 1980 and 1984-2014. Table 1 includes the general statistics about the MBA data. All numbers represent graduates of each program.

**Table 1: All MBA Programs**

	<b>Total</b>	<b>Men</b>	<b>Women</b>
<b>Number of Observations</b>	<b>26235</b>	<b>26223</b>	<b>26219</b>
<b>Mean</b>	<b>131.4844</b>	<b>79.04637</b>	<b>52.5062</b>
<b>Standard Deviation</b>	<b>213.1964</b>	<b>130.1257</b>	<b>90.60634</b>
<b>Minimum</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Maximum</b>	<b>5669</b>	<b>2472</b>	<b>3197</b>

**Source:** (U.S. Department of Education 2016)

In order to reflect information about the people most likely to become CEOs, a second data set was constructed with only the top 20 MBA programs according to a ranking by U.S. News (U.S. News 2016). Table 2 below details the same set of information with MBA programs only in the top 20 ranking.

**Table 2: Top 20 MBA Programs**

	<b>Total</b>	<b>Men</b>	<b>Women</b>
<b>Number of Observations</b>	<b>641</b>	<b>641</b>	<b>641</b>
<b>Mean</b>	<b>612.0109</b>	<b>429.7504</b>	<b>182.2605</b>
<b>Standard Deviation</b>	<b>361.9005</b>	<b>249.5097</b>	<b>120.046</b>
<b>Minimum</b>	<b>106</b>	<b>75</b>	<b>20</b>
<b>Maximum</b>	<b>2334</b>	<b>1393</b>	<b>941</b>

**Source:** (U.S. Department of Education 2016, U.S. News 2016)

The research used regression analysis to fill in the gaps of the years that were missing, and to project years into the future and before data was available. This analysis provided the following values.

<b>All Programs</b>	<b>coefficient</b>	<b>standard error</b>
<b>t</b>	<b>0.0167559</b>	<b>0.0010804</b>
<b>t^2</b>	<b>-0.005871</b>	<b>0.000065</b>
<b>t^3</b>	<b>0.00000887</b>	<b>0.00000115</b>

constant	0.2200012	0.0052349
<b>Top 20 Data</b>		
t	0.0021998	0.0018262
t^2	-0.0002718	0.0001099
t^3	0.000006787	0.00000195
constant	0.2952284	0.0088485

These figures were used to create graphs, as seen in Figures 2 and 3. The points on the graphs are actual data points and the line is the projected values. Figure 2 shows a clear positive trend in the number of female graduates of all programs. The current values are almost reaching 50%. This is contrasted by the data shown in Figure 3. Figure 3 shows a stagnated trend at approximately 30%. One interesting thing in this top program data, is that women made up a greater percentage of the program at the earliest data point, but barely grew past that level for many years, even now barely 5% greater than at the start.

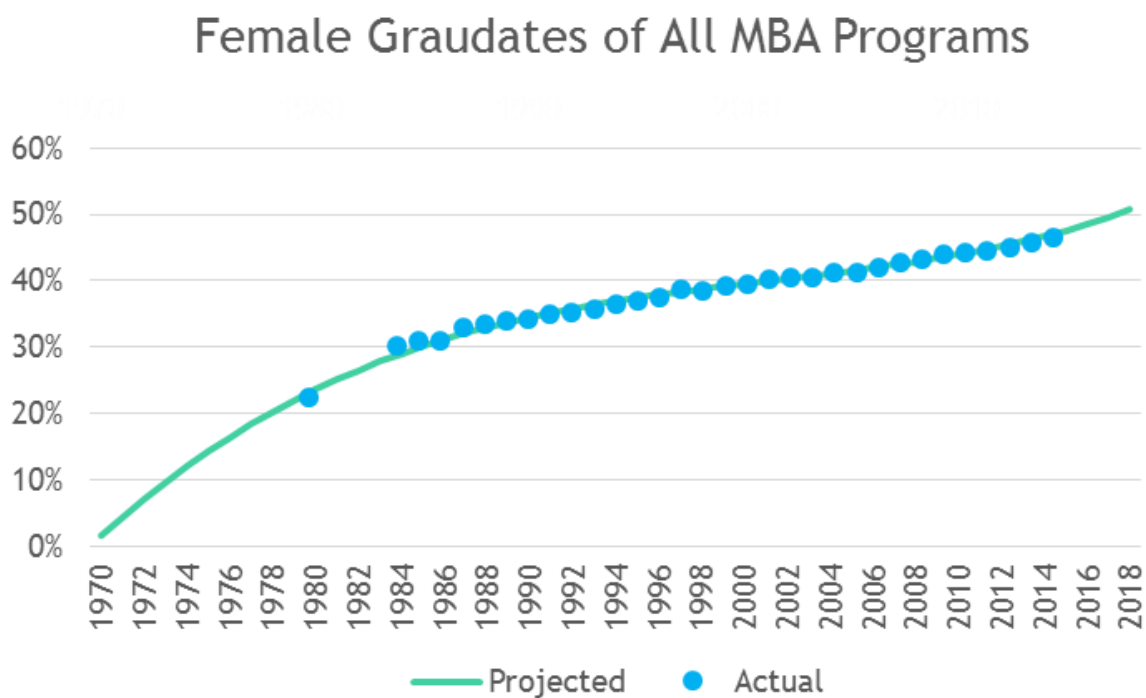


Figure 2 Source: (U.S. Department of Education 2016)

## Female Graduates of Top 20 MBA Programs

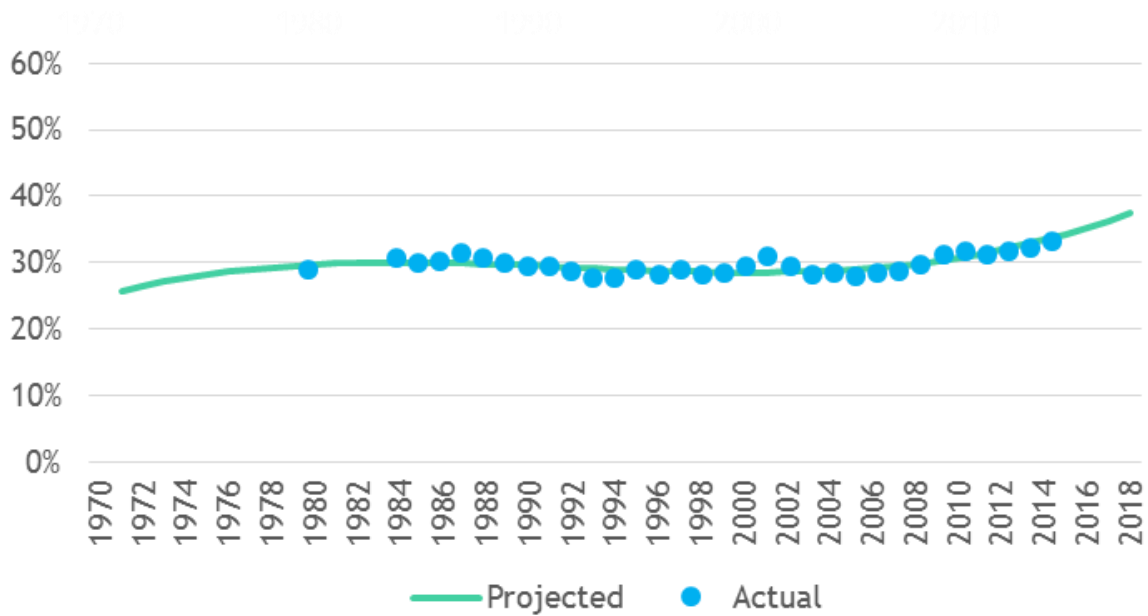


Figure 3 Source: (U.S. Department of Education 2016, U.S. News 2016)

### Labor Force Participation

The Bureau of Labor Statistics releases a civilian labor force participation rate (U.S. Department of Labor 2016). This statistic represents the number of people who have a job or are looking for a job.

The data collected is broken down by age and then tracked over time. In order to see how people with one birth year's participation rate changes, the research constructed cohort data based on the published data. Data about a specific age range's participation rate, for example people aged 25 to 29, was then matched that with birth years. For example people who are 25 in 1982 were born in 1957 so the research used the participation rate of people aged 25-29 during 1982-1986. By creating all of these birth years it is possible to track each birth year's change in participation rates.



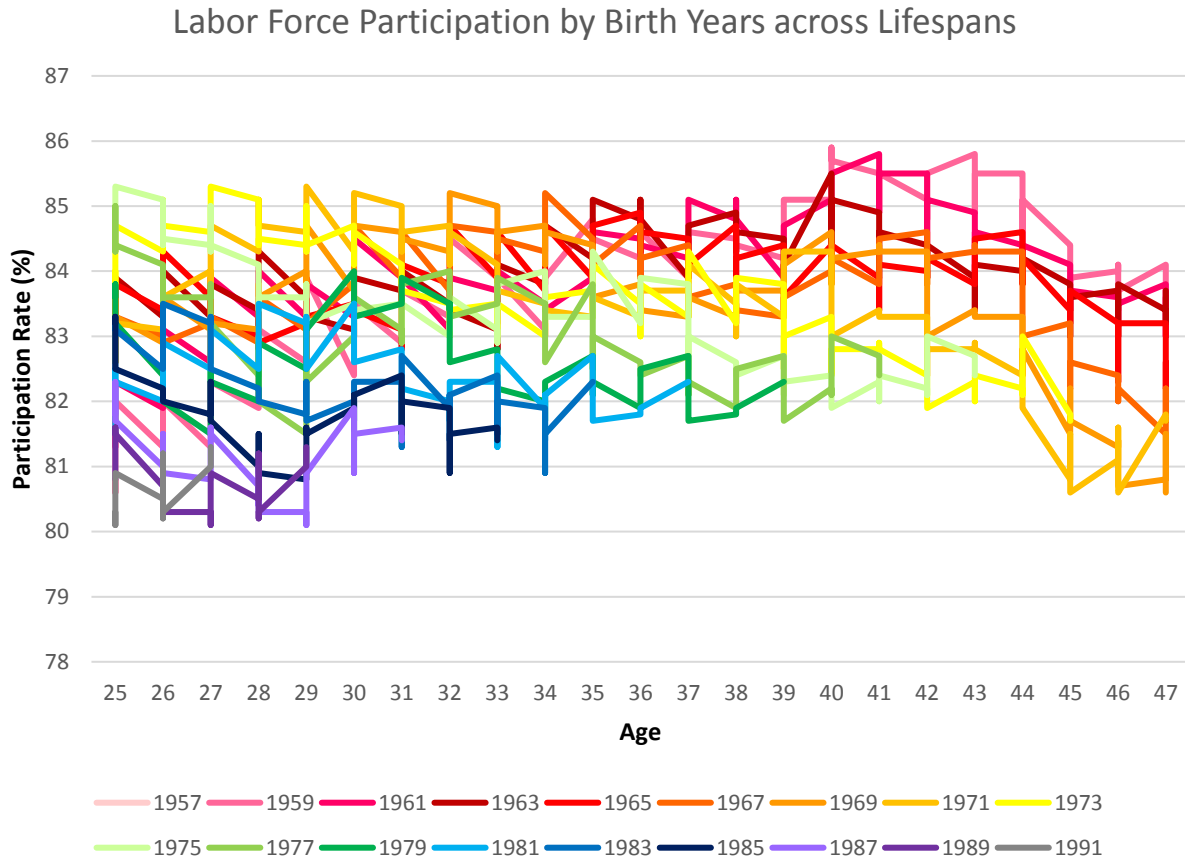


Figure 4

The high points of participation indicate the age at which that birth year was most active in the work force. This indicates that the lowest number of people were in school (therefore not participating in the labor market) or taking time off work for family reasons. Therefore, it can be concluded that the high points indicate times in which that birth year are not having children. Figure 4 details this over time. As the graph shows, this maximum participation rate is moving to younger and younger ages. People born in the late 1950s' participation was around 40-43, however people born ten years later have peak participation around 32-34. This trend continues, though with lower participation rates. For all subsequent birth year cohorts, the participation peak happens between their late twenties and early thirties.

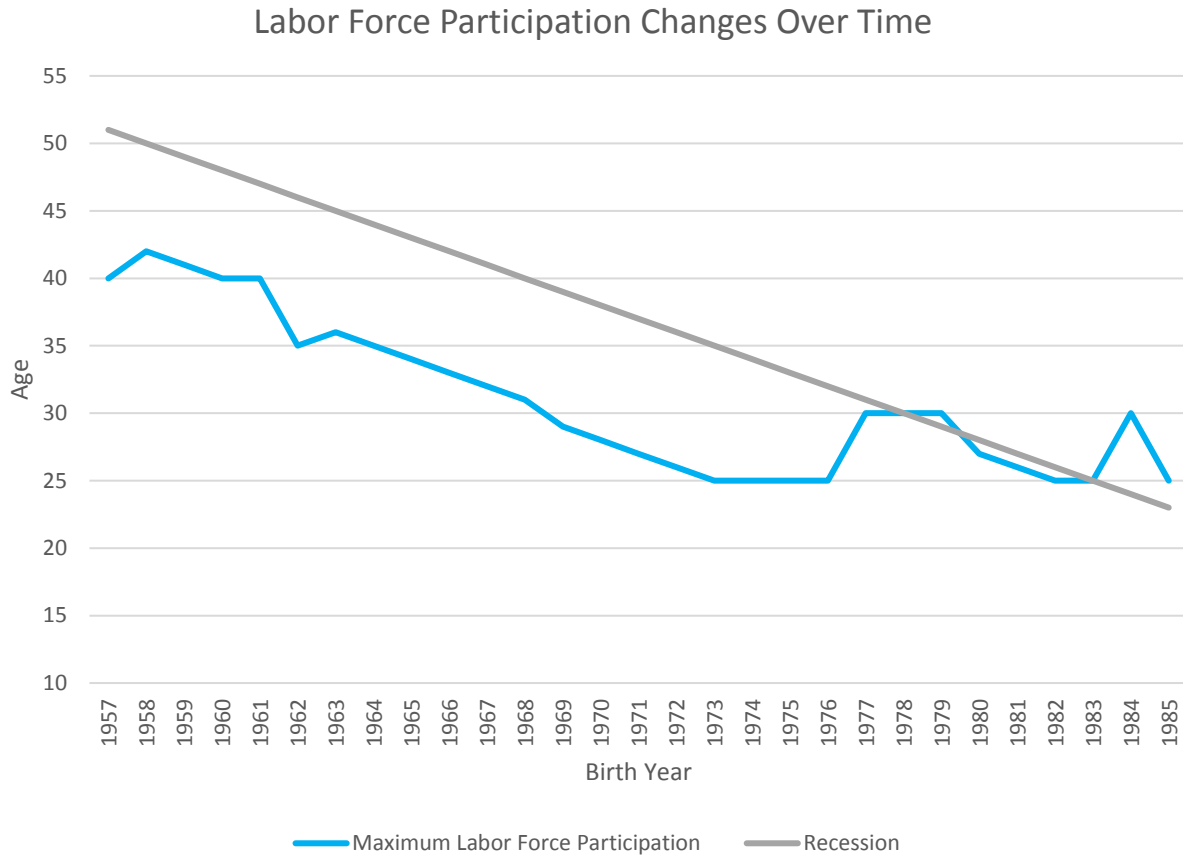


Figure 5

Figure 5 visualizes this data in a simpler way, showing just the peak participation rates. The age of maximum participation is consistently getting smaller, until the cohort of people born in 1977. At this point, the economic recession of 2007 begins to interfere with the data, as shown with the gray line. This is likely because of people leaving the work force long term after losing their job, or returning to school to get higher paying jobs. It is difficult to project where this trend will continue once the effects of the recession are over, but the stagnation in maximum participation among people born in 1973-1976 suggests that this peak of participation at 25 may continue as a new normal.

## Data Analysis

### Current Trends

As the research examines the trends in MBA data it is useful to compare to the CEO data. In figure 6, the percentage of women graduating from MBA Programs is compared to the percentage of women holding CEO positions in the S&P 500. This graph was constructed by using the average of MBA graduates, 28, and the average age of CEOs, 56. Because these are just averages, the graph below only approximates the trends for comparative purposes. The graph shows that the CEO rate is closer to the top 20 trend, which is to be expected since CEOs are highly competitive and qualified people, as are the graduates of top programs.

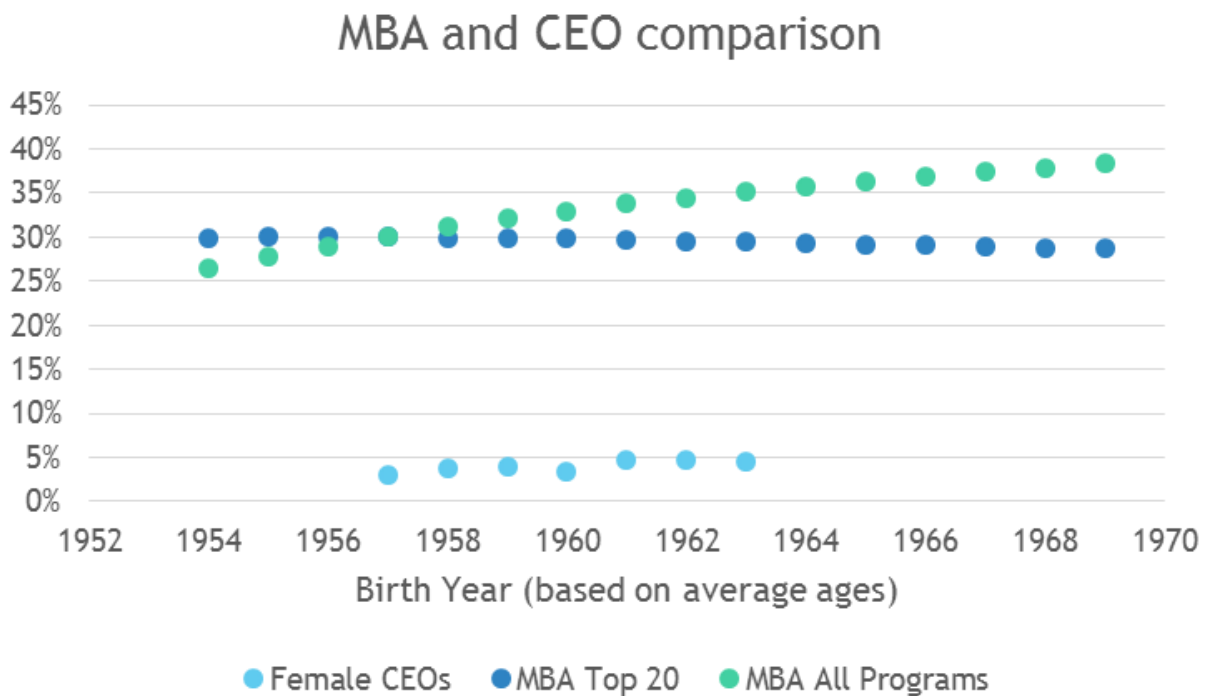


Figure 6 (U.S. Department of Education 2016, U.S. News 2016)

Since the percentage of females in CEO positions is clearly linked to the Top 20 programs it makes sense to predict future trends based on this regression, rather than the all program regression. As seen in Figure 7, the top 20 trend line has remained relatively constant, so it should not be expected that CEO growth is rapid. However, one major factor that has not been examined here, is the fact that

CEO turnover is not routine and will cause a lag time in the catching up between the two trends. One CEO may stay with the same company in the same position for over 20 years, and whenever the position is held long term that company will not be able to catch up with MBA trends. Because of this, even without any prejudices that exist in hiring or factors that prevent women from excelling at their jobs, firms would take time to catch up to trends in certifications.

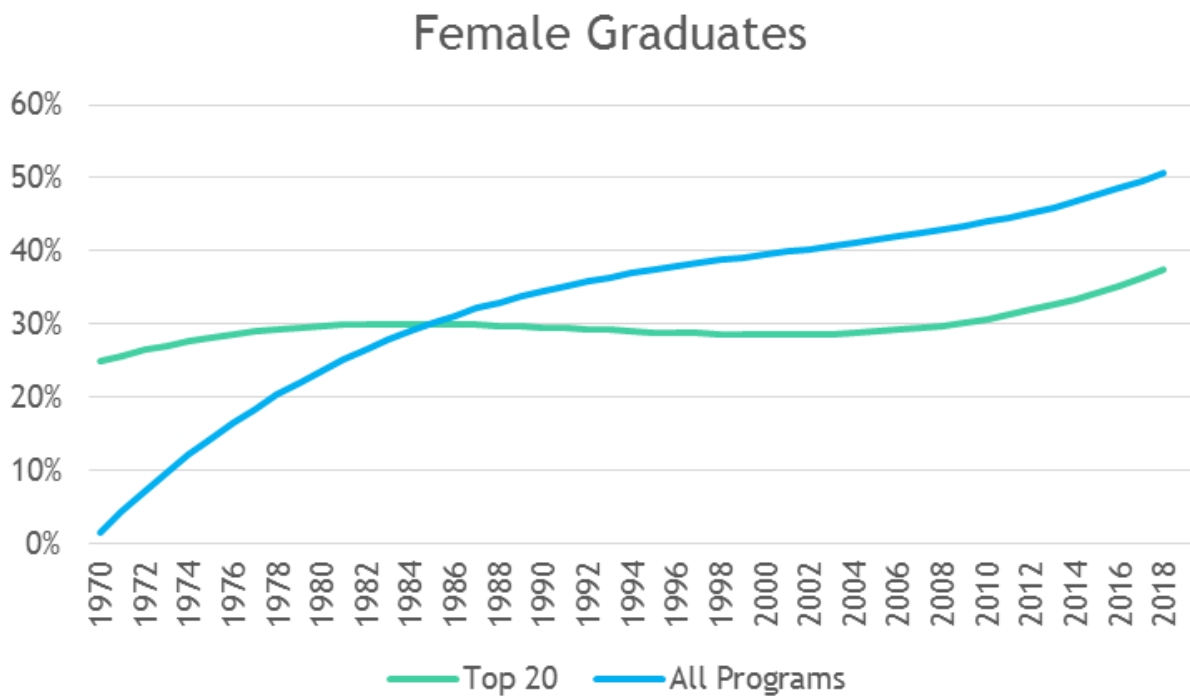


Figure 7 Source: (U.S. Department of Education 2016, U.S. News 2016)

The overall trend of labor force participation peaking in earlier years could have drastic effects on women's career paths. It could be either positive or negative for women looking to get to the top. On the one hand, women having children later could mean that they're missing out on years that are crucial for career success, where many managers make moves to upper level management. On the other, women may leave when they already have benefits with companies and are therefore leaving a position they can come back to in a couple months or a couple of years, and they may have already proven

themselves as a manager – therefore making it easier to get back onto the career ladder after taking time off.

## Conclusion

The MBA data constructed in this research clearly shows a positive trend for women in all MBA programs, but a mostly stagnated percentage in the Top 20 programs. This trend will cause stagnated growth for the percentage of female CEOs, once the cycles of companies choosing a new CEO is complete. The new data of the labor force participation changes could have major implications on the ability of women to climb to the top of the career ladder, but whether this effect will be positive or negative is unknown. Because women's qualifications are weighted more heavily in hiring decisions the effect of more women getting MBAs is likely to multiply the catch up of the CEO percentage to the MBA percentage. These trends and factors are likely to make a growing percentage of CEOs female.

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