

Are Leaders Born or Made?

Fortune 500 CEO Analysis
Comprehensive Report
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OVERVIEW

This report aims to uncover potential patterns among Fortune 500 CEOs by analyzing factors such as age, gender, education, birthplace, and career trajectory. It seeks to address fundamental questions about the nature of leadership: Are CEOs inherently predisposed to lead, or are their paths to leadership shaped by external forces? By examining the journeys of these CEOs, the report endeavors to extract actionable insights that individuals can leverage to advance their own careers toward executive leadership roles.

The analytical procedures for this report were executed primarily using SQL. Python was also utilized for supplementary analyses and data manipulation.

DATA SOURCES

The primary data source utilized in this analysis originates from Kaggle, encompassing a compilation of Fortune 1000 records. However, additional data collection was necessary, and due to time constraints, collection was limited to the subset of Fortune 500 records. Despite this limitation, the Fortune 500 subset was deemed sufficient for the analysis.

The Kaggle dataset incorporates key fields including CEO name, company name, sector, founder status, and CEO gender.

To facilitate comprehensive analysis, supplementary fields were gathered, encompassing the following:

ADDITIONAL COLUMNS				
DOB of CEO	Month & Day of DOB	Birth Year	Missing DOBs	City of Birth
Birth State	Home State	State of Residence	Bachelor's School	Bachelor's Major
Master's School	Master's Major	Has PhD	Dropped Out	Year Became CEO
Prior CEO Experience	2 nd Master's School	2 nd Master's Major	3 rd Master's School	3 rd Master's Major
Zodiac of CEO	CEO Age	Age Became CEO		

This information was manually gathered from online sources such as company websites and news articles.

Three data transformations were conducted. Dates of birth (DOBs) were utilized to generate a Zodiac column, the birth year was utilized to create an Age column, and the year of assuming the CEO role was employed to generate an Age Became CEO column.

Upon filtering the Fortune 1000 Kaggle dataset to the top 500, a few companies were found to have co-CEOs, whose names were jointly listed for their respective companies. To ensure all

CEOs were accounted for, the co-CEOs were separated into individual entries. Consequently, the final dataset comprises a total of 508 CEO records.

The Kaggle dataset link is provided in the References section at the conclusion of this report.

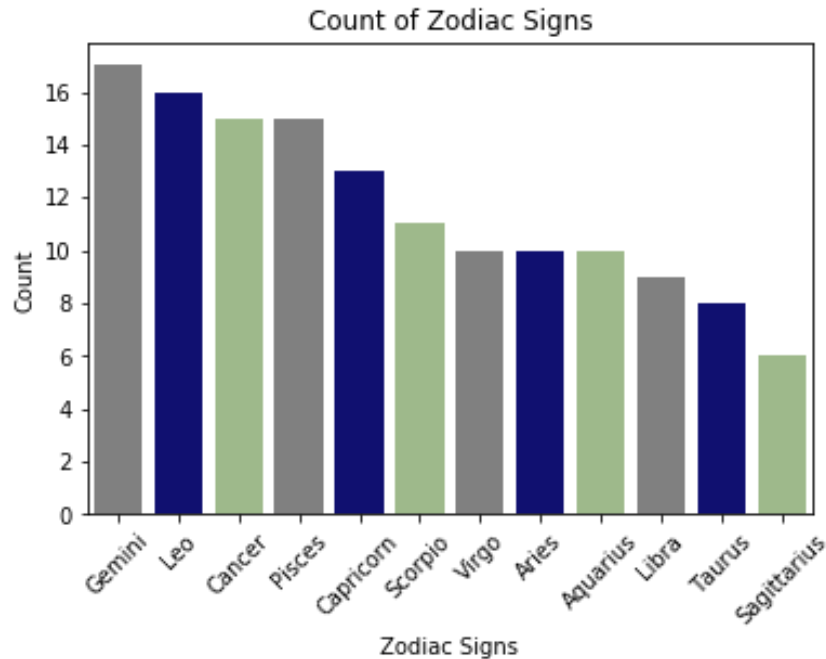
ZODIAC

In this section, the analysis is derived from a subset of the overall dataset, specifically focusing on 140 Date of Births (DOBs) that were successfully collected for examination. The larger dataset comprises a total of 508 rows, and while the complete DOB information is not available for every entry, the analysis is conducted on the available 140 DOBs. These data points, though representing approximately 28% of the total dataset, offer valuable insights into the distribution of zodiac signs. The 12 zodiac signs are categorized based on their respective date ranges, as outlined in the table below:

Zodiac	Date Range
Aries	March 21 - April 19
Taurus	April 20 - May 20
Gemini	May 21 - June 20
Cancer	June 21 - July 22
Leo	July 23 - August 22
Virgo	August 23 - September 22
Libra	September 23 - October 22
Scorpio	October 23 - November 21
Sagittarius	November - December 21
Capricorn	December 22 - January 19
Aquarius	January 20 - February 18
Pisces	February 19 - March 20

Despite being a subset, the 140 available DOBs offer sufficient insights into the distribution of zodiac signs within the analyzed portion of the dataset. It is important to note that, due to the limited sample size, the findings may not fully represent the entire population. For a more comprehensive understanding, further data collection is needed.

How are zodiac signs distributed, and which ones are the most prevalent? Is there a discernible pattern in their occurrence?



Findings:

The distribution of zodiac signs exhibits a notable uniformity across the zodiac categories. Among Fortune 500 CEOs, the predominant zodiac signs are Gemini, Leo, and Pisces, with Pisces sharing a position with Cancer.

Analysis:

Given the minimal divergence in zodiac counts, it can be inferred that a proportional representation of zodiac signs exists within the Fortune 500. To draw more conclusive insights, a more extensive collection of birthdates would be beneficial, allowing for a comprehensive assessment of whether these findings are applicable to the entire spectrum of Fortune 500 CEOs or if outcomes would vary with increased data.

Do the zodiac signs commonly associated with natural-born leaders (Aries, Leo, and Capricorn) constitute the majority of CEOs? Do any of these signs rank within the top three?

Findings:

Leo stands as the sole zodiac sign within the top three, with Capricorn securing the 5th position and Aries placing 8th. Notably, the combination of these three zodiac signs does not represent the majority of CEOs.

Analysis:

Among the zodiac signs recognized as natural-born leaders, only Leo emerges within the top three. The combined presence of Capricorn, Aries, and Leo does not form the majority of CEOs. Therefore, making definitive claims about an increased likelihood of individuals with these leadership-associated zodiacs attaining CEO roles is not supported. Further data collection

would be required to ascertain whether Leos consistently occupy top positions, as the observed pattern in this subset may be coincidental.

Is there variation in zodiac signs based on industry?

Findings:

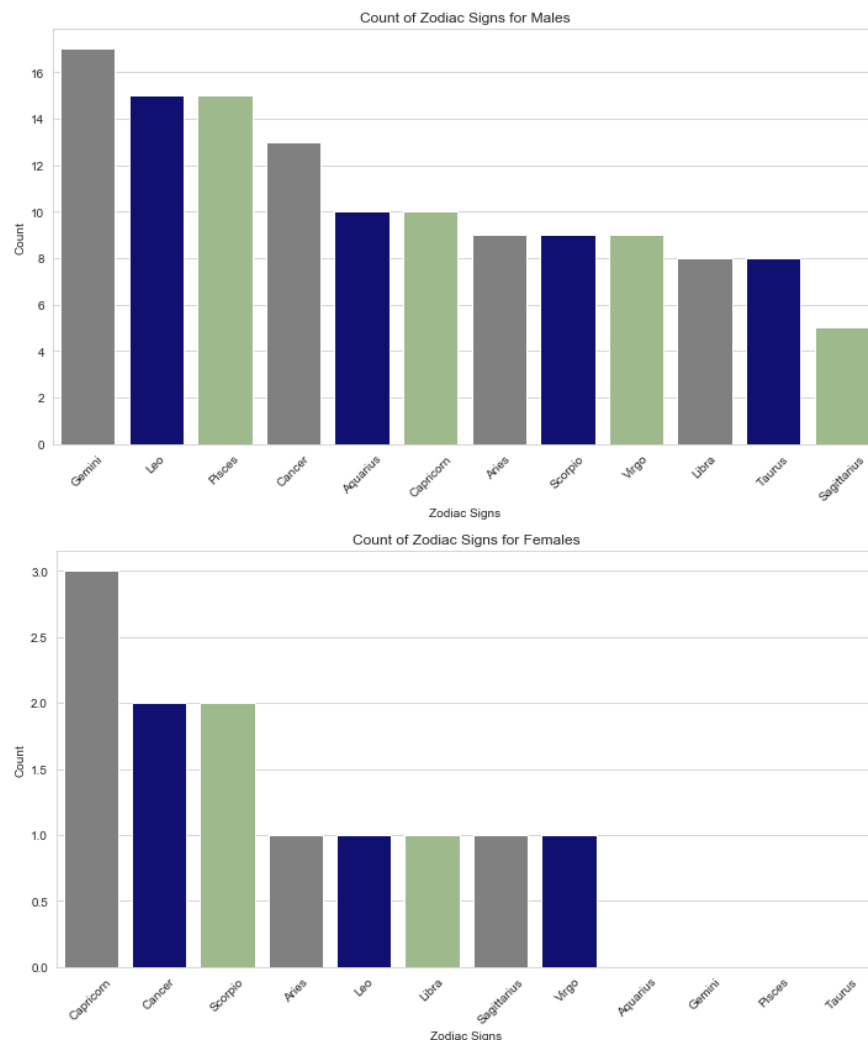
When categorized by zodiac signs, no significant patterns or findings emerged. Each zodiac sign was distributed across multiple industries, with similar and insignificant counts.

Analysis:

The data leads to the conclusion that a leader's zodiac sign does not serve as a determining factor in the industry they ultimately choose.

Do zodiac signs vary by gender?

Below are charts displaying the differences in zodiac signs for male vs female CEOs:



Findings:

For male CEOs, the top three zodiacs are Gemini followed by Pisces and Leo, with Pisces and Leo tied.

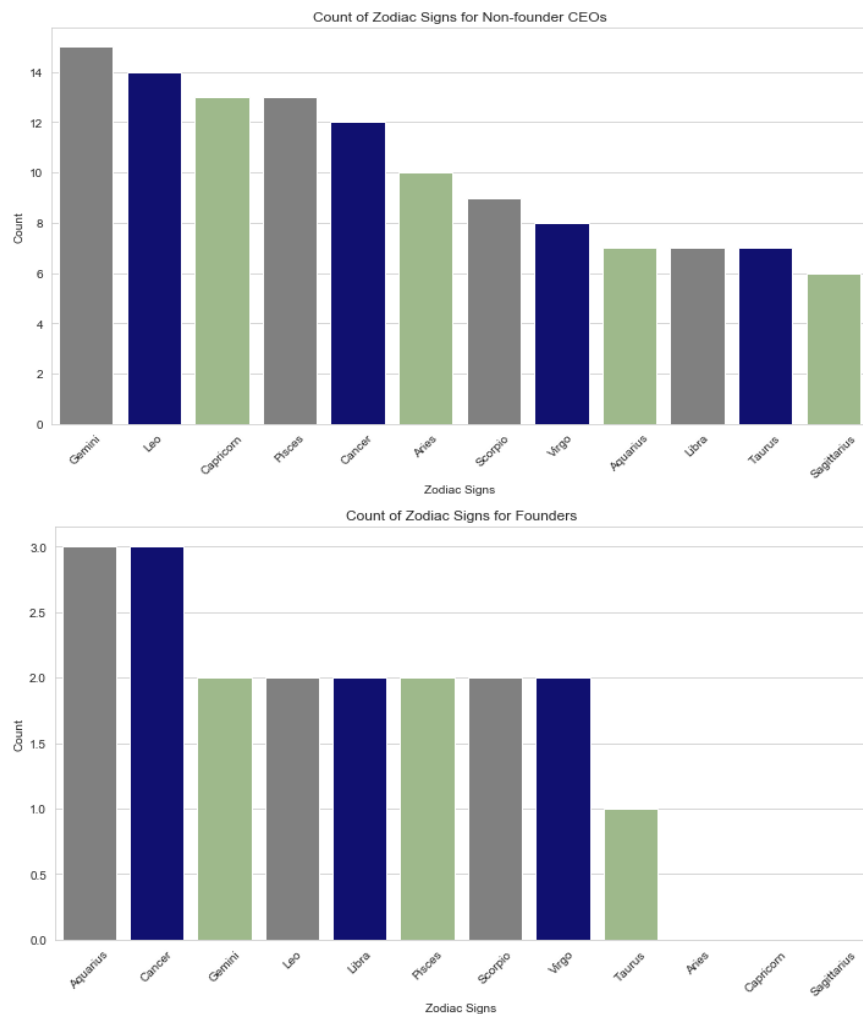
For female CEOs, the top three zodiacs are Capricorn followed by Cancer and Scorpio.

Analysis:

Similar to the findings above, there isn't a significant enough difference in zodiac counts for either gender to draw any substantive conclusions. However, it's noteworthy that the top three zodiacs differ between male and female CEOs. To ascertain the consistency of this pattern, especially for female CEOs, additional data would be necessary.

Are there distinctions in zodiac signs between founders and other CEOs? What zodiac signs are prevalent among founders, and are there discernible patterns?

Below are charts of zodiac signs for founder vs non-founder CEOs:



Findings:

Zodiac data was obtained for 19 out of the 24 founders, comprising a subset within the dataset of 508 CEOs listed on the Fortune 500.

When compared to the top three zodiacs from the overall distribution (Gemini, Leo, Pisces, and Cancer tied), the primary zodiacs for founders are Aquarius and Cancer.

When assessed against assumed natural-born leader signs (Aries, Leo, Capricorn), only Leos were identified among the list of founders.

When contrasted with the leading signs for male CEOs (Gemini, Pisces, Leo), all three are present among founders. No comparison could be made against female CEOs, as there are no female founders.

Analysis:

A distinction is observed in the top zodiacs for founders when compared to other CEOs, particularly with the prominence of Aquarius and Cancer. However, it's noteworthy that the top three zodiacs from the overall distribution are also found among founders. In terms of natural-born signs, once again, only Leos appear on the founders list. Overall, there isn't a significant difference in counts to draw conclusive findings. The counts among zodiacs are comparable. Additional data collection would be essential to determine if founders tend to be Aquarians and Cancers, and further investigation would be needed to confirm if Aquarians or Cancers exhibit a tendency to become entrepreneurs.

Summary of Zodiac Findings

Due to limited data, the generalization of zodiac findings to all 508 CEOs on the list cannot be made with confidence. Further data collection is needed. If subsequent findings align with the observed patterns, it suggests that any zodiac may be associated with CEO positions, emphasizing that zodiac characteristics alone may not be determinative factors in professional growth.

Based on the observed patterns, it is concluded that leaders may not be inherently born, as zodiac characteristics alone do not appear to be definitive factors in professional growth, nor does it strongly support the idea that they are entirely made through external factors. This nuanced understanding invites further exploration and consideration of additional factors that contribute to leadership development.

EDUCATION

What are the top schools the CEOs on the Fortune 500 attended for their Bachelors?

Out of the 508 CEOs listed, records were gathered for 480 CEOs regarding their undergraduate alma maters. This data includes instances where CEOs attended the university but may not have graduated, encompassing both graduates and individuals who dropped out. A total of 280 unique undergraduate universities were identified. Notably, a tie among 10 schools occurred for the 18th, 19th, and 20th positions in the top 20 ranking used for the analysis. To address this tie within the context of the analysis, the three most prestigious universities—Notre Dame, University of Michigan Ann Arbor, and Princeton—were selected. The criterion of prestige guided the selection process, aligning with the focus of the analysis on prestigious institutions.

Following is the ranking of the top 20 undergraduate schools attended by CEOs within the Fortune 500.

Rank	Undergraduate Schools Attended
1	UPenn
2 (tie)	Harvard
2 (tie)	Cornell
3 (tie)	Purdue
3 (tie)	Iowa State
4 (tie)	Stanford
4 (tie)	Boston College
4 (tie)	Georgetown University
4 (tie)	Texas A&M
5 (tie)	Miami University
6 (tie)	United States Military Academy
6 (tie)	University of Virginia
6 (tie)	Brown
6 (tie)	University of Wisconsin-Madison
6 (tie)	University of Texas, Austin
6 (tie)	Georgia Tech
6 (tie)	Dartmouth
7 (tie)	Notre Dame
7 (tie)	University of Michigan Ann Arbor
7 (tie)	Princeton

Findings:

- **Ivy League Presence:**
 - 45 CEOs, constituting 9% of the total, attended Ivy League undergraduate schools. Among the top 20 schools, 41 CEOs had Ivy League backgrounds, with the University of Pennsylvania having the highest representation.

- Six Ivy League schools, including UPenn, Harvard, Cornell, Brown, Dartmouth, and Princeton, made it to the top 20. Columbia and Yale, although Ivy League, ranked 38th and 151st, respectively, out of 280 schools.
- **Other Highly Regarded Universities:**
 - Six additional esteemed universities—Stanford, Georgetown, University of Virginia, University of Texas Austin, University of Michigan Ann Arbor, and Notre Dame—were also featured in the top 20. A total of 25 CEOs attended these institutions.
- **Prestigious Universities in the Top 20:**
 - Out of the 129 CEOs who attended the top 20 undergraduate universities, 66 CEOs (51%) came from highly esteemed universities within that top 20.
 - This contrasts with the remaining 63 CEOs (49%) who attended schools in the top 20 that are not regarded as prestigious.
 - Among the top 20 schools, 12 are considered prestigious, while 8 are not considered prestigious.
 - Out of the 480 total records, 129 CEOs attended the top 20 universities, accounting for 27% of the total. In contrast, 351 CEOs attended universities outside of the top 20, representing a larger proportion of CEOs and constituting 73% of the total.

Further exploration could have included an analysis of all potentially prestigious or highly regarded universities, amounting to a total of 63, which includes both hidden Ivies and little Ivies. However, due to the subjective nature and the lack of official rankings for such institutions, this analysis did not incorporate them. The potential for future analysis remains, offering an opportunity for more refined conclusions.

Analysis:

- **Ivy League Presence:**
 - A mere 9% of CEOs (45 out of 508) pursued their undergraduate education at Ivy League institutions. With a robust dataset of 480 records out of 508, it becomes apparent that leadership does not inherently stem from Ivy League backgrounds, challenging the notion that attending these schools is a prerequisite for guaranteed leadership growth.
- **Prestigious Universities in the Top 20:**
 - Around one-quarter of CEOs (27%) found their academic roots in the Top 20 institutions, while the majority, constituting three-quarters (73%), attended universities outside of the Top 20. The findings suggest that while rankings offer insights into CEO undergraduate school attendance counts, it does not correlate with a higher likelihood of CEOs attending the top 20 schools over non-top 20 schools.
 - In examining CEO Top 20 attendance, whether at esteemed or not esteemed universities, it becomes evident that an almost equal distribution exists – 51% of CEOs attended highly esteemed universities within the top 20, while 49% attended universities not considered prestigious. Despite the presence of more

prestigious schools (12 out of 20) within the top 20, the proportional distribution of CEO attendance remains fairly balanced.

Both Ivy League and Top 20 results fail to support the idea that attending highly esteemed universities or those with higher CEO attendance provides a distinct advantage in achieving CEO positions based on undergraduate education. Exploring CEO attendance at all 63 ivy-equivalent schools could unveil valuable patterns for further analysis.

What are the top schools the CEOs on this list received their Masters from?

A total of 130 graduate schools were attended by Fortune 500 CEOs, with data covering 359 instances of master's degree attendance. This includes first, second, and third master's degrees. The breakdown consists of 306 records for the first master's, 52 for the second master's, and 1 for the third master's. Since there was only 1 record for a third master's, it was excluded from the analysis.

The analysis, unlike undergraduate data, represents the total occurrences of schools attended rather than unique CEOs. The data for first Masters and second Masters was consolidated, combining the respective fields in the dataset.

Analogous to the approach used for gathering information on bachelor's degree schools, this analysis is centered on school attendance rather than degree completion. The data, collected with a focus on attendance, includes instances of CEOs who dropped out. Only one CEO dropped out of their master's program.

To ensure methodological consistency with the Bachelor's data, the top 20 schools were selected for analysis in the Master's data as well. There were 208 records documenting CEOs who attended the top 20 graduate schools, with an additional 150 records for CEOs who attended schools outside of this top tier. This results in 58% of records falling within the top 20 and 42% outside of it. Despite there being fewer schools in the Master's list compared to the Bachelor's list, there are more Master's records within the top 20, indicating a higher concentration of records in the Master's Top 20.

To resolve a 12-way tie for the 18th, 19th, and 20th spots in the Master's Top 20, the three most prestigious schools among the twelve were selected: University of Virginia, University of California Berkeley, and Texas A&M, aligning with the focus on prestige. The University of Michigan was specifically excluded due to an unspecified location.

Following is the ranking of the top 20 graduate schools attended by CEOs within the Fortune 500.

Rank	Graduate Schools Attended
1	Harvard
2	Northwestern
3	Stanford
4	UPenn
5	Columbia
6	University of Chicago
7 (tie)	Arizona State University
7 (tie)	MIT
7 (tie)	NYU
8 (tie)	University of Texas, Austin
8 (tie)	University of Wisconsin-Madison
8 (tie)	UCLA
9 (tie)	University of Michigan Ann Arbor
9 (tie)	Dartmouth
9 (tie)	University of Illinois, Urbana-Champaign
9 (tie)	Rutgers
9 (tie)	Boston University
10 (tie)	University of Virginia
10 (tie)	University of California Berkeley
10 (tie)	Texas A&M

Findings:

- **Ivy League Presence:**
 - Four Ivy League institutions—Harvard, UPenn, Columbia, and Dartmouth—secured positions in the top 20. Meanwhile, the remaining Ivy League schools (Cornell, Princeton, Yale, and Brown) held rankings of 74th, 114th, and 130th (last) respectively, with Brown notably absent from the list.
 - In total, there are 91 records of Ivy League attendance among Fortune 500 CEOs in master's programs, accounting for 25% of the total records. Harvard, an Ivy League school, takes the lead with nearly double the count of the second-place school, Northwestern, which is highly regarded but not part of the Ivy League.
- **Prestigious Universities in Top 20:**
 - There are 83 records of Ivy League schools in the top 20, making up 40% of records in the top 20 schools.
 - Among the top 20 schools, 15 are considered highly esteemed. These include Harvard, UPenn, Columbia, Northwestern, Stanford, University of Chicago, MIT, NYU, UCLA, University of Texas Austin, University of Michigan Ann Arbor, Dartmouth, University of Virginia, University of California Berkeley, and Texas A&M. These schools account for 181 records or 87% of records in the top 20.
 - Harvard, Northwestern, Stanford, UPenn, Columbia, and the University of Chicago are the schools with the most master's records for Fortune 500 CEOs,

making up 143 records or 69% of the top 20. Three are Ivy League schools, and three are highly regarded and considered Ivy-equivalents.

Analysis:

Comparing the graduate school records and analysis to the previous undergraduate findings, the emphasis on the top 20 graduate schools gains additional credibility. The undergraduate analysis, based on 129 records in the top 20, contrasts with the graduate analysis, which relies on 208 records within the top 20 – a notable increase of 79 records. Despite the Bachelor's list having a wider variation of schools, 27% of undergraduate records fall within the top 20, while 58% of graduate records fall within the top 20.

In a similar vein, 51% of undergraduate records indicate CEOs attending highly esteemed universities in the top 20, while 87% of graduate records show the same trend. This signifies a notable increase in highly esteemed university attendance for CEOs in their Master's programs compared to their Bachelor's programs.

Turning to Ivy League attendance, 9% of all undergraduate records exhibit CEOs attending Ivy League schools, while 25% of all master's records exhibit CEOs attending Ivy League schools. Ivy League schools accounted for 32% of the undergraduate top 20 schools and 40% for graduate top 20 schools. All of this signifies a higher Ivy League attendance for CEOs in their Master's programs compared to their Bachelor's programs.

Analyzing the school variations in both Top 20 lists, with a focus on Ivy League institutions, six Ivy League schools were featured in the Bachelor's top 20 and all eight Ivy League schools were attended. In the Master's top 20, four Ivy League schools were present and three other Ivy League schools were attended. Notably, Brown University did not make the list, indicating no Master's program attendance at Brown. Additionally, Harvard, UPenn, and Dartmouth secured positions in both top 20 lists, while Columbia did not appear in the Bachelor's top 20 but did make the Master's top 20.

When examining schools with the highest number of Master's records, they constitute a significant portion of the master's top 20 (69%) and are universally esteemed institutions. It could be argued that attending Harvard, Northwestern, Stanford, UPenn, Columbia, or the University of Chicago might offer advantages in one's professional growth toward becoming a CEO. Harvard stands out with the highest CEO attendance in its Master's programs, followed by Northwestern and Stanford.

There is a more selective range of schools for Master's programs compared to Bachelor's programs. Attending one of the highly esteemed universities mentioned for Master's programs may be advantageous for one's growth toward becoming a CEO.

However, questions arise regarding the timing of CEOs' enrollment in Master's programs – whether it occurred early in their careers or after establishing themselves as leaders. Assessing

the direct impact of Master's school attendance on their growth, and identifying measurable indicators, becomes an avenue for deeper insight. Additionally, consideration should be given to other influencing factors, such as the networks formed during Master's programs and specific traits like lifelong learning, self-initiative, or curiosity that may have contributed to their success.

What are the top schools overall that the CEOs graduated from?

Data from both undergraduate and graduate programs were aggregated to determine the most frequently attended schools by Fortune 500 CEOs. Null and "No" entries were excluded.

Following is the ranking of the top 20 schools attended overall by CEOs within the Fortune 500.

Rank	Schools Attended Overall
1	Harvard
2	UPenn
3	Stanford
4	Northwestern
5	Columbia
6	University of Chicago
7 (tie)	Arizona State University
7 (tie)	University of Wisconsin-Madison
7 (tie)	Cornell
7 (tie)	Boston College
7 (tie)	University of Texas, Austin
7 (tie)	Texas A&M
7 (tie)	Purdue
8 (tie)	MIT
8 (tie)	NYU
9 (tie)	University of Michigan Ann Arbor
9 (tie)	University of Virginia
9 (tie)	Iowa State
9 (tie)	UCLA
9 (tie)	Georgetown University

Findings:

Harvard occupies the leading position, followed by UPenn, Stanford, Northwestern, Columbia, and University of Chicago, respectively. Thirteen out of the top 20 institutions are recognized as highly esteemed universities.

Analysis:

Broadly speaking, these findings provide insight into the schools with the highest CEO enrollments across all degree levels. Harvard and other prestigious universities emerged as the most frequently attended institutions.

What percentage of CEOs earned their Bachelor's?

This is calculated based on the CEOs who have successfully completed their Bachelor's degree. The calculation is derived from the Bachelor School data rather than the Bachelor Major data, as it contains more available records. There are 484 Bachelor School entries. After excluding dropouts and records marked 'no' for completing their undergraduate education, the final count stands at 471.

Findings:

Out of 508 Fortune 500 CEOs, 471 obtained their Bachelor's degrees, constituting 93% of all Fortune 500 CEOs. For this calculation, null and 'no' values were considered as 'degree not obtained' allowing for a broad comparison that includes all CEOs, regardless of available data.

Analysis:

This analysis suggests that acquiring a Bachelor's degree is a worthwhile educational investment for individuals aspiring to leadership roles, given that 93% of Fortune 500 CEOs have successfully obtained their Bachelor's degree. The shared characteristic of having a Bachelor's degree is evident among almost all of them.

What percentage of CEOs earned their Master's?

Similar to the calculation for Bachelors percentage, the calculation is based on CEOs who have successfully completed their Masters. The calculation is derived from the Master School data rather than Master Major data, as it contains more available records. There are 486 Master School entries. After excluding dropouts, the total comes to 477. The records marked 'no' for completing their graduate education were also excluded, bringing the final count to 305.

Findings:

Out of 508 Fortune 500 CEOs, 305 earned their Master's degrees, representing 60% of all Fortune 500 CEOs. For this calculation, null and 'no' values were considered as 'degree not obtained' allowing for a broad comparison that includes all CEOs, regardless of available data.

Analysis:

More than half of Fortune 500 CEOs have earned their Master's degrees. While there are fewer CEOs with Master's degrees compared to those with Bachelor's degrees (93%), a significant portion still holds Master's degrees. It can be argued that obtaining a Bachelor's degree may be more of a requirement, given that 93% of CEOs have one. However, there is still a strong case for pursuing a Master's degree for those aspiring to become future CEOs.

The completion of this analysis raises additional questions: Did the Master's degrees facilitate career changes and enhance upward mobility? Are these CEOs lifelong learners who pursued their Master's degrees for personal development, even if the degree itself had no direct impact on their career trajectory?

What percentage of CEOs earned a second Master's degree?

A total of 52 CEOs pursued and successfully completed a second Master's degree. There were no dropouts, and all null values were considered as 'degree not pursued'.

Findings:

Among all Fortune 500 CEOs, 10% obtained their second Master's degree.

Analysis:

A relatively small number of CEOs pursued a second Master's degree. It can be inferred that obtaining a second Master's is optional and not essential for achieving leadership roles within the Fortune 500. The significance of a second Master's degree may diminish after obtaining the first one.

What percentage of CEOs earned a third Master's degree?

Only one entry was recorded for the third Masters, and the data from the Third Masters records was utilized with no instances of dropouts.

Findings:

Only one CEO obtained a third Masters, constituting less than 1% of all Fortune 500 CEOs.

Analysis:

It is uncommon for CEOs to hold a third Masters, and it is not necessary to pursue one to become a CEO. Holding a third Masters provides no discernible advantage in the trajectory toward becoming a CEO.

What percentage of CEOs have earned a PhD?

Findings:

12 CEOs on the Fortune 500 earned their PhD, making up 2% of all Fortune 500 CEOs. Additionally, 5 CEOs, constituting 1% of Fortune 500 CEOs, hold MDs. Moreover, 32 Fortune 500 CEOs, accounting for 6% of all Fortune 500 CEOs, have received an honorary PhD for their societal, business, and industry impact. Notably, one CEO, Marc R. Benioff, is both a founder and an honorary PhD recipient.

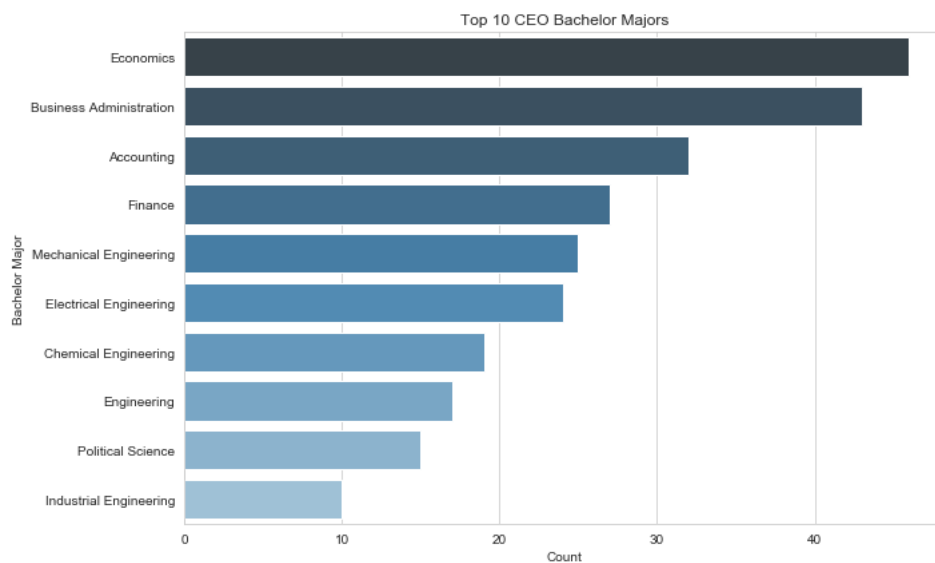
Analysis:

A majority of Fortune 500 CEOs conclude their education after obtaining a Masters. The data shows that only 2% of Fortune 500 CEOs possess a PhD, indicating that holding a PhD is not a prerequisite for reaching the CEO position and may not provide a significant advantage. Furthermore, there are more CEOs with a second Masters than those with a PhD. However, the number of CEOs holding a PhD exceeds those with a third Masters. This analysis suggests that pursuing a PhD may be more beneficial than obtaining a third Masters, and obtaining a second Masters may be more advantageous than earning a PhD if one aspires to be a CEO. Nevertheless, the data indicates that holding only a Masters is more prevalent, as the counts for second Masters, third Masters, and PhD are relatively insignificant. It's noteworthy that 32 Fortune 500 CEOs (6.3% of all Fortune 500 CEOs) have received an honorary PhD for their societal, business, and industry impact. While this discovery may not substantially influence the overall analysis, it is noteworthy. Particularly, the fact that only 6% of Fortune 500 CEOs have received honorary degrees and the recognition of Marc R. Benioff, the sole founder awarded an honorary PhD for his accomplishments, adds an interesting dimension.

What are the most common undergraduate majors among CEOs?

Data on undergraduate majors was available for 426 out of 508 CEOs. There are 105 unique undergraduate majors.

Below is a chart of the top 10 most common undergraduate majors among CEOs.



Findings:

The top 10 undergraduate majors among Fortune 500 CEOs include Economics, Business Administration, Accounting, Finance, Mechanical Engineering, Electrical Engineering, Chemical Engineering, Unspecified Engineering, Political Science, and Industrial Engineering, respectively.

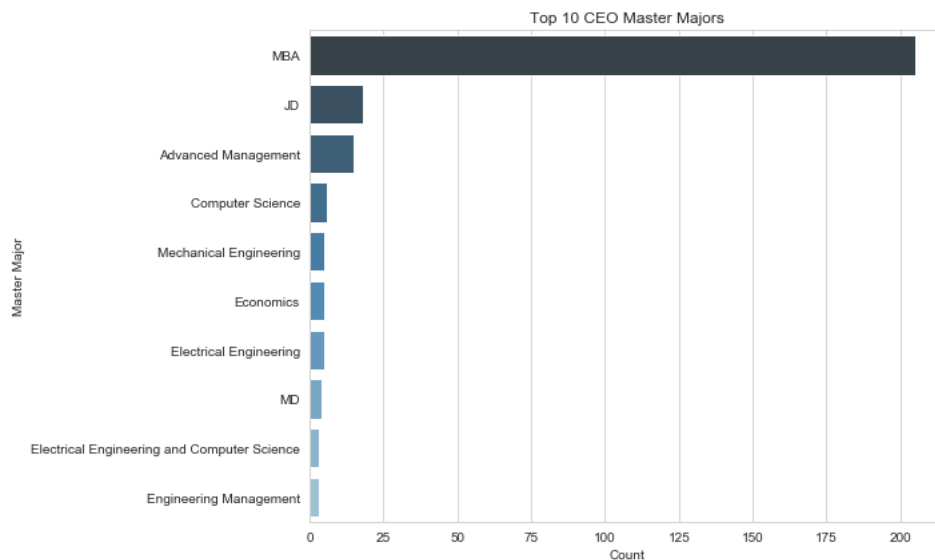
Analysis:

Engineering disciplines dominate, constituting 37% of the top 10. Additionally, it's noteworthy that all majors listed are quantitative in nature, except for Business Administration.

What are the most common graduate majors among CEOs?

Data on graduate majors was available for 484 out of 508 CEOs, encompassing 44 distinct graduate majors.

Below is a chart of the top 10 most common graduate majors among CEOs.



Findings:

The top 10 graduate majors among Fortune 500 CEOs consist of MBA, Advanced Management degrees, JD, Computer Science, Mechanical Engineering, Electrical Engineering, Economics, Engineering, MD, and Engineering Management, respectively.

Analysis:

The majority of Fortune 500 CEOs hold MBAs as their graduate degrees, representing 71% of the top 10. There appears to be a transition from technical to non-technical disciplines during graduate studies. However, Engineering degrees still feature prominently, indicating a continued interest in technical education among engineering leaders. Furthermore, the number of unique graduate majors is significantly lower compared to undergraduate majors, suggesting a more focused and intentional approach to graduate studies among executives. Also notable are the Advanced Management degree programs that many CEOs have pursued, demonstrating a management/leadership focus on their studies.

How many CEOs discontinued their college education, and how many of them are founders?

Findings:

Out of all Fortune 500 CEOs, a minimal number (less than 1%) abandoned their undergraduate studies, and one of them later received an honorary PhD. Additionally, one CEO dropped out of their Master's program. Among these individuals, five are founders. Considering the total of 24 founders, 21% of them have a history of dropping out.

Analysis:

The CEOs who opted to discontinue their education represent a negligible proportion of the total CEOs. Notably, around a quarter of founders discontinued their education, suggesting that the majority of founders successfully completed their undergraduate studies.

How many CEOs lack a college degree?

Findings:

Four CEOs within the Fortune 500 do not hold a college degree. Further details about these CEOs and their backgrounds are provided in the table below:

CEO	Company	Industry	Company Description	CEO Background
Jeffrey Musser	Expeditors Intl. of Washington	Transportation	Global logistics company	Started as a part-time messenger and progressed through roles such as District Manager, RVP of Sales & Operations, and CIO.
Arie Kotler	ARKO	Retailing	Fuel wholesaler, convenience store operator	Founded one of the companies that later merged with ARKO.
Randall T. Jones Sr.	Publix Super Markets	Food & Drug Stores	Supermarket chain	Began as a grocery bagger and moved up through roles such as store manager, district manager, and eventually President.

David W. Hult	Asbury Automotive Group	Retailing	Automotive retailer	Started as a retail sales associate within the industry and gradually advanced, eventually joining Asbury in 2014.
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Analysis:

Two of these individuals climbed the corporate ladder from entry-level positions within their respective companies, while one founded a company that later merged with the current organization. Another CEO began his career in an entry-level role within the industry before joining the current company.

Summary of Education Findings:

When examining the educational backgrounds of Fortune 500 CEOs to determine whether they are born or made, several key findings emerge. Regarding undergraduate education, a notable 93% obtained Bachelor's degrees, with the highest-ranking degrees primarily being in quantitative fields. This suggests that leaders are made through education, as they possess the technical expertise sought after by employers and leaders alike. In terms of graduate education, a significant majority (60%) pursued Master's degrees, with MBAs being prevalent. The prominence of MBAs suggests that they are highly valued by employers and can enhance leadership capabilities. Analysis of undergraduate institutions attended reveals a diversity of schools, with limited attendance at Ivy League institutions, implying that leadership is cultivated rather than innate. Conversely, graduate school attendance demonstrates a higher concentration at prestigious universities, indicating that advanced education may play a significant role in leadership development. Overall, these findings suggest that leaders are made through educational attainment and skill development rather than being inherently born as leaders.

ORIGIN

A total of 251 CEO birth states were documented, encompassing 73 unique states. For CEOs with international origins, their countries of birth were recorded as states.

Similarly, 304 CEO home states (states of origin) were documented, encompassing 66 unique states. The home state refers to the state in which the CEOs were raised or grew up. For CEOs with international roots, their countries of origin were treated as states.

Additionally, 328 CEO current residence states were documented, encompassing 37 unique states. For CEOs residing abroad, their countries of residence were treated as states.

These figures serve as the foundation for the analysis in this section.

Which regions of the country are home to the highest number of CEOs? This analysis considers birthplace, state of origin, and current residence.

Findings:

The top birthplaces for Fortune 500 CEOs include New York, California, Ohio, Pennsylvania, and India.

New York, Pennsylvania, Texas, Ohio, Michigan, and California emerge as the leading home states of Fortune 500 CEOs.

Leading states for the current residence of Fortune 500 CEOs include California, Texas, New York, Illinois, and Ohio.

Analysis:

The states that boast the highest number of CEOs are often home to numerous corporate headquarters. Notably, New York, California, and Ohio appear consistently across all three categories. It is also interesting to observe India among the top countries of origin for CEOs.

How many CEOs moved from their birth state or home state? How many currently reside and work in their birth or home state?

Findings:

75% of CEOs relocated from their birth state, while 64% relocated from their home state.

Analysis:

It's worth noting that most CEOs have departed from their birth states. However, being born in a particular state doesn't necessarily mean they were raised there, and where they grew up was likely not a matter of choice given their young age. Based on the collected data, 64% of CEOs have relocated from their home state, where they likely had more agency in deciding whether to stay or leave. This raises questions about whether their relocations were career-driven, post-college decisions, or driven by personal factors unrelated to their careers. The critical inquiry is whether relocation positively impacted their careers. While this data alone may not offer definitive answers, it prompts consideration. Nonetheless, it does indicate that the majority of CEOs did, indeed, relocate from their home states.

How many CEOs hail from countries outside the US? Which countries are they from?

The countries with the highest representation of non-US born CEOs were India, the United Kingdom, Canada, Germany, and Brazil.

Findings:

According to the collected data, 86 Fortune 500 CEOs were born outside the US.

Analysis:

Roughly a third of CEOs trace their origins beyond US borders, indicating a significant presence of expatriates. This trend underscores the ability of individuals from diverse backgrounds to relocate to the US, pursue opportunities, and realize the proverbial American Dream.

Summary of Origin Findings:

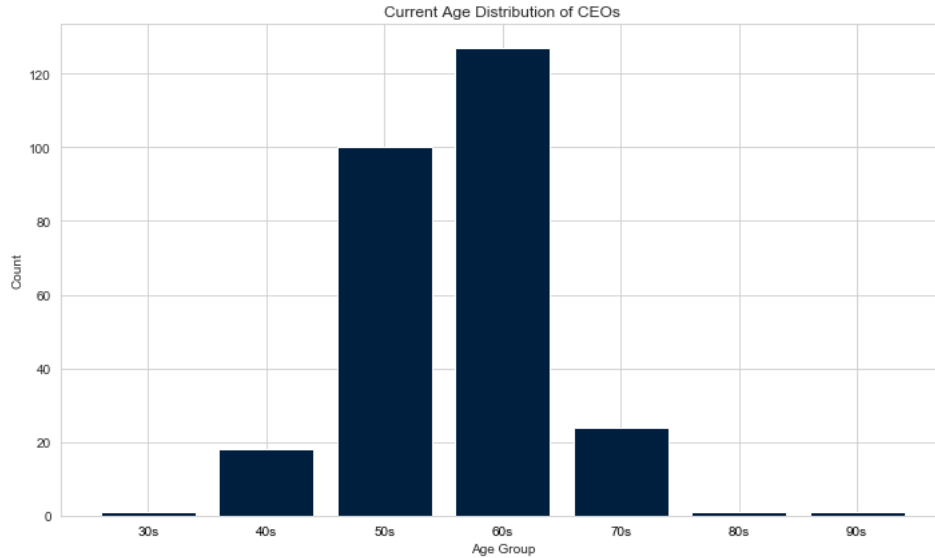
In assessing whether leaders are innately predisposed or developed through experiences, a notable discovery is that 64% of CEOs have relocated from their home state, and a considerable proportion originates from outside the US. This suggests a readiness among CEOs to embrace change, potentially unlocking opportunities otherwise inaccessible. However, attributing leadership solely to inherent qualities is challenging given the ambiguous motivations behind these relocations. It remains unclear whether CEOs relocated due to personal ambition, external circumstances, or a combination of both. Moreover, this relocation trend may extend beyond the CEO demographic. A comparative analysis with a non-CEO sample could offer valuable insights into relocation patterns. Based on the findings presented, it appears that leadership is neither solely innate nor entirely acquired.

AGE

In this section, data on CEO ages was compiled from 272 records. Dates of birth (DOB) were collected and transformed into age data for analysis. Additionally, two new fields were created: one to indicate the current age of CEOs and another to specify the age at which they assumed the CEO position. These data points serve as the basis for the subsequent analysis in this section.

What is the current age distribution of CEOs?

Below is a chart of CEOs' current ages:



Findings:

The majority of CEOs on the Fortune 500 are in their 50s and 60s. There are very few CEOs in their 30s, 80s, or 90s.

Analysis:

This demonstrates a natural progression of gaining leadership over time, attaining the CEO spot, and eventually retiring later in life.

How many CEOs are under the age of 40? Are they founders or have they ascended through the ranks?

Findings:

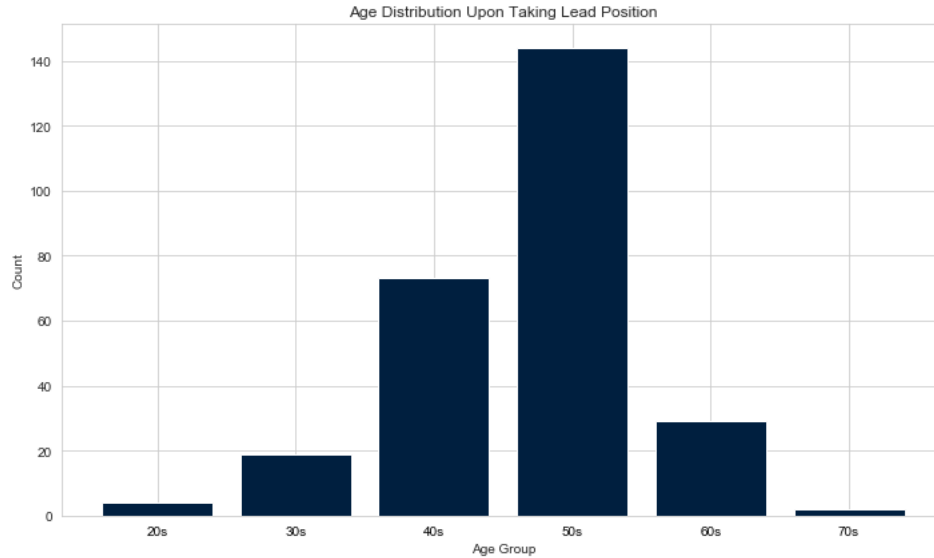
Among Fortune 500 CEOs, there are four individuals under the age of 40, all of whom are founders. These CEOs include Mark Zuckerberg of Meta, Brian Armstrong of Coinbase Global, Ernest C. Garcia III of Carvana, and Eric Wu of Opendoor Technologies.

Analysis:

The common thread among CEOs under 40 is their status as founders. They assumed the CEO role in their 20s or 30s.

What is the age distribution of CEOs upon taking the lead position?

Below is a chart of CEO ages upon taking the lead position:



Findings:

53% of CEOs assumed their role as CEO in their 50s, while 27% took the helm in their 40s, and 11% did so in their 60s.

Five CEOs took on their roles as CEOs during their teenage or early adult years. All of them are founders.

Analysis:

A significant portion of CEOs attained their position in their 50s, possibly indicative of accumulated experience and career advancement by that stage. This suggests that achieving top positions can be a gradual process, achievable later in one's career. If a professional hasn't reached their desired career milestones yet, there's still ample time for growth and advancement. Another notable aspect is that the CEOs who assumed the CEO position in their early adult years are founders.

How many CEOs assumed the CEO role before turning 40?

Findings:

Among the CEOs studied, 30 took on the CEO position before reaching the age of 40. Out of these, 16 were founders, while 14 were not. Considering there are a total of 24 founders, this implies that 67% of founders became CEOs before the age of 40.

Analysis:

CEOs who rose to the position before turning 40 constitute 11% of the CEOs for whom age records were available. Notably, the majority of founders achieved CEO status before reaching 40, suggesting they were youthful entrepreneurs with successful ventures.

What are the ages of newly appointed CEOs?

Findings:

The ages of incoming CEOs span from 40 to 78 years old.

Analysis:

This aligns with the earlier observations, indicating that CEOs are assuming positions within the Fortune 500 at later stages in their careers.

Summary of Age Findings:

Reflecting on the data presented in this section offers insights into the debate over whether leaders are born or made. Several key statistics emerge. The evidence indicates that CEOs typically ascend to their positions later in their careers and lives, suggesting a trajectory of gradual progression and accumulated experience culminating in leadership roles during mid-life. Notably, the prevalence of young CEOs is rare unless they are founders, who tend to assume leadership roles at a relatively young age. While the origins of founder success remain inconclusive, the data regarding non-founder CEOs suggests a trend toward leadership being cultivated over time, supporting the notion that leaders are made rather than born.

GENDER

How many female CEOs are represented in the Fortune 500?

Findings:

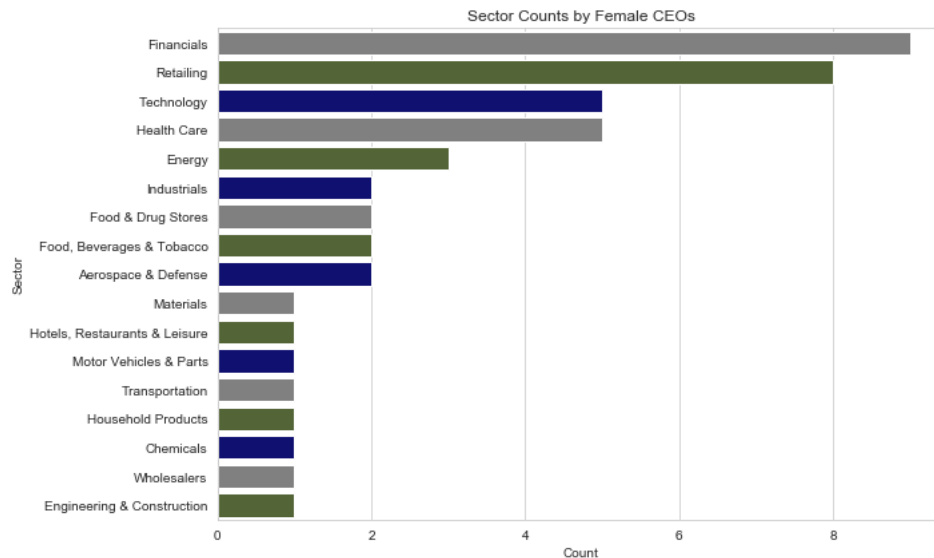
Out of the 508 Fortune 500 CEOs, 46 are female (9%).

Analysis:

The relatively low number of female CEOs highlights the prevalent gender disparity, with men holding a significant majority of Fortune 500 CEO positions.

Exploring the reasons behind the limited representation of female CEOs in the Fortune 500 could offer valuable insights. Key considerations include whether women actively choose not to pursue CEO positions or if systemic obstacles, often referred to as the "glass ceiling," create challenges for more women to attain CEO roles. Investigating whether women opt not to pursue these positions and understanding the reasons behind their decisions, as well as identifying potential barriers hindering more women from reaching CEO positions, could contribute to a deeper understanding of this complex issue. While these questions may have nuanced answers beyond the scope of this analysis, they remain intriguing points for consideration.

In which industries do female leaders predominantly operate in?



Female CEOs are most prominently represented in the Financials, Retailing, Health Care, and Technology industries. Notably, there is no female leadership present in the Apparel, Telecommunications, and Media sectors.

**Do certain industries exhibit a higher representation of female leaders compared to others?
Are there any industries where the number of female leaders surpasses that of males?**

None of the industries show a higher proportion of female leaders compared to male leaders. However, certain industries do exhibit a relatively higher percentage of female CEOs, as outlined below:

Industry	Percent of Female CEOs
Food & Drug Stores	40%
Aerospace & Defense	25%
Retailing	16%
Health Care	12%
Industrials	12%
Hotels, Restaurants & Leisure	11%
Technology	10%
Motor Vehicles & Parts	9%
Household Products	9%
Financials	9%
Food, Beverages & Tobacco	8%
Transportation	6%
Engineering & Construction	6%
Chemicals	6%
Energy	5%
Materials	5%

Wholesalers	5%
Apparel	0%
Business Services	0%
Media	0%
Telecommunications	0%

Analysis:

The Food & Drug Stores industry appears to have a more favorable landscape for female CEOs.

Are there any female founders among Fortune 500 CEOs?

Findings:

There are no female founders listed on the Fortune 500.

Analysis:

While the data alone may not provide conclusive answers as to why this is, intriguing questions emerge. Is it possible that some women sacrificed their careers or ideas for family responsibilities? Does the absence of female founders imply a disparity in entrepreneurial opportunities, or could it be influenced by gender dynamics in the business world?

How many female newcomers are there among Fortune 500 CEOs?

Findings:

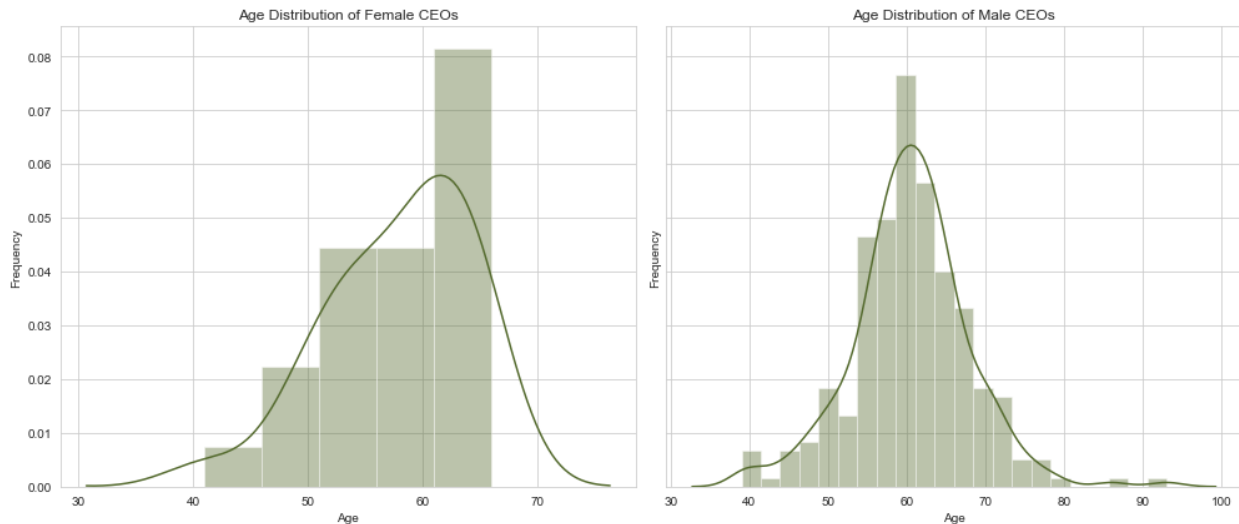
There is only one female newcomer, while there are 29 male newcomers.

Analysis:

The data highlights a notable gender disparity, with a considerable number of men outnumbering women in the journey to becoming CEOs.

How do the ages of female CEOs compare to those of male CEOs?

Below are the age distributions for male vs female CEOs:



Findings:

Female CEOs tend to be in their 50s and 60s, aligning closely with the age demographics observed among male CEOs. Female CEOs range in age from 41 to 66. In comparison, male CEOs span from 39 to 93, with the majority falling between their 40s and 70s.

Analysis:

The age distributions of male and female CEOs show considerable overlap, suggesting that both genders progress in their careers at similar rates in terms of age.

What age do CEOs typically reach their positions, and are there differences between genders?

Findings:

The majority of both female and male CEOs assume their roles in their 40s or 50s, with a significant portion reaching CEO status in their 50s.

Analysis:

The data indicates that male and female CEOs tend to attain their positions at similar ages, with a notable concentration in their 50s. This suggests that age is not a limiting factor in CEO appointments. Moreover, the prevalence of CEOs assuming their roles later in life underscores the value of accumulated leadership experience over time.

Summary of Gender Findings:

The absence of female founders, the low representation of female CEOs in the Fortune 500, and the continued male dominance in new Fortune 500 entrants are noteworthy. However, these statistics do not imply that men inherently make better leaders than women. Therefore, it's inaccurate to assert that leadership is predetermined by gender. Additionally, the age at which both men and women assume the CEO role suggests that age is not a determining factor

in leadership attainment. Thus, based on gender, it can be concluded that leaders are not inherently born.

CAREER TRAJECTORY

What are the diverse paths to Fortune 500 CEO Positions?

In this analysis, data was gathered for all Fortune 500 CEOs except for 7 individuals, with null values excluded from the calculations.

Findings:

63% of Fortune 500 CEOs ascended to their roles through internal promotions or external career shifts.

21% of Fortune 500 CEOs previously held the CEO position at another company.

6% of Fortune 500 CEOs served as CEOs of internal subsidiaries or divisions before transitioning to the CEO role of the entire enterprise.

5% of Fortune 500 CEOs founded the company they currently lead.

4% of Fortune 500 CEOs were CEOs of external subsidiaries or divisions before assuming the CEO position at their current company.

1% of Fortune 500 CEOs became CEOs through a merger.

Analysis:

The predominant path to a Fortune 500 CEO position (63%) involves individuals either progressing internally or acquiring leadership experience externally. A deeper exploration, with additional data collection, could provide insights into the specific breakdown between those who rose through internal growth versus gaining leadership experience externally. Notably, founders constitute a relatively small portion of CEOs, suggesting that the majority of CEOs have climbed the corporate ladder, leveraging their accumulated experience. It's important to acknowledge that the data doesn't encompass founders who may have chosen to step down from their CEO roles. Further exploration in this area could offer a more comprehensive understanding of CEOs' career trajectories.

What percentage of Fortune 500 CEOs transitioned to the CEO role after previously serving as CEO of a subsidiary?

Out of all Fortune 500 CEOs, 10% ascended to the CEO position after having been the CEO of an internal or external subsidiary. Internal subsidiary experience slightly holds a higher proportion in this regard.

How many CEOs are new to their positions compared to those who were already in their roles?

Out of a total of 508 CEOs, 30 are newcomers, representing 6% of the total, while the remaining 94% are existing CEOs.

Summary of Career Trajectory Findings:

Examining the career paths of CEOs shows that the majority ascended to their positions via internal promotions or external career shifts. While this data doesn't definitively determine whether leaders are born or made, it provides valuable insight into the trajectories of leadership within organizations. Understanding the factors influencing their ascent—such as individual drive, personality traits, networking, and peer support—remains complex and multifaceted.

PROFITABILITY

What are the most profitable industries?

To determine the most profitable industries, median profit was utilized for an equitable comparison across all sectors. This approach was chosen to mitigate the impact of varying company counts within each industry, ensuring fair assessment regardless of industry size. Median profit was favored over total or average profit due to its resilience against extreme values or outliers, which can distort average calculations.

One company with a null profit value was excluded from the analysis, and duplicate entries were removed to maintain accuracy in calculating median profit.

The industry profit comparison is detailed in the table below:

Industry	Median Profit (in millions)
Telecommunications	4654
Aerospace & Defense	2551.5
Financials	2423.5
Health Care	2092
Media	2072.5
Technology	2062
Industrials	1746
Food & Drug Stores	1655
Chemicals	1631
Food, Beverages & Tobacco	1483
Energy	1331.5
Business Services	1312
Hotels, Restaurants & Leisure	1099
Household Products	1033

Retailing	878
Materials	859.5
Transportation	761
Apparel	680
Motor Vehicles & Parts	660
Engineering & Construction	574.5
Wholesalers	262

Findings:

Upon analyzing the median profit data, the Telecommunications industry emerges as notably more profitable than others. Following closely behind are Aerospace & Defense, Financials, Health Care, Media, and Technology.

Analysis:

These observations provide intriguing insights into industry profitability within the Fortune 500 landscape. However, they offer limited direct implications for understanding patterns among Fortune 500 CEOs.

Which CEOs helm the most profitable companies in each sector on the Fortune 500?

As per the table below, Tim Cook heads Apple, the most profitable company overall. Warren Buffett leads Berkshire Hathaway, the top performer in the Financials sector, while Andrew Jassy leads Amazon (now led by Jeff Bezos), the most profitable company in Retailing.

CEO	Company	Sector	Profit
Timothy D. Cook	Apple	Technology	94680
Warren E. Buffett	Berkshire Hathaway	Financials	89795
Andrew R. Jassy	Amazon	Retailing	33364
Darren W. Woods	Exxon Mobil	Energy	23040
Hans E. Vestberg	Verizon Communications	Telecommunications	22065
Albert Bourla	Pfizer	Health Care	21979
James D. Farley Jr.	Ford Motor	Motor Vehicles & Parts	17937
Jon R. Moeller	Procter & Gamble	Household Products	14306
Carol B. Tome	United Parcel Service	Transportation	12890
Alfred F. Kelly Jr.	Visa	Business Services	12311
James R. Quincey	Coca-Cola	Food, Beverages & Tobacco	9771
Christopher J. Kempczinski	McDonald's	Hotels, Restaurants & Leisure	7545
Kathy J. Warden	Northrop Grumman	Aerospace & Defense	7005
Leon J. Topalian	Nucor	Materials	6828

D. James Umpleby III	Caterpillar	Industrials	6489
Edward D. Breen	DuPont	Chemicals	6467
John J. Donahoe II	Nike	Apparel	5727
Ted Sarandos	Netflix	Media	5116
Jonathan M. Jaffe	Lennar	Engineering & Construction	4430
Randall T. Jones Sr.	Publix Super Markets	Food & Drug Stores	4412
Sean J. Kerins	Arrow Electronics	Wholesalers	1108

Findings:

As per the table above, Tim Cook heads Apple, the most profitable company overall. Warren Buffet leads Berkshire Hathaway, the top performer in the Financials sector, while Andrew Jassy leads Amazon (now led by Jeff Bezos), the most profitable company in Retailing.

Analysis:

These findings illustrate the CEOs leading the most profitable companies within their industries. However, they do not provide insight into whether their ascent to CEO positions was due to inherent traits or acquired skills.

Summary of Profitability Findings:

Examining industry profitability and the CEOs at the helm of highly profitable companies offers valuable insights. However, these findings do not offer any indication as to whether CEOs' leadership qualities are innate or developed.

LIMITATIONS AND ASSUMPTIONS

The final dataset comprised 508 records, representing the Fortune 500 subset of the complete Fortune 1000 dataset obtained from Kaggle. While ideally, data for all 1000 companies would have been collected, time constraints necessitated limiting the analysis to 500 records, which were considered sufficient for this preliminary examination. It's worth noting that the dataset used may not be the most current Fortune 500 dataset available; however, this does not significantly impact the insights derived from the analysis.

Additional columns were incorporated into the dataset through supplementary data collection efforts, albeit with incomplete information compared to the Fortune 500 subset of the Fortune 1000 dataset. This resulted in a higher incidence of missing values in the additional data collected. For instance, only 28% of records included date of birth (DOB) information, which, while still used for analysis, may have affected the robustness of the insights due to the limited availability of DOBs and corresponding zodiac signs.

The credibility of the additional data collected is contingent upon the reliability of online sources. Moreover, there is a possibility that null or 'no' values could be altered with the discovery of relevant data. For instance, if a CEO's graduate school or major was not listed on the company website or other sources, it was assumed that the CEO did not attend graduate school, even though they may have obtained a Master's degree that was not documented on the company site.

The zodiac signs Aries, Leo, and Capricorn were designated as natural-born leader signs based on their frequent appearance as leadership indicators on various astrology websites.

In cases where ties occurred among the top 20 schools in the education analysis, schools were chosen from lists sourced from a few school ranking websites. Since there is no official ranking list for Ivy League and other prestigious schools, this selection process may be subjective, although it is unlikely to significantly impact the results given the equivalent rankings of the schools chosen to break the tie.

The analysis presented in this report relies solely on the available data. As discussed throughout, there may be external factors influencing a CEO's career trajectory and growth that are not captured in this analysis. To explore alternative theories, additional data on other factors would need to be collected and analyzed separately.

Given the philosophical nature of the analysis aimed at understanding whether leaders are born or made, the interpretation of the insights may incorporate personal biases or ideas that could potentially influence the results.

CONCLUSION

In answering the question of whether leaders are born or made, the evidence points more towards the latter.

The analysis of zodiac signs suggests that any zodiac sign can lead to becoming a CEO, indicating that CEO potential is not inherent from birth.

The educational findings demonstrate that 93% of CEOs possess technical proficiency acquired through earning a Bachelor's degree, with a preference for quantitative disciplines. Additionally, MBAs and graduate degrees from esteemed universities are highly favored, while attendance at Ivy League institutions remains relatively low. These results underscore the significance of educational choices in CEO attainment.

The age findings indicate that CEOs generally reach their positions at similar stages in their careers, typically later in life, indicating a steady advancement driven by years of leadership experience. This implies that the path to CEO roles is characterized by a process of continuous development and refinement of leadership skills.

The analysis of gender data reveals that the age at which men and women become CEOs is similar, indicating that gender is not a determining factor in the timing of CEO appointments. This suggests that CEO positions are not biased towards a particular gender in terms of age, emphasizing the role of individual merit and opportunities in reaching CEO status. However, the lower representation of women in CEO positions underscores ongoing gender disparities in corporate leadership.

Origin findings reveal that 64% of CEOs have relocated from their home state, indicating a propensity to adapt to new environments, which may be indicative of an innate quality for embracing change. However, further comparative analysis with a non-CEO sample is necessary to draw definitive conclusions regarding whether CEOs are inherently predisposed to adaptability or if external factors influence relocation decisions. Thus, the current findings on the nature of CEOs' origin remain inconclusive.

Regarding career trajectory, the findings suggest that the majority of CEOs have progressed to their positions through internal promotions or external career transitions. However, the available data lacks granularity to delineate the specific pathways they followed to attain the CEO role. Further data collection on factors such as the number of companies they worked for, tenure at each company, duration in various roles, and the progression of responsibilities could provide deeper insights into the patterns of CEO ascension. Without this additional information, it is challenging to determine conclusively whether CEOs are inherently predisposed to leadership roles or if external factors, such as networking or peer support, play a significant role in their career progression. Thus, the current analysis leaves the question of whether CEOs are born or made based on their career trajectories inconclusive.

This conclusion is solely based on the analysis and findings presented in this report, without consideration of external factors.

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