

WOMEN
at the **WHEEL**

==== DO FEMALE EXECUTIVES DRIVE START-UP SUCCESS? =====

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EXECUTIVE SUMMARY.

ACCORDING TO THE 2010 U.S. CENSUS, more adults over the age of 25 than ever before (30%) have college degrees, with more women earning bachelor's and advanced degrees than men. While women have outnumbered men in college enrollment since the 1980s and undergraduate degrees earned since 1996, 2010 was the first time women earned more advanced degrees than men. This leaves the open question: **Why are women so poorly represented in senior executive roles?**

This study focuses on the current state of women in U.S. venture-backed companies and how women in leadership roles affect the success of a start-up. To accomplish this, we reviewed more than 15 years of venture-backed company data and executive information in the VentureSource database.

IN COMPARING SUCCESSFUL VERSUS UNSUCCESSFUL COMPANIES, OUR ANALYSIS UNVEILS:

- 1.3% of privately held companies have a female founder, 6.5% have a female CEO, and 20% have one or more female C-level executives.
- The most common positions held by female executives were within Sales & Marketing roles, accounting for 27% of the total population sample.
- The overall median proportion of female executives is 7.1% at successful companies and 3.1% at unsuccessful companies, demonstrating the value that having more females can potentially bring to a management team.
- By industry, we identify the median proportion of female executives at successful companies as higher than that of unsuccessful companies in the IT, healthcare, consumer services, and business and financial services industries, which are the four largest sectors.
- We see that a company's odds for success (versus unsuccess) increase with more female executives at the VP and director levels.
- For start-ups with five or more females, 61% were successful and only 39% failed.

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Acknowledgments

Guidance given by

PROF. ERIC A. SUESS, California State University, East Bay

Editing assistance by

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WOMEN AT THE WHEEL



DO FEMALE EXECUTIVES DRIVE START-UP SUCCESS?

Does having a
higher proportion of
female executives
at a venture-backed
start-up
improve the
company's chances
for success?

I Methodology

1.1 VENTURESOURCE DATABASE

Dow Jones VentureSource has been tracking financing events, people, companies, and investors involved in the venture capital (VC) industry. With more than 25 years of historical data, VentureSource has comprehensive industry statistics dating back to 1987 for the U.S., 2000 for Europe and Israel, 2005 for China, 2007 for India, and 2008 for Canada. Data is collected through a combination of primary and secondary sources with each datapoint thoroughly reviewed under rigorous methodology.

1.2 EXECUTIVE INFORMATION

VentureSource tracks over 300,000 current and former executives globally. Each person is a senior-level executive with direct decision-making responsibilities for the company or investment firm.

For this study, we looked at companies headquartered in the United States but included all executives, regardless of location. The 20,194 VC-backed companies analyzed in this report received an equity financing between 1997 and 2011, or exited between 1997 and 2011. The resulting sample size consisted of 167,556 executives, of which 11,193 were female.

Company executives in this study were grouped in the following categories: founder, board member, C-level, VP level, and director.

1.3 SUCCESS

In this study, companies are defined in two ways:

- “Successful” is considered: exited through an initial public offering (IPO), is in IPO registration, is privately-held and consistently profitable or has been acquired for an amount greater than its total venture investment (i.e. had an exit ratio greater than one).
- “Unsuccessful” companies are divided into two categories:
 - “Not Yet Successful” are still private and independent but have not yet become successful, as defined above.
 - “Failed” companies have ceased operations, gone bankrupt, or exited at a valuation below their total venture capital funding.

Exit ratios are calculated as exit valuation/total venture investment. Acquisitions with an unknown exit ratio have been excluded from the “Successful” versus “Unsuccessful” data set.

1.4 INDUSTRY BREAKDOWN

VentureSource groups companies into the following industries: business and financial services, consumer goods, consumer services, energy and utilities, healthcare, industrial goods and materials, and information technology (IT).

1.5 STATISTICAL METHODS

All of the statistical methods in this report are benchmarked against the 0.05 significance level, meaning our conclusions are claimed with 95% confidence. When we refer to a distribution as normal, we are observing that the distribution is a Gaussian distribution, or bell-shaped curve symmetrical about the mean, which is equal to the median. We applied the Shapiro-Wilk test for normality. When results produce a *p-value* less than 0.05, the data is considered not normal, and we perform non-parametric tests on the data.

For all boxplots, bars at the end of dotted lines represent the lower inner fence and upper inner fence of the dataset, excluding the outliers. The lower inner fence and upper inner fence are calculated as the (First Quartile)-(1.5 x Interquartile Range) and (Third quartile)+(1.5 x Interquartile Range), respectively. The lines, from bottom to top, in the box are the 25th, 50th (median), and 75th percentile marks, respectively. The 25th percentile mark often overlaps with the lower inner fence mark, in which case only the former is labeled in the boxplots. Green dots denote averages.

2 Venture Industry & Female Executives

2.1 VENTURE CAPITAL INDUSTRY TRENDS

Historically, IT has dominated venture investment globally. In 2011, there were 3,344 U.S. venture deals

that raised \$34.14 billion, of which \$8.24 billion went to IT. This is a 16% increase in financing over 2010 but still 64% below the peak of the dot-com bubble in 2000.

FIG 2-1

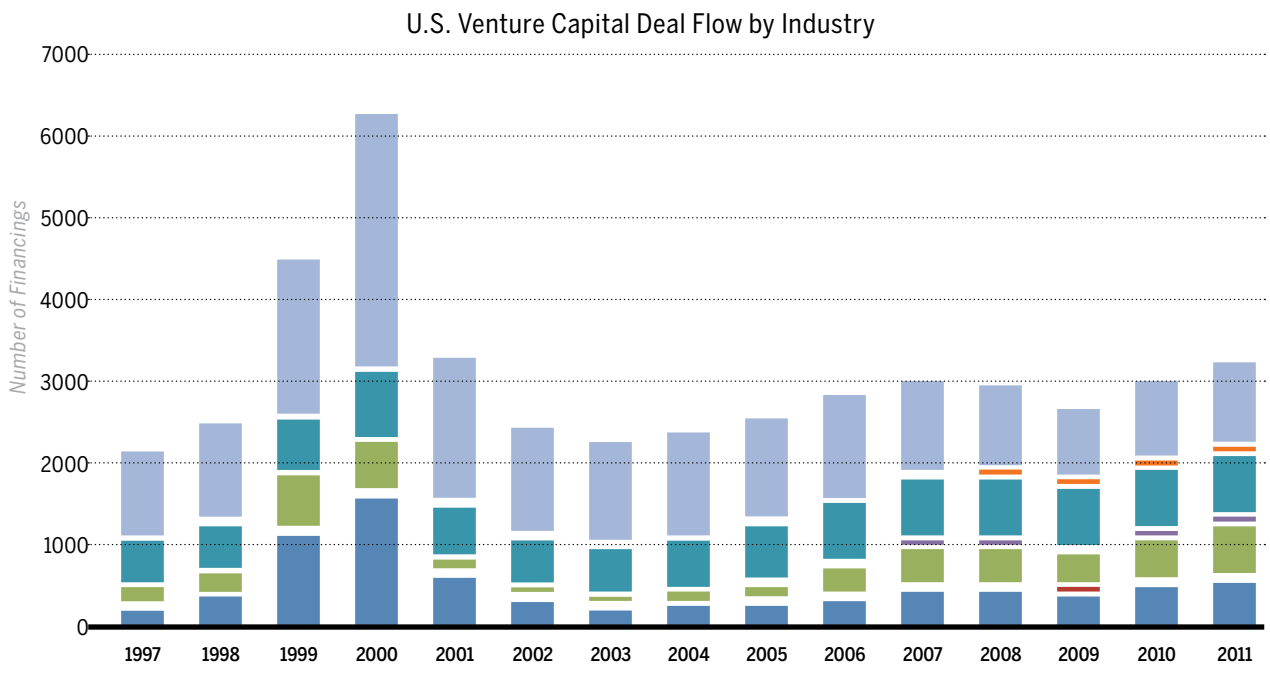
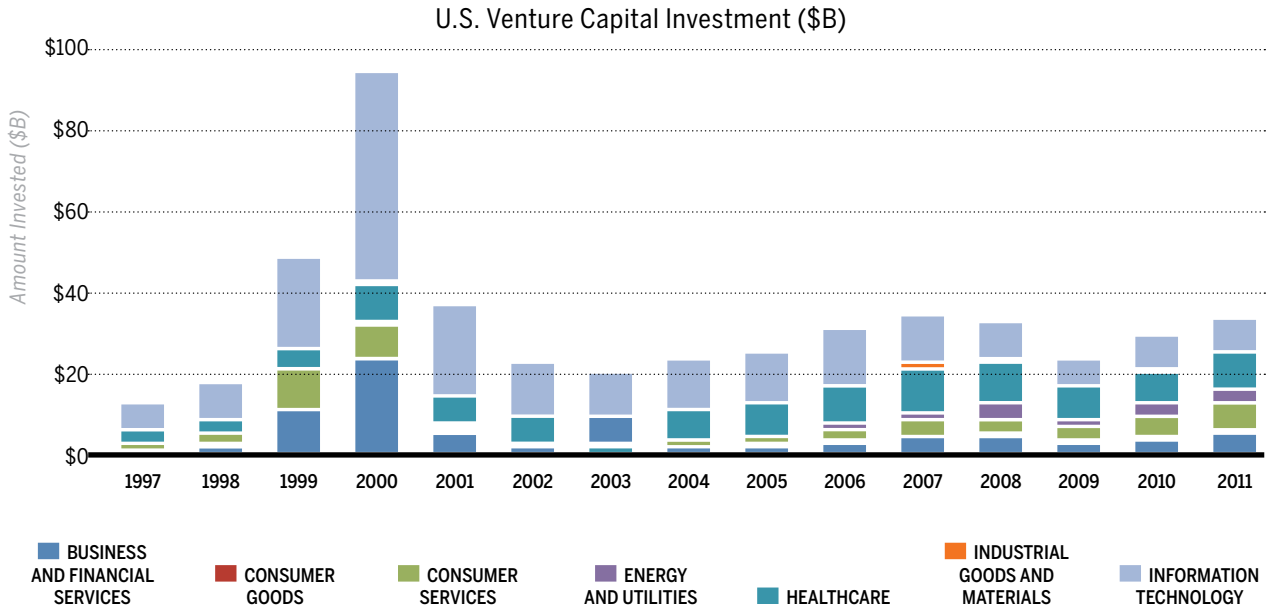


FIG 2-2



WOMEN AT THE WHEEL: Do female executives drive start-up success?

There were 568 exits in 2011, an 8% and 19% decline from 2010 and 2000, respectively. IT accounted for

nearly 39% of total venture exits in 2011 with 205 acquisitions and 16 IPOs.

FIG 2-3

U.S. Venture-backed IPOs by Industry and Year of IPO

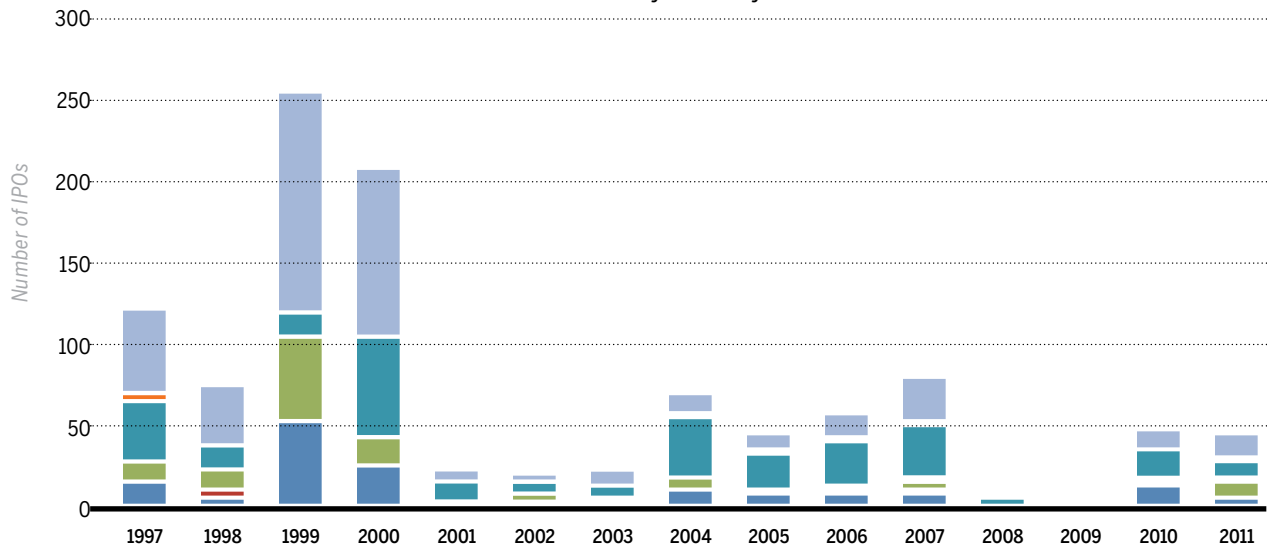
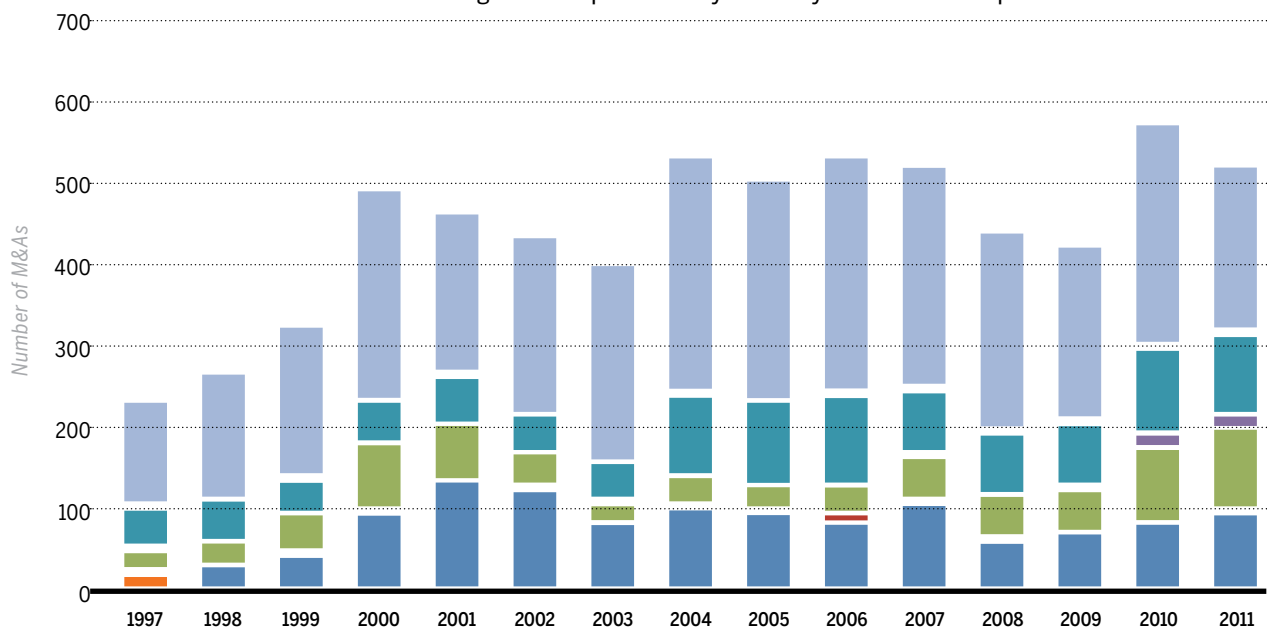


FIG 2-4

U.S. Venture-backed Mergers & Acquisitions by Industry and Year of Acquisition



■ BUSINESS AND FINANCIAL SERVICES
 ■ CONSUMER GOODS
 ■ CONSUMER SERVICES
 ■ ENERGY AND UTILITIES
 ■ HEALTHCARE
 ■ INDUSTRIAL GOODS AND MATERIALS
 ■ INFORMATION TECHNOLOGY

WOMEN AT THE WHEEL: Do female executives drive start-up success?

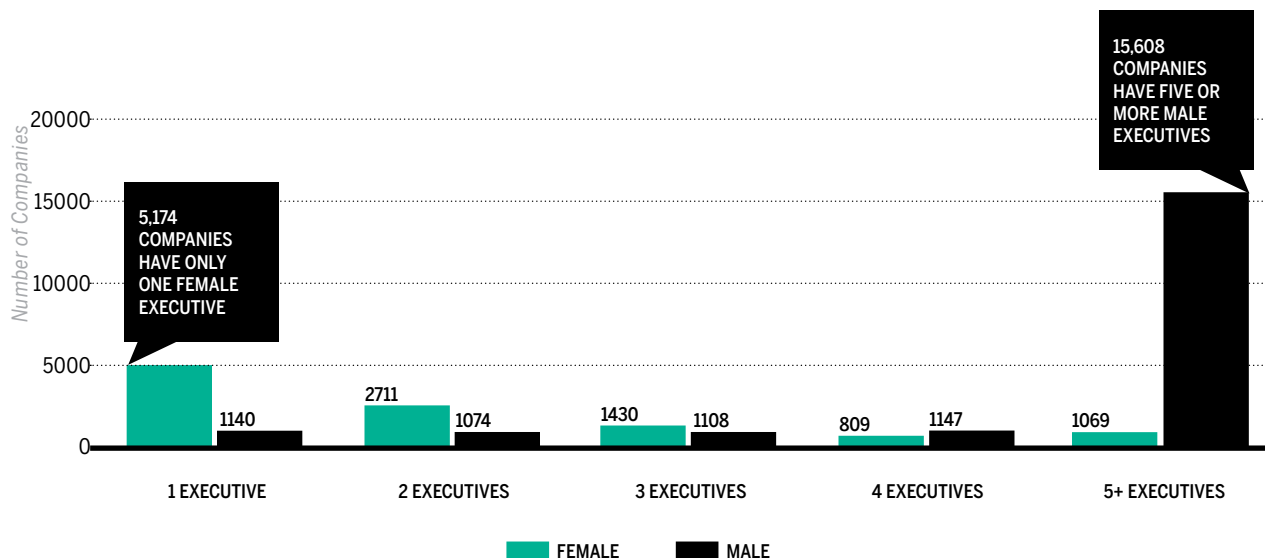
2.1.1 FEMALE EXECUTIVES IN VENTURE-BACKED COMPANIES

Since 1997, 55% of the pool of 20,194 U.S. VC-backed companies have had at least one female executive. The proportion of female to male executives at these companies is two to nine. (Figure 2-5)

Companies are likely to have just one or two female executives (approximately 40% of the sample), compared with five or more male executives (78% of the sample). However, looking at just the number of females does not tell the full story. Analyzing the proportion of females to males and the subgroups of success and industries are where differences between genders are more evident.

FIG 2-5

Number of Companies by Total Number of Males and Females on Management Team

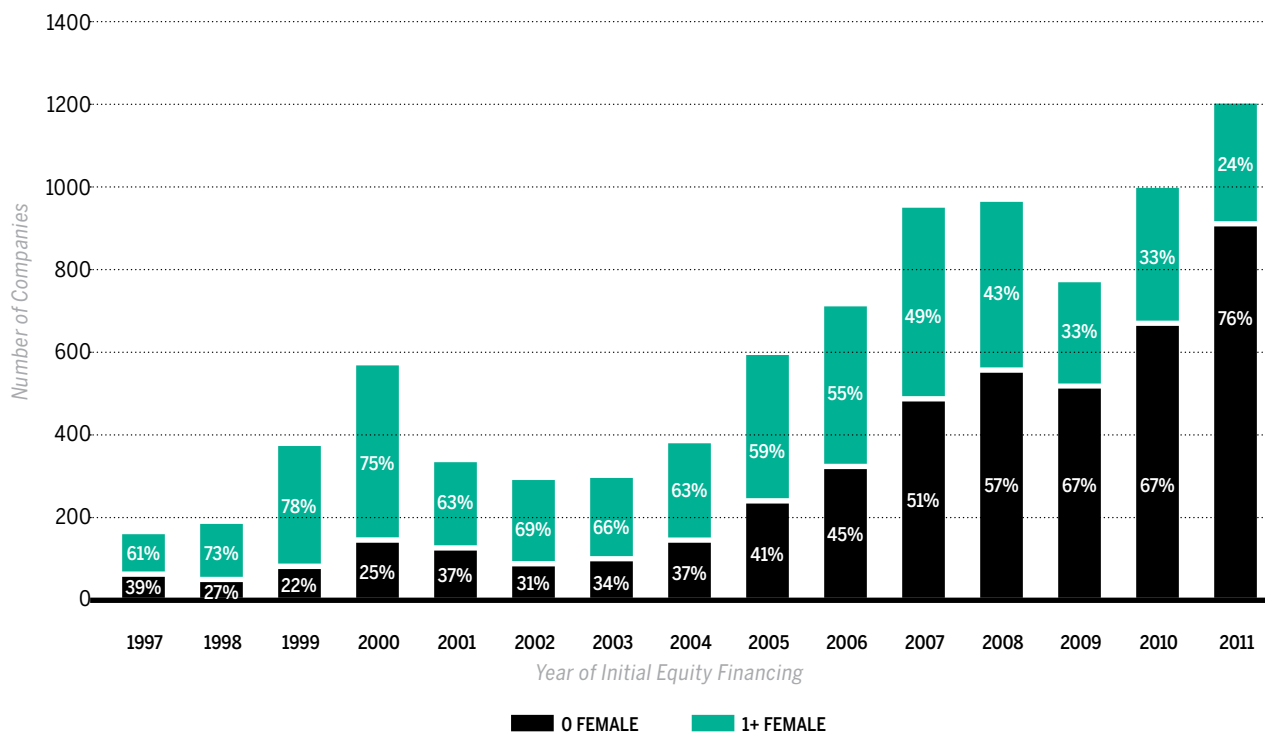


Currently privately-held companies make up 44% of this sample. Nearly half of these 9,978 companies have at least one female executive. Of the 94,000 employees who have worked in a director-level position or higher at these companies, some 10% (9,300) were female and 90% (84,000) male.

Companies that received initial equity financing in 2006 or earlier are more likely to have one or more female executives, whereas companies backed in 2011 have the fewest. (Figure 2-6) **The trend implies that companies hire more female executives as they advance.**

FIG 2-6

Percent of Still Private Companies with Female Executives by Initial Financing Year



Early-stage companies are more likely to have no female executives and few employees, often with a limited group comprising a founder, CEO, and few high-level executives. In our sample,

1.3% of privately held companies have a female founder, 6.5% have a female CEO, and 20% have one or more female C-level executives.

DEVELOPMENT STAGE	0 FEMALE	1+ FEMALE	ALL COMPANIES
Startup	83%	17%	395
Product Development	59%	41%	2003
Generating Revenue	49%	51%	5372
Profitable	34%	66%	1188
Restart	50%	50%	20
ALL COMPANIES	51%	49%	8978

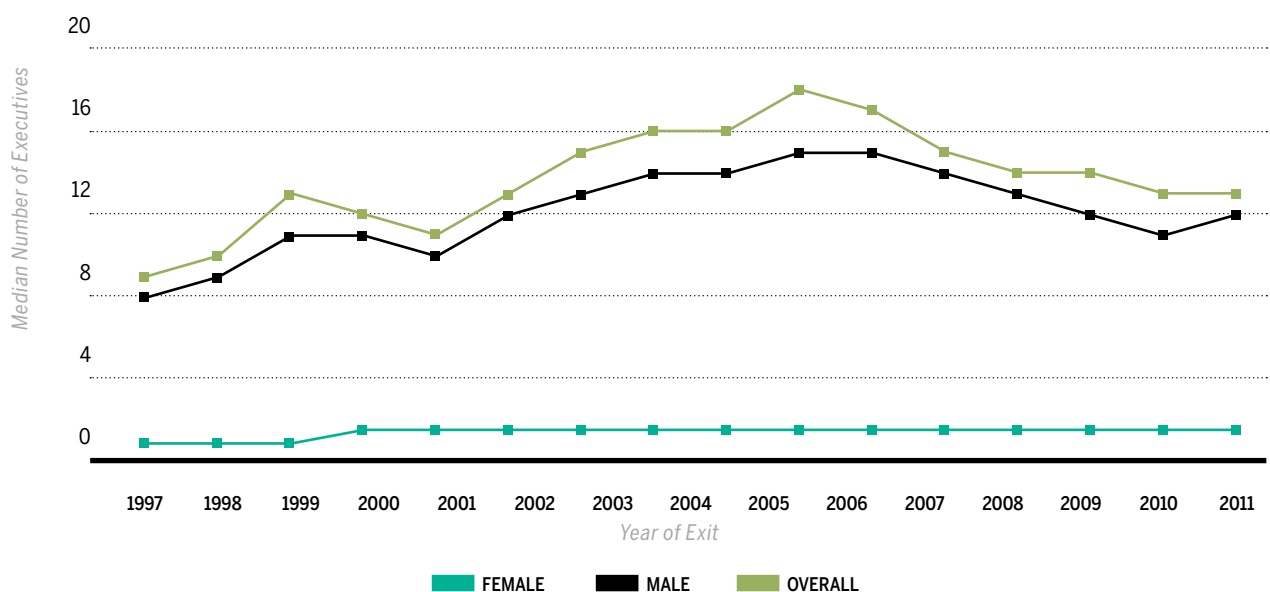
2.1.2 EXITED VENTURE COMPANIES

A VC-backed exit refers to a company that was acquired, merged, or went public, and as a result, its investors no longer hold any equity. Figure 2-7 shows the median number of all executives at companies

that exited between 1997 and 2011. The overall median number of executives at these companies was 13, while the median number for male executives and female executives was 12 and 2, respectively.

FIG 2-7

Median Number of Executives in Exited Companies by Gender and Exit Year



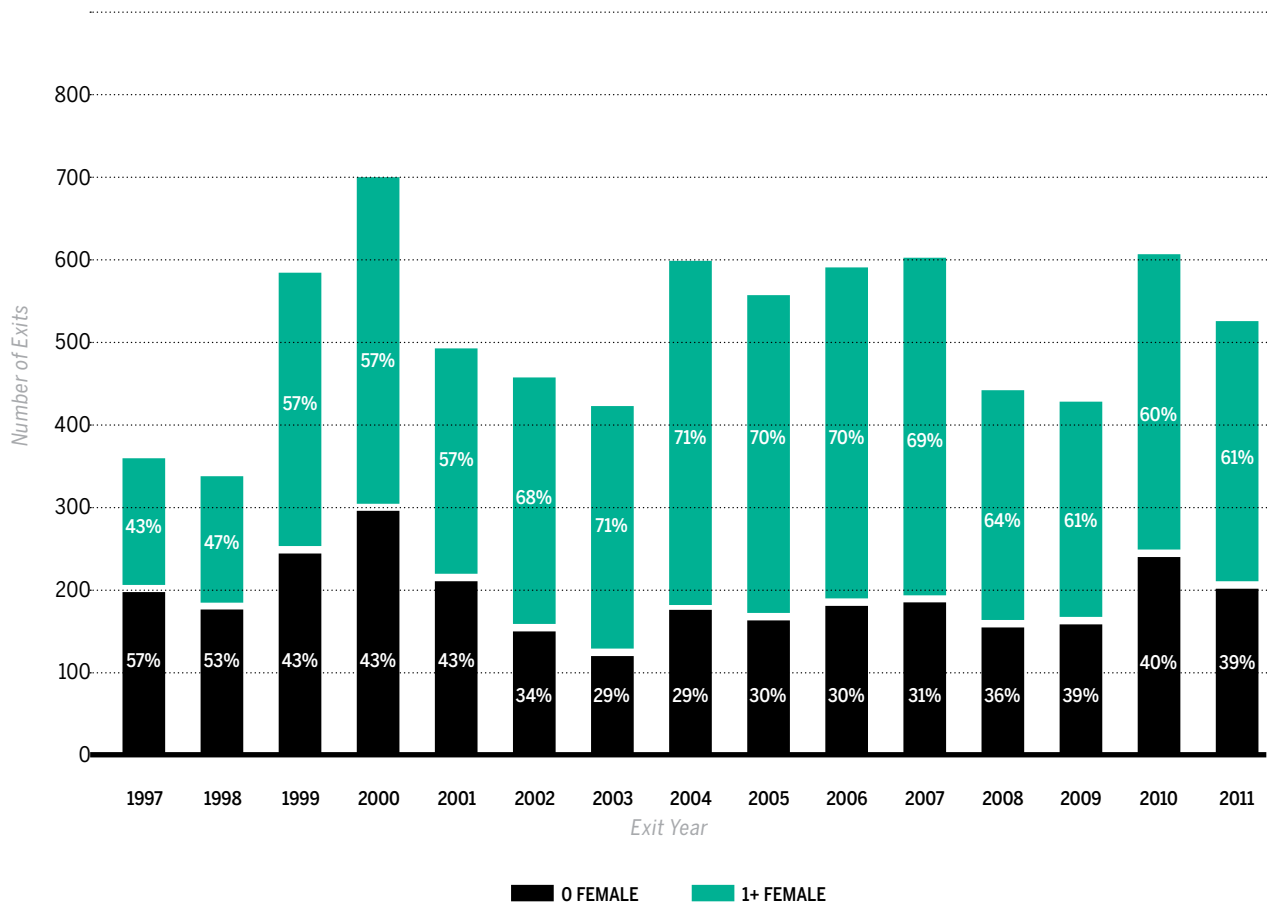
2.1.2.1 PROPORTION OF EXITED COMPANIES WITH FEMALE EXECUTIVES OVER TIME

The percentage of VC-backed exits with at least one female executive has been steadily increasing from 43% in 1997. During the 1999 dot-com bubble, women crossed the 50% threshold. Upon reaching a high

of 71% in the exit doldrums of 2003, the percent of venture-backed exits with at least one female executive dropped to 61% in 2011. Of successful VC-backed exits, 64% of companies had at least one female executive. (See Section 3.)

FIG 2-8

Percent of Exited Companies with One or More Female Executives



2.1.2.2 COMPARING FEMALE PRESENCE IN IPOs VS. ACQUISITIONS OVER TIME

The presence of female senior executives differs notably between companies that had an IPO versus an acquisition. The percentage of VC-backed M&As with at least one female executive between 1997 and 2011 hovered between 60% and 70%. However, the same metric for IPOs was much higher: 75% or more of IPOs had at least one female executive since 2003. In 2011, 58% of acquisitions had at least one female executive compared to 84% of IPOs.

The median time to liquidity for those that exited between 1997 and 2011 was 4.3 years. Surprisingly, a large percentage of companies in operations for more than four years before their exit had zero female executives. (See Appendix Figures 6-1 and 6-2 for M&A and IPO breakouts.)

The proportion of female executives at exited companies climbed slightly but still remains a minority, regardless of “success”, when looking at the history of exited companies through an IPO or acquisition between 1997 to 2011.

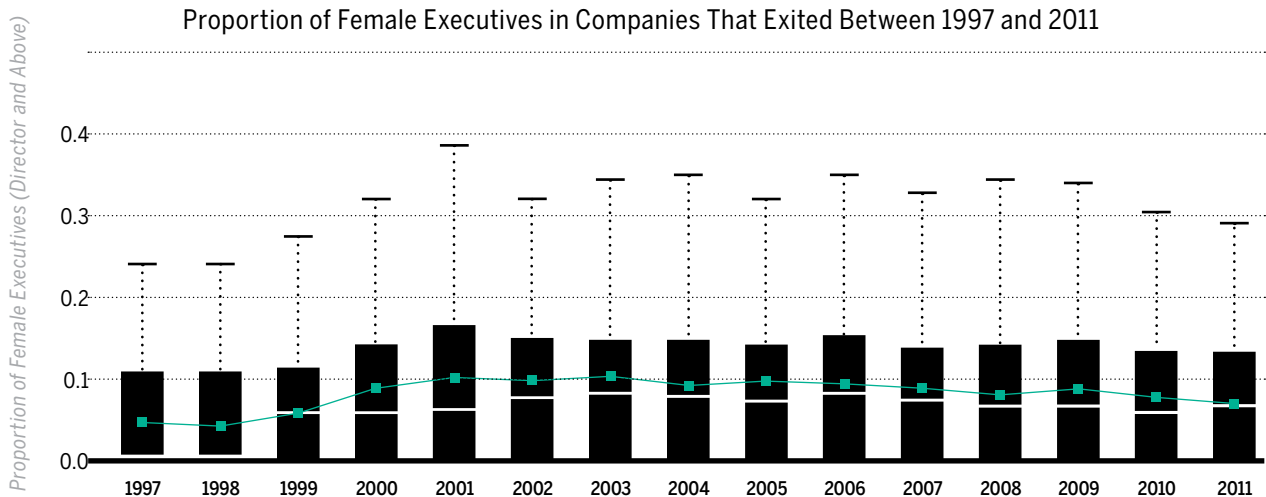
Figure 2-9 shows the proportion of female executives in boxplots according to the company's exit year.

For 1997 and 1998, the median proportion of females at companies that exited was 0.0% with an upper quartile of 11.1%. This was due to a smaller portion of exit data at that time. The median and the mean have been increasing since 1998, reaching a peak in 2003 but declining in the 2008 recession; the median went from 5.9% in 1999 to 8.3% in 2003, and the mean went from 6.9% in 1998 to 10% in 2003. This is likely because of a contraction in the liquidity environment for start-ups in 2008, not a change in the proportion of females in the start-up community.

2.1.2.3 PROPORTION OF FEMALE EXECUTIVES WITHIN EXITED COMPANIES

The boxplots below detail participation and employment for female executives at exited companies by exit year. The boxplots show positively skewed distributions, meaning that the average female proportion is greater than the median proportion of female executives of the respective exit year, and a large amount of companies have a smaller proportion of female executives. Since the distribution is skewed, we examine the data by medians, a better metric for judging the distribution. The female executive proportion medians show small movement. However, the proportion of female executives at exit companies has been trending upward, with the median proportion of female executives from 2002 to 2011 generally higher than those from 1997 to 2001.

FIG 2-9



2.2 PROPORTION OF FEMALE EXECUTIVES BY INDUSTRY

This section examines female executives by their industry groups.

The boxplots below depict the distributions of female executive proportions in all the companies in the study, by industry groups. The green dots represent averages of the female executive proportion for each industry. The boxplots suggest the distributions of female

executives differ depending on the industry. Again, all the averages are higher than the medians since the distributions are positively skewed.

Companies in the business and financial services and healthcare industries tend to have a higher percentage of female executives. Companies in the energy and utilities and industrial goods and materials industries hire fewer women overall and have a smaller proportion of female executives than that of other industries.

FIG 2-10

Close-Up of Proportion of Female Executives by Industry Group

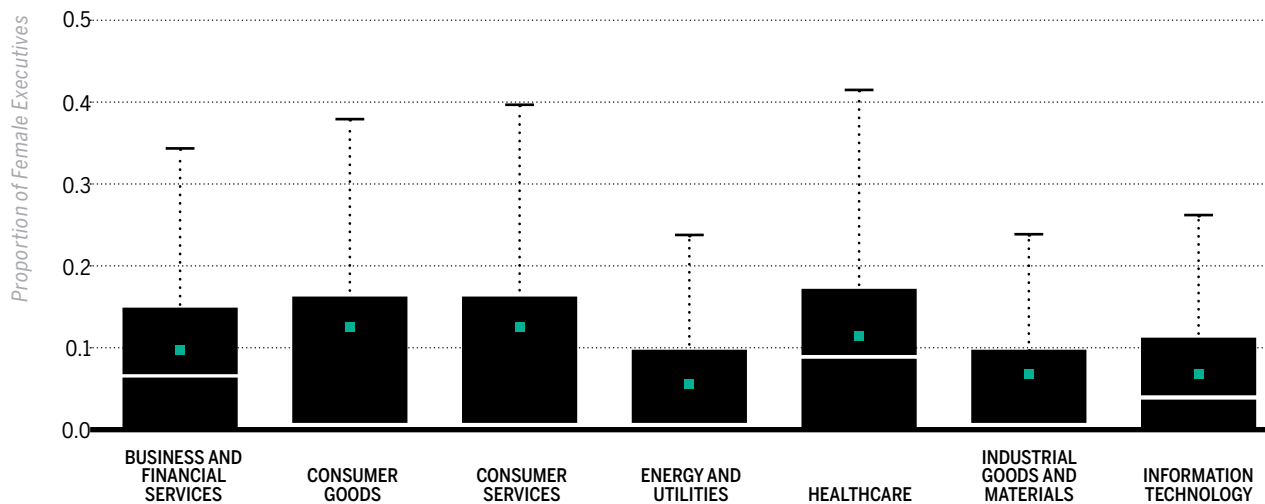
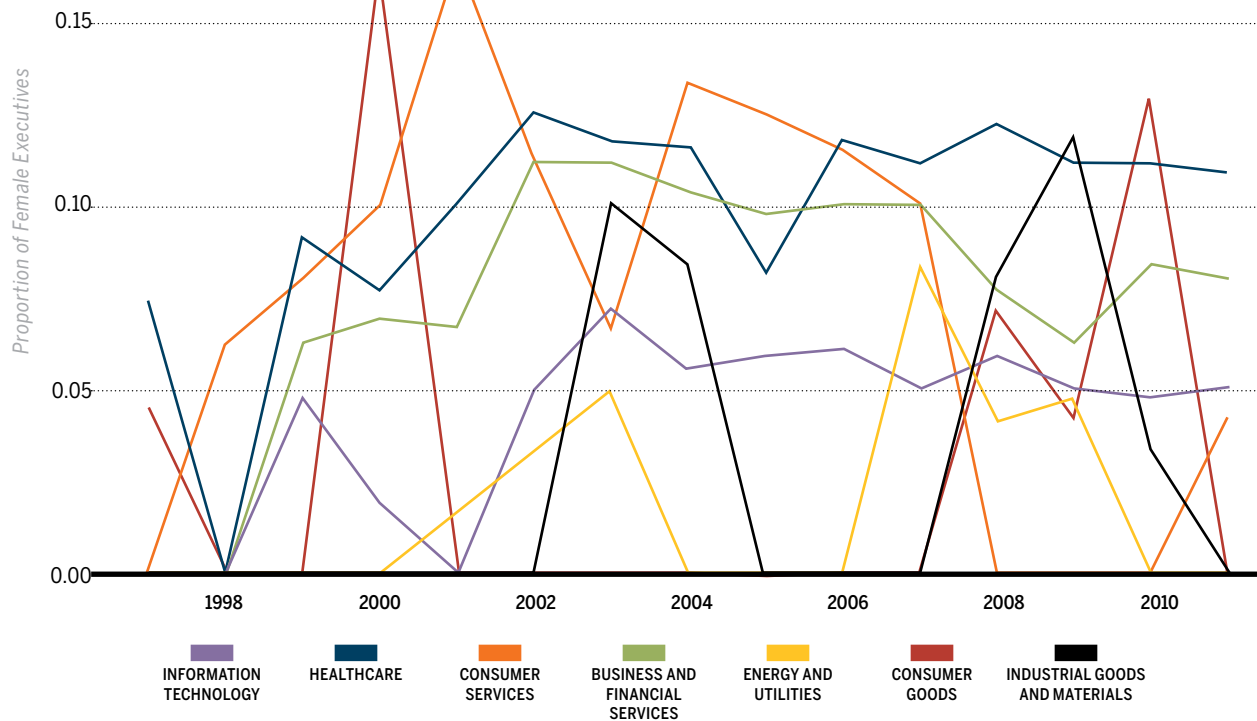


FIG 2-11

Median Proportion of Female Executives of Exited Companies per Year by Industry



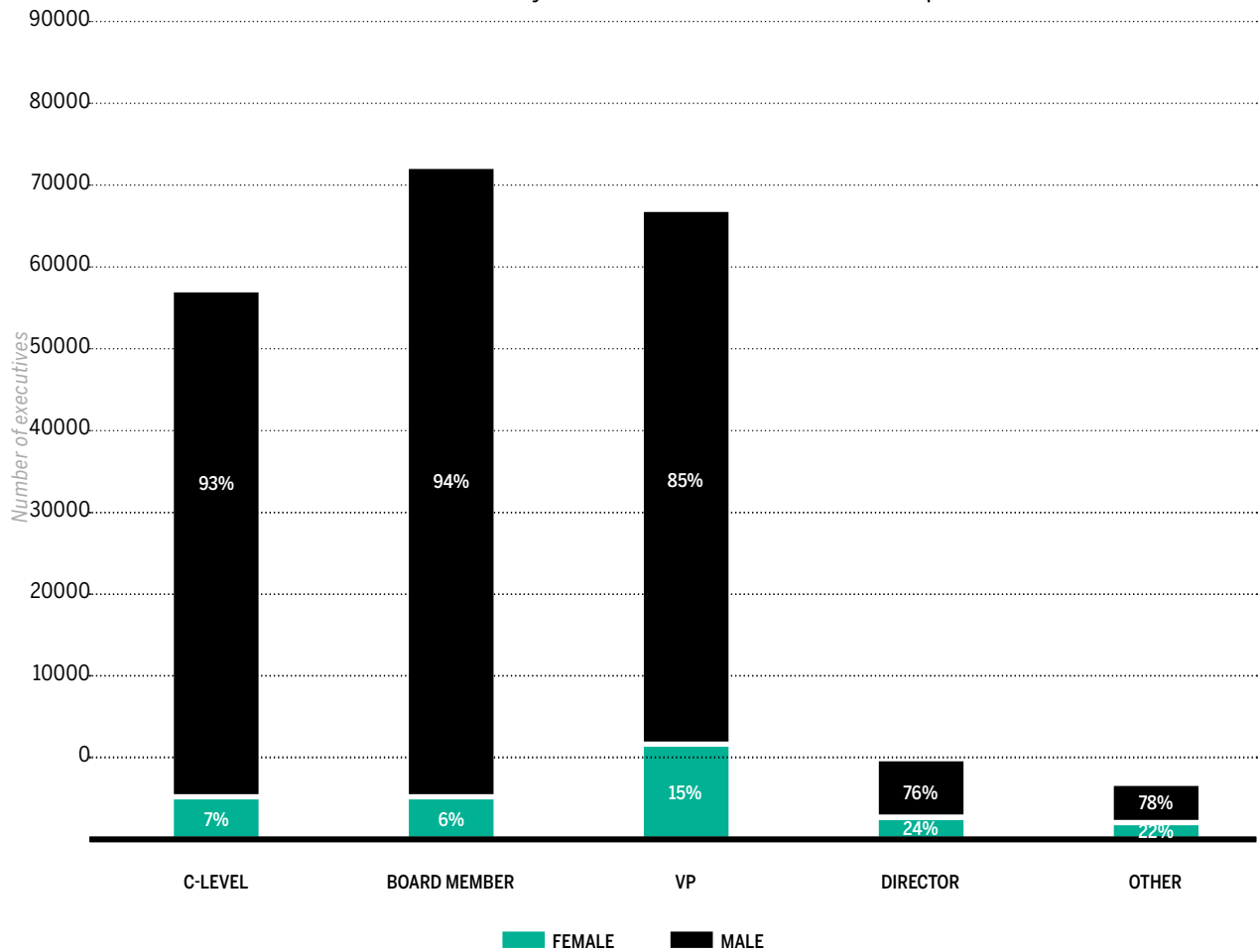
2.3 TITLE ANALYSIS

The female roles at VC-backed companies have varied by title. While males dominated in every title level (Figure 2-12), most notably the C-level and board positions, females have made a larger dent in the VP,

director, and other titles (“other” refers to managers, consultants, general counsels, engineers, etc.). Also, start-ups naturally have fewer director-level executives during their early stages.

FIG 2-12

Executive Breakdown by Title Level and Gender for All Companies

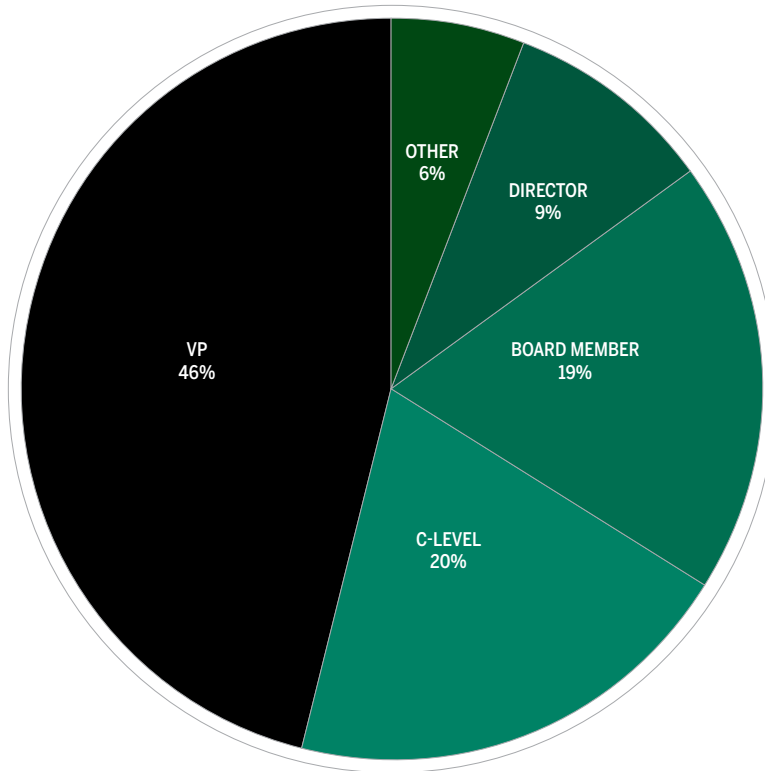


Analyzing just female executives at VC-backed companies, 46% held a VP-level position, compared to 30% of males. C-level roles consist of 20% females

versus 28% of males, and 19% of females served as board members compared to 36% of males.

FIG 2-13

Female Title Breakdown for All Companies



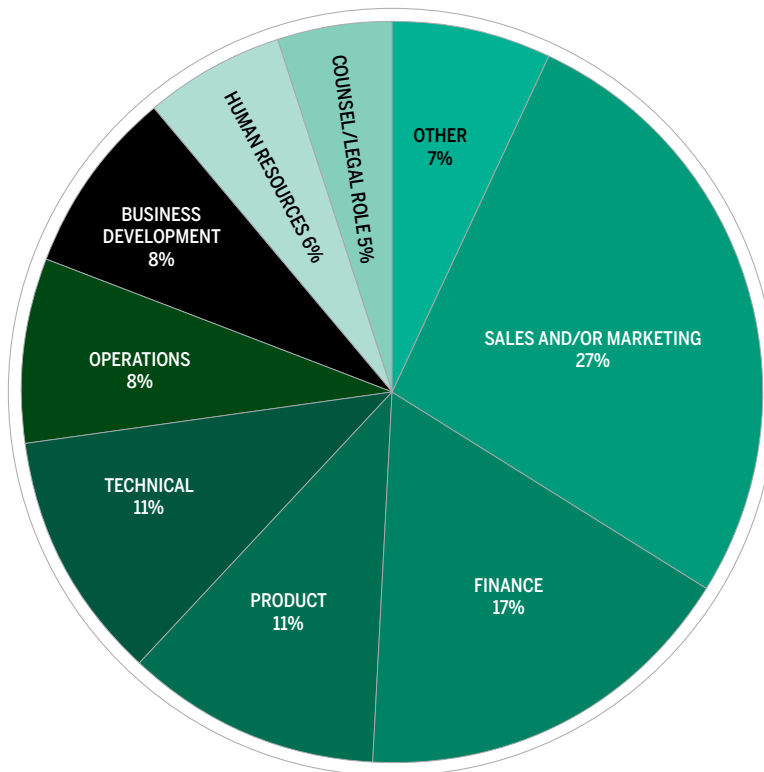
(SEE APPENDIX FIGURE 6-3 FOR THE MALE TITLE LEVEL BREAKDOWN FOR EXITED COMPANITES.)

A deeper analysis of the executives' titles shows what verticals had higher concentrations of females.

The most common positions held by female executives were within Sales & Marketing roles, accounting for 27% of the total population sample. (See Figure 2-14.)

FIG 2-14

Female Title Breakdown for Exited Companies



(NOTE: ADMINISTRATION ROLES APPEAR WITHIN "OTHER," AS THERE WERE NOT ENOUGH TO BREAKOUT.)

3 Successful vs. Unsuccessful Companies

The thesis for this paper claimed that having a higher proportion of female executives at venture-backed start-ups improves the ultimate success of the company. We grouped companies into two

categories in order to further analyze this section of the report: successful and unsuccessful. (See Section 1.3 for definitions.)

FIG 3-1

Annual Pool of Companies per Year

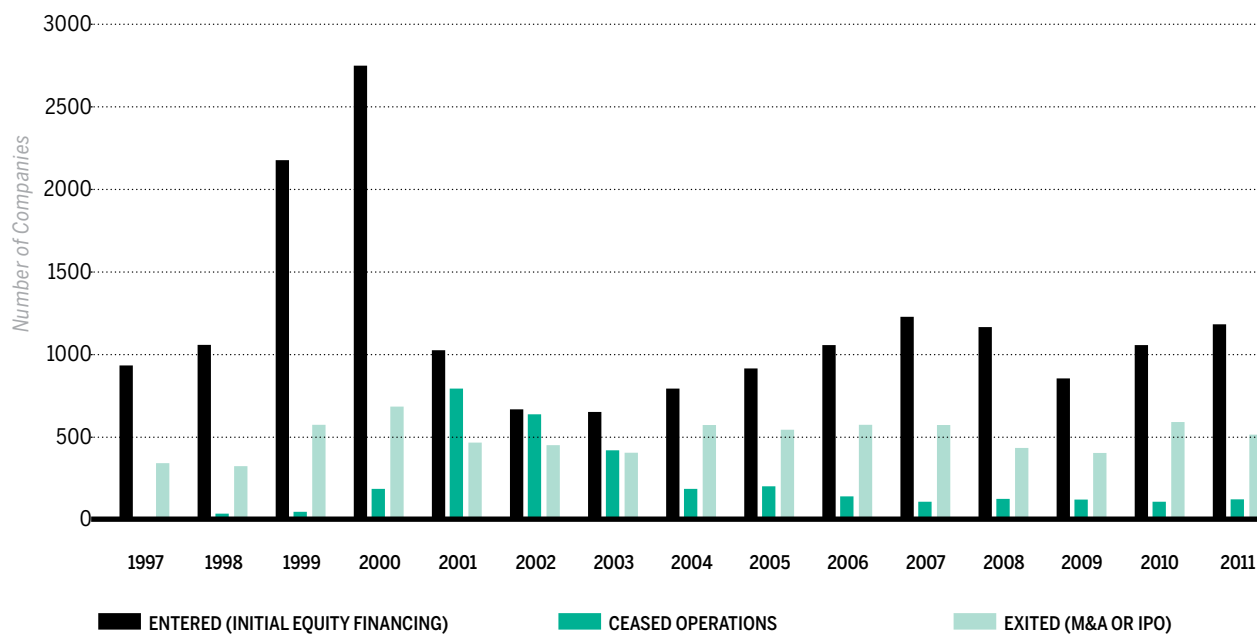
TIER 1	TIER 2	NUMBER OF COMPANIES	% OF COMPANIES
Unsuccessful	Failed	4367	35.8%
	Not yet successful	7833	64.2%
UNSUCCESSFUL TOTAL		12200	60.4%
SUCCESSFUL		4321	21.4%
UNKOWN		3673	18.2%
TOTAL NUMBER OF COMPANIES		20194	

There are more companies entering the VC industry each year than are exiting, as shown in Figure 3-2, which means investors have to decide which companies to continue supporting. For this section,

companies still in an investor's portfolio and operating privately but not yet profitable, in addition to the companies that went bankrupt or ceased operations, are considered "Unsuccessful."

FIG 3-2

Annual Pool of Companies that Entered, Exited, and Ceased Operations per Year



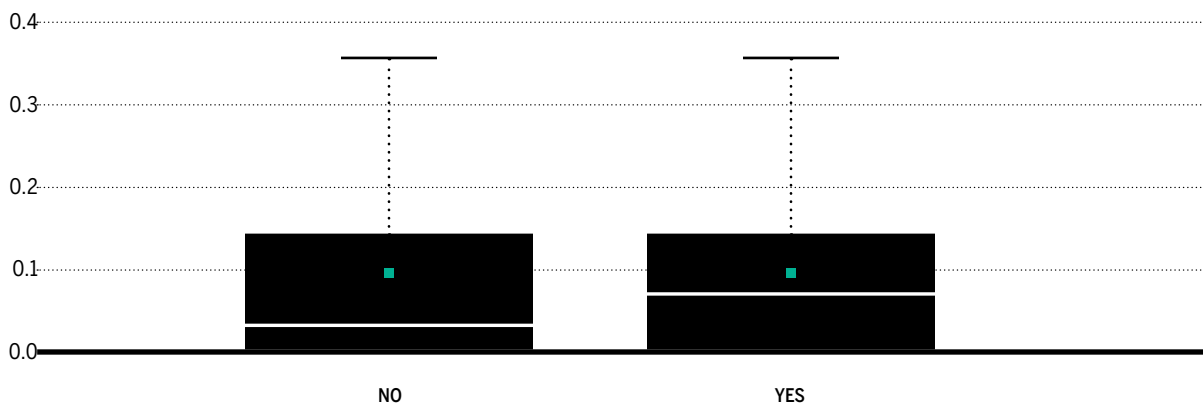
3.1 DEPENDENCE RELATIONSHIP BETWEEN PROPORTION OF FEMALE EXECUTIVES AND SUCCESSFUL RATE OF COMPANY

The figures below include all industries.

The overall median proportion of female executives in successful companies is 71%, compared to 3.1% at unsuccessful companies (Figure 3-3).

FIG 3-3

Proportion of Female Executives by the Ultimate Success of the Company



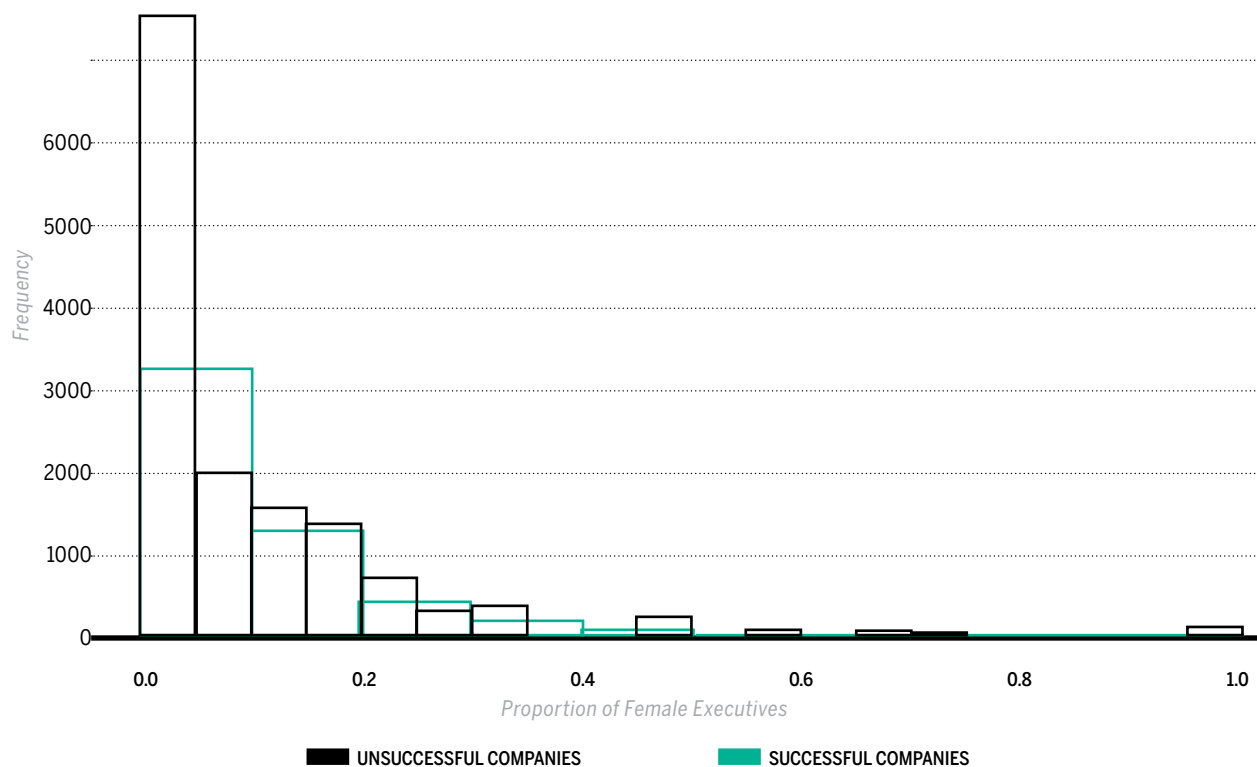
(NOTE: THE AVERAGES, DISPLAYED BY GREEN DOTS, ARE ALMOST IDENTICAL.)

The histograms below represent differences in the distributions of female executives between successful and unsuccessful companies. Successful companies have a sample standard deviation of 0.103 while that of unsuccessful companies is 0.139. The unsuccessful companies' female executive proportions are more

spread out, and include more companies that have no female executives. The distribution of the successful companies is less skewed, and shows that companies with an executive team composed of 5% to 25% female executives are successful.

FIG 3-4

Comparative Histograms of Proportion of Female Executives by the Ultimate Success of the Company



Through the application of Pearson’s Chi-Square test with Yates’s continuity correction, we evaluated if a dependence exists between a company with any female executives and its success. **We claim with statistically significant evidence that there is a dependence between a company having female executives and its success.**

Since the proportion of female executives for all companies is not normally distributed, we applied the Mann-Whitney-Wilcoxon test to examine the hypothesis that successful companies have greater

population median proportions of female executives than those of unsuccessful companies. From the resulting *p-value*, we claim the population median proportion of female executives of the successful companies is statistically significantly greater than that of unsuccessful companies.

To better understand the relationship between female executives and the success of the company, it is imperative to understand venture capital and how changes in industry investments can affect the liquidity options and likelihood of success for companies.

3.2 Industry Analysis

3.2.1 SUCCESSFUL VS. UNSUCCESSFUL BY INDUSTRY

By industry, energy and utilities companies have seen the lowest success rate, while IT companies have the highest. This is attributed to the IT industry's historical domination. The majority (79%) of companies that entered the energy and utilities industry are still privately held and operating, so they are classified as "not yet successful." While IT is consistently one of the largest investment sectors and has seen the highest

success rate, it is tied with business and financial services companies for having the largest failure rate too. **Nearly one-third of companies in the IT and business and financial services industries have failed.** Overall, between 71% and 87% of each industry consists of unsuccessful companies (consisting of those labeled failed and not yet successful). The failed companies within these groups are addressed separately from the not yet successful companies in Section 4.

FIG 3-5A

Success Rates by Industry

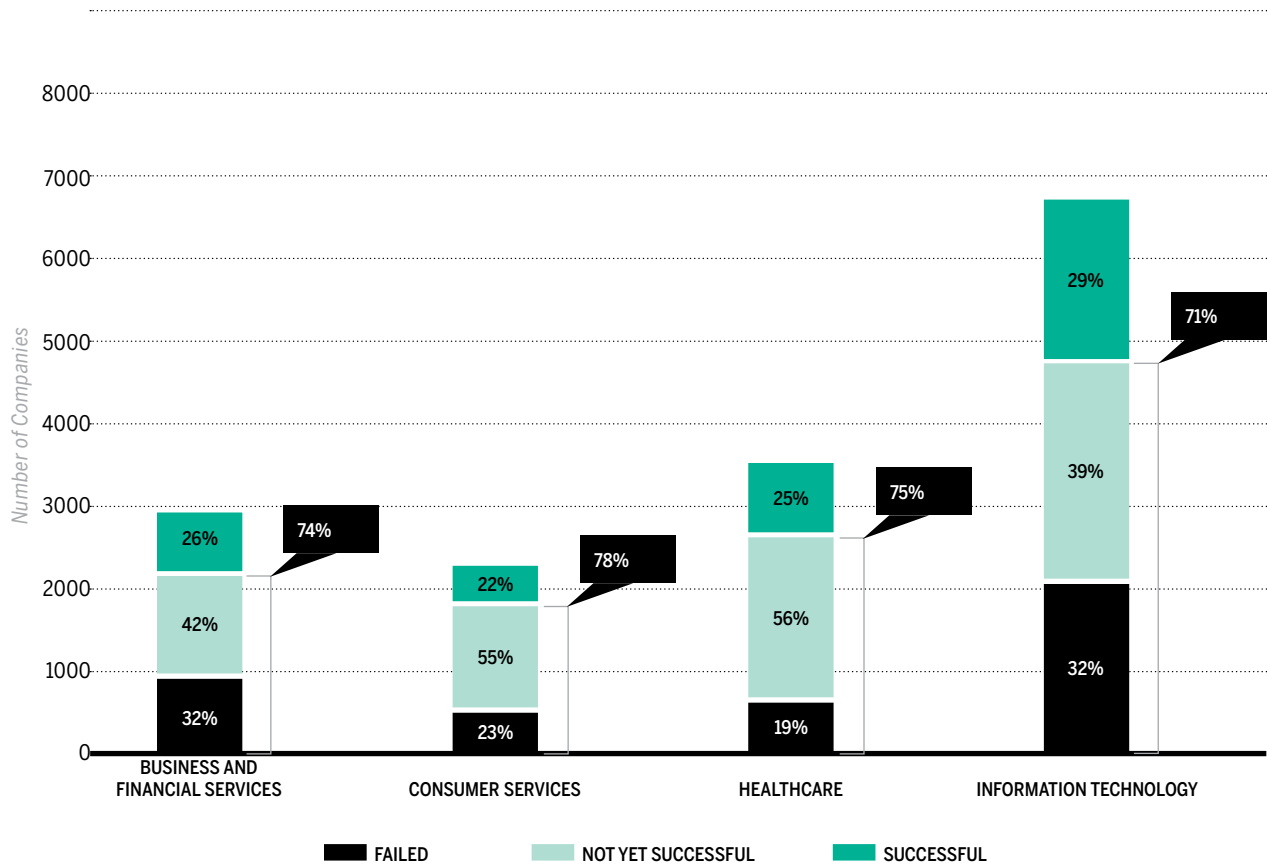
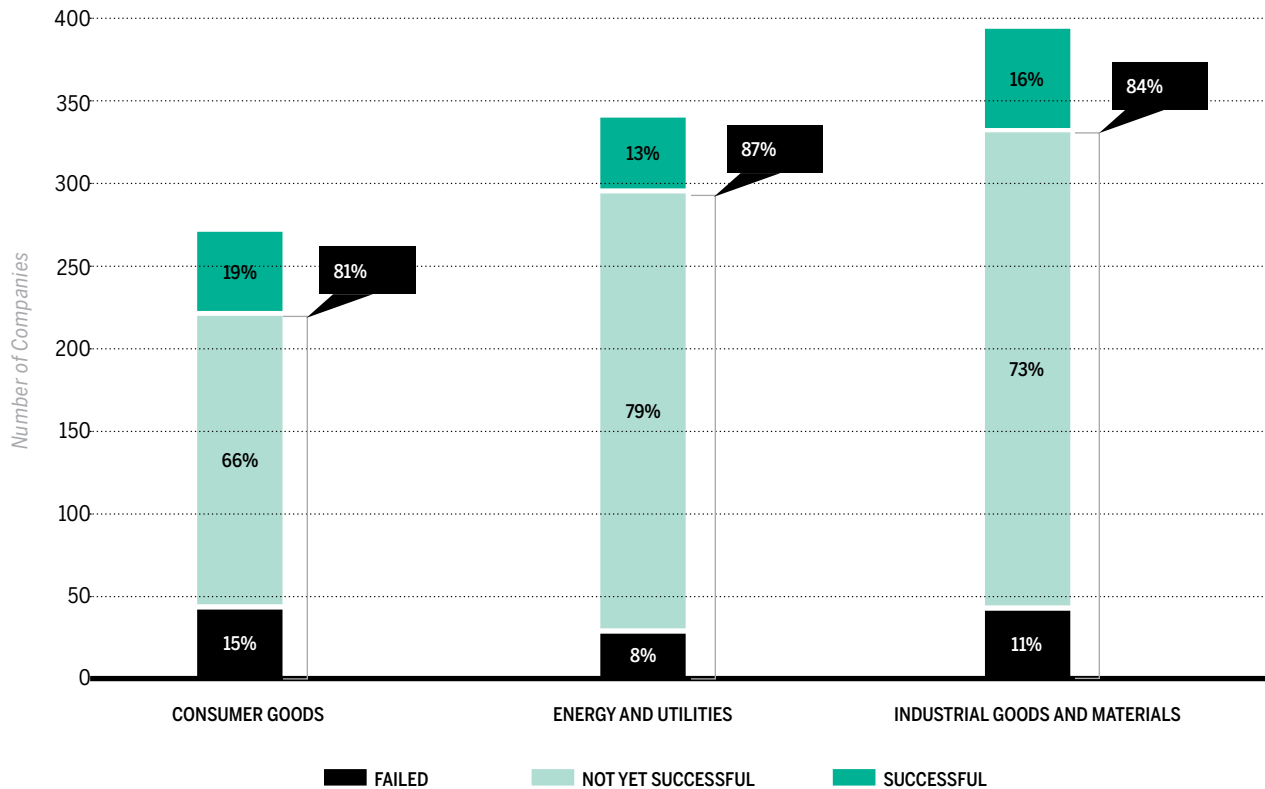


FIG 3-5B

Success Rates by Industry



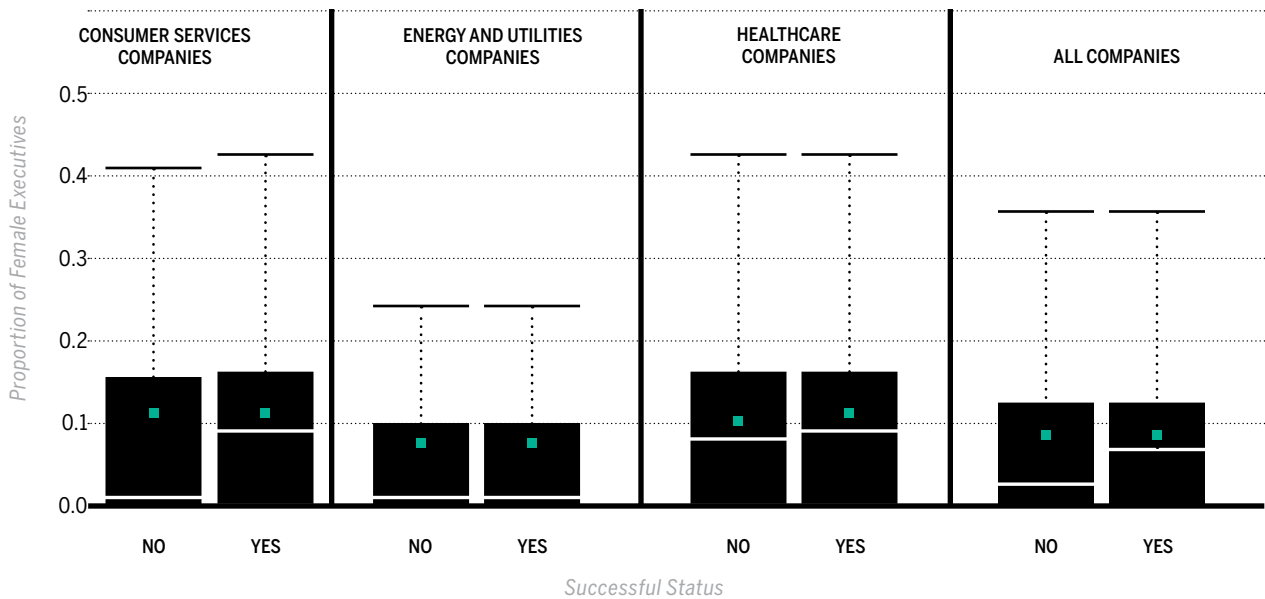
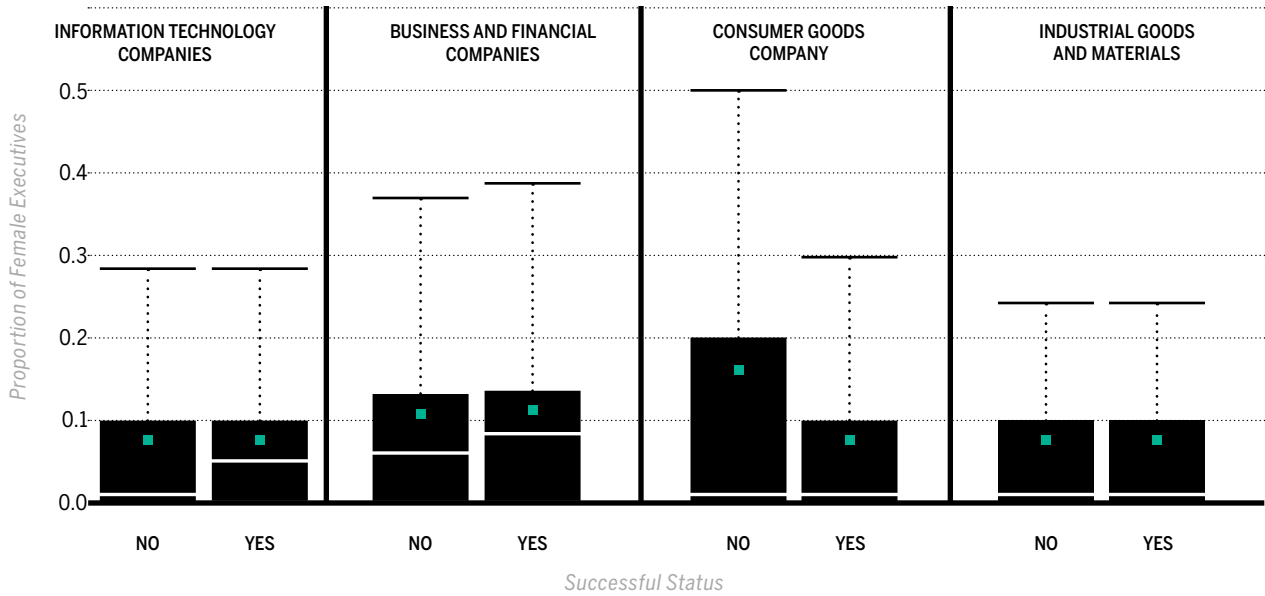
3.2.2 PROPORTION OF FEMALE EXECUTIVES IN SUCCESSFUL COMPANIES BY INDUSTRY

When we apply the Chi-Square test to check for dependence between companies with female executives and their success we encounter Simpson’s Paradox, one in which the observation for dependence differs when groups are combined versus split. We observe no dependency between success and having female executives at companies in the consumer goods and energy and utilities industries. Since Simpson’s Paradox arises from over-combining data, we conclude that **a relationship between companies with female executives and their success does exist, but it is conditional on the industry.**

From comparing the medians in the boxplots below, we see that companies in the information technology, business and financial services, consumer services, and healthcare industries have more female executives at successful companies than that of unsuccessful ones. The green dots represent averages and are shown above the medians, again suggesting that distributions are positively skewed. Confirming that data groups are not normally distributed, we again perform the Mann-Whitney-Wilcoxon test for each industry. The population medians of female executives at successful companies are significantly higher than those of unsuccessful companies in information technology, healthcare, consumer services, and business and financial services.

FIG 3-6

Overall Proportion of Female Executives by Ultimate Success of Company and Industry



WOMEN AT THE WHEEL: Do female executives drive start-up success?

Due to the data distribution within consumer goods, energy and utilities, and industrial goods and materials, we cannot conclusively say that the median proportion of successful companies is higher than unsuccessful

companies. This is primarily due to investment preferences within the venture capital industry, consequently resulting in smaller numbers of companies for those sectors.

3.3 Titles and Successful Companies

Only 6.5% of the privately held companies that received venture capital funding between 1997 and 2011 had a female CEO. Such a small percentage raises the question of whether a CEO's gender impacts the success of a company in some way, as well as the question of whether business conduct between genders affects the success of private companies. By the Chi-Square test of Independence, we see **there is a dependence between the success of a company and the existence of a female CEO.** However, there is no statistically significant dependency between a female founder and the success of the company.

Analyzing by industry group produces the same result for founders—the success of the company is independent of its having a female founder(s). However, grouping by industry and applying the Chi-Square test to exam dependency between the success status of a company having a female CEO, we see that our earlier conclusion exhibits Simpson's Paradox. There is only statistically significant dependency for companies in the consumer services industry.

Dependence should not be confused with causation. It merely means that a relationship between the two variables exists. Due to the relatively small number of female founders in the overall pool of companies (fewer than 1%), we were unable to analyze the dependence of female founders by industry. For those industries with sufficient data, none of them confirmed a dependence when the Chi-Square test was applied.

3.3.1 FEMALE EXECUTIVES AND PREDICTING THE SUCCESS OF THE START-UP

As we observed some dependency between female senior executives and the ultimate success of a company, we now take a closer look and apply regression analysis to the data. As previously mentioned, we measure success quantitatively for exited companies by exit ratios and qualitatively for privately held companies by their development stage (e.g., those that are profitable). In this section, we built a model to understand shifts in exit ratios (defined in Section 1.3 as exit valuation/total equity raised). To take into account the non-quantifiable privately held, profitable companies, we built a logistic regression model to predict the categorical dependent variable of ultimate success of the company by analyzing the changes in odds ratios of successful companies versus unsuccessful companies.

Before running any model, we find that the exit ratios are not normally distributed. To fit a linear model, we apply Box-Cox transformation on the exit ratios to have an approximately normally distributed dataset, tested by *qq plot*, a model assumption for testing regression. Our full model's predictors are companies with a female CEO, with a female founder, the proportion of female executives at five levels (C-level, VP-level, founder-level, director-level, and board member), the state in which the company is headquartered, and industry group. After running the model selection by AIC (Akaike Information Criterion) value, we come to our reduced model to regress exit ratio. Exit ratio is fit by a linear model of having a female CEO; proportion of females at board member, VP, and director level; interaction between proportion of female executives at VP and director level; year of exit; and industry group. By analysis of variance (ANOVA), the reduced model does not fit significantly differently from the full model. Therefore we fit the reduced model at an adjusted *R-square* of 0.22, meaning 22% of the variance can be explained by this model.

The statistically significant predictor for the exit ratio is the proportion of female board members, VPs, and directors; year of the exit; industry group; and female VP and director proportion interaction term, which is the multiplication of female VP and director proportions. Holding all other variables constant, we find that having a female CEO will slightly decrease the exit ratio of the company. Similarly, the exit ratio of a company slightly decreases with an increase in the proportion of female directors, VPs, or board members. However, not all merged or acquired companies have a calculable exit ratio since the valuation of many is not disclosed. Therefore, results are not definite for the entire industry. There also may be confounding variables excluded in the model. Further studies must be done to complete and validate

our conclusion regarding exit ratio. Given those limitations, we find that the Box-Cox transformed exit ratio of the company decreases by 0.22 if there is a female CEO, holding all other factors constant. The transformed ratio increases by 0.13 for every 0.1 increase in the interaction term of female VP and director proportion. The transformed exit ratio would decrease by 0.07, 0.05, and 0.06 for every 10% increase in female executives at the board member, VP, and director levels, respectively, if all other factors were held constant.

To predict ultimate success of the company, which is a binary categorical dependent variable of success or unsuccess, we apply logistic regression. In this study, a company's success can be regressed by statistically significant factors of having a female CEO, proportion of females at the VP and director level, and industry group. Looking at the statistically significant factors, particularly the ones related to female executives, **a company's odds of success increase with female executives at the VP and director levels.** With every 10% increase in female executives at the VP level and holding all other predictors constant, the odds of success (versus unsuccess) increase by 1.06 fold or 6%; for every 10% increase in female executives at the director level, the odds of success increase by 1.03 fold or 3.3%. Having a female CEO, with all other variables held constant, yields a 0.73 multiple odds of success, or a 0.24 decrease. By this model, the odds of success increase by 2% and 0.7%, respectively, for a 10% increase in C-level female executives and board members.

Thus, we see that having female executives positively helps VC-backed companies. Particularly at VP and director levels, the participation from female executives makes a significant difference in pushing a company to its success.

4 Success vs. Failed Companies

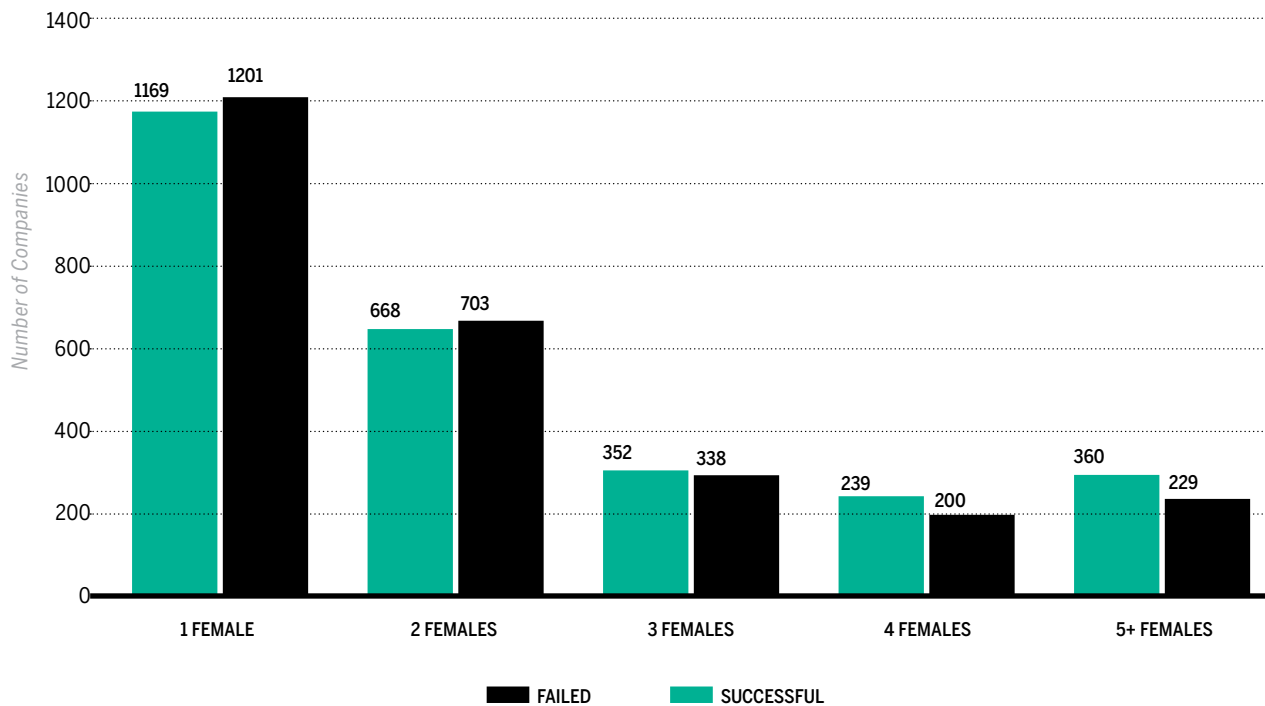
The previous section compared companies that achieved success with those that have not. However, it is important to separate those companies that have not achieved success into two categories: not yet successful and failed. (See Section 1.3.) Since the fortune of the former group is not definitive, they are excluded in this section of the analysis, which focuses solely on true success versus failure.

Of the 8,688 companies for which their success/failure was definitive, 49.7% achieved success (based on the above definition) and 50.3% failed.

While the overall median number of females at both successful and failed companies was two, Figure 4-1 shows that companies with only one or two female executives saw a higher number of failures, whereas those with three or four female executives had a slightly better chance of success. **For start-ups with five or more female executives, 61% were successful and only 39% failed.**

FIG 4-1

Overall Success Rates of Companies with Female Executives



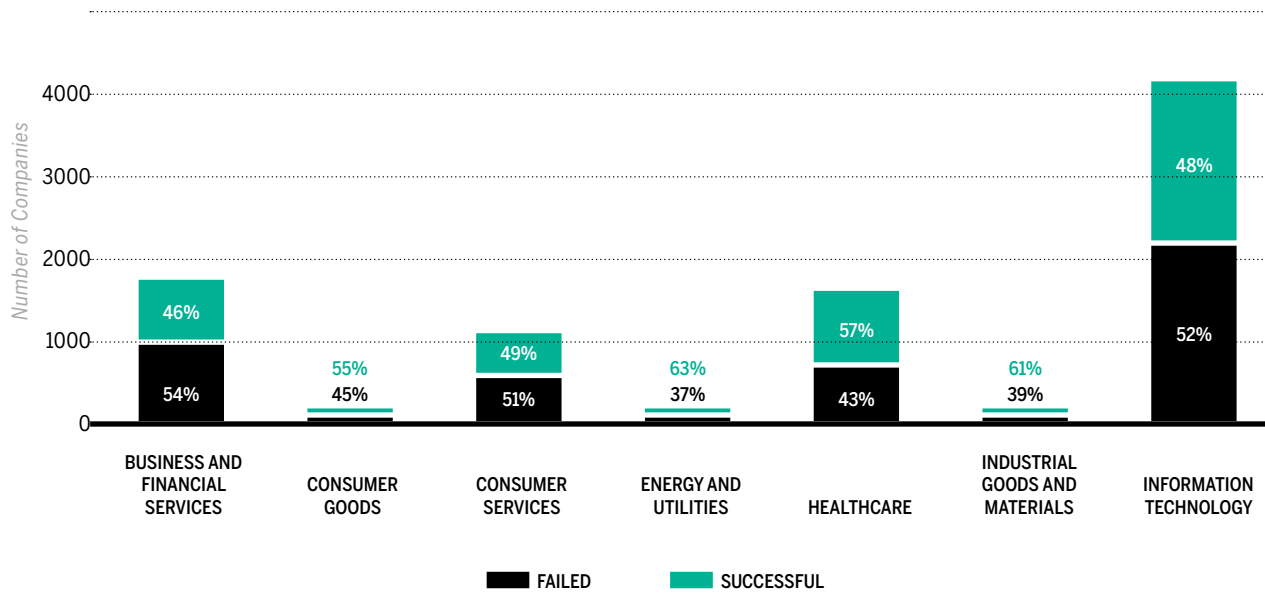
4.1 INDUSTRY ANALYSIS

With the varied nature of industries within venture capital, companies in some industries are bound to have higher success rates than others. While consumer goods, energy and utilities, and industrial goods and materials all have fewer companies than other industries, they all show positive success rates.

Of the industries with more than 1,000 companies (e.g., business and financial services, consumer services, healthcare, and IT), only healthcare has a positive success rate. Business and financial services and IT have seen the largest number of companies but also the highest failure rates.

FIG 4-2

Overall Success Rates of Companies by Industry

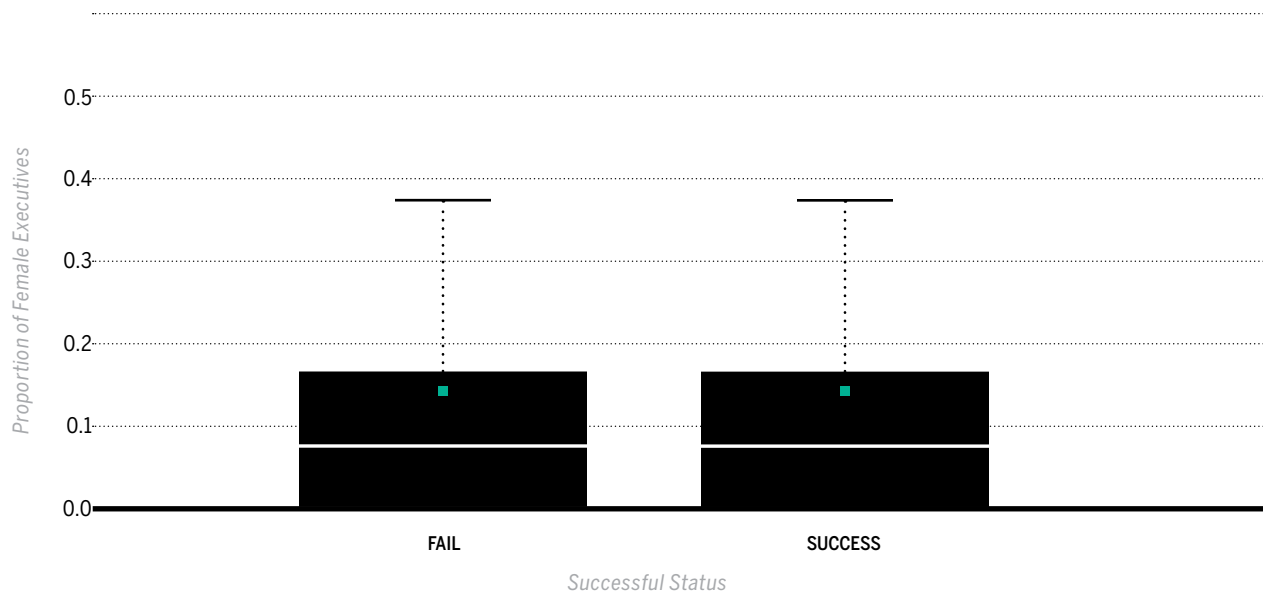


Again, there is not much disparity between a company's success and failure by its proportion of female executives, as shown from the boxplots below. The overall median proportion of female executives in successful companies is 7.1%, which is the same as the 7.1% median for failed companies. The medians,

averages, and overall distributions are very similar. Confirmed by the Mann-Whitney-Wilcoxon test, there is no statistically significant difference in the population median between female executives of successful and failed companies.

FIG 4-3

Proportion of Female Executives by Success



Through the Chi-Square test, we find there is a statistically significant dependence between having female executives and the success and failure of a

company. There also is a dependence between the survival of the company and having a female CEO, but no dependency for having a female founder.

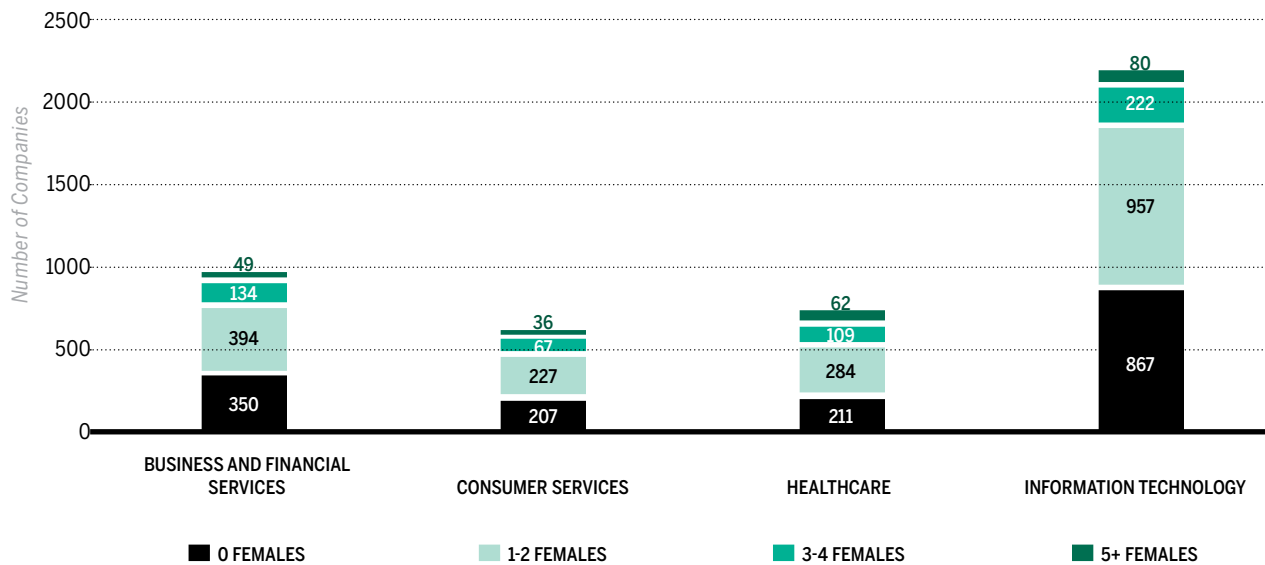
4.1.1 PROPORTION OF FEMALE EXECUTIVES IN FAILED COMPANIES BY INDUSTRY

Companies with female executives have played a large role in liquidity events as well as influenced failed companies in the industry. Looking at Figure 4-2 and the four industries with the greatest sample sizes (business and financial services, consumer services, healthcare, and IT), Figure 4-4 further isolates just the failed companies within those industries. Past trends suggest that companies with one to two female executives have failed more than those with zero females. However, within each of these industries, companies with three or more female executives have failed less.

healthcare, and IT), Figure 4-4 further isolates just the failed companies within those industries. Past trends suggest that companies with one to two female executives have failed more than those with zero females. However, within each of these industries, companies with three or more female executives have failed less.

FIG 4-4

Failed Companies by Industry and Female Presence

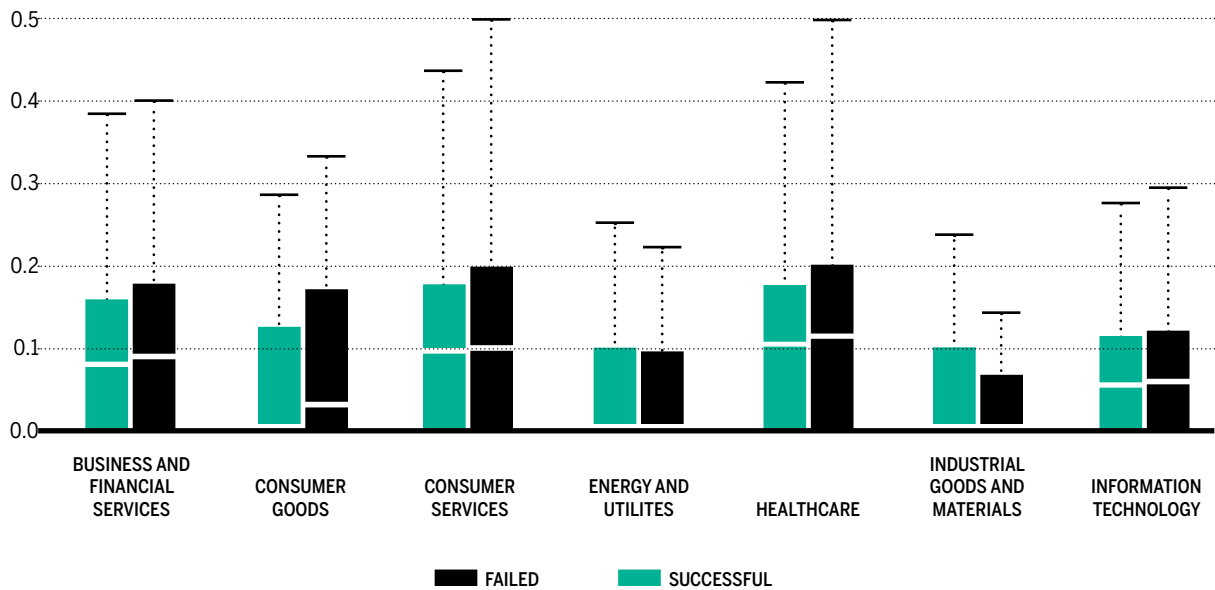


The boxplots in Figure 4-5 reveal no strong differences in the distribution of female executive proportions for successful and failed companies by industry. By the Chi-Square test, there is only dependence between a company having a female CEO and success for

those within the consumer services and IT industries. Across all industries, there is no statistically significant relationship detected for a company having female founders and its success.

FIG 4-5

Proportion of Female Executives by the Ultimate Success of the Company



When we change our logistic regression model to predict the odds ratio for successful companies versus failed companies, it finds several significant factors for modeling: having a female CEO, proportion of female executives at board member level, and industry group.

The odds ratio of successful companies compared to failed companies (holding all other variables constant) with a female founder, 10% hike in C-level female executives, or 10% hike in VP-level female executives, increases by 22%, 0.6%, and 0.7%, respectively.

5 Conclusion

Our hypotheses claimed that a higher proportion of female executives at venture-backed start-ups improves the ultimate success of the company. Using an extensive and comprehensive VentureSource dataset, we analyzed gender trends by numerous metrics and by industry: female-to-male ratio at privately held companies and exited companies; gender ratio by company development stage; proportion of female executives for successful, not yet successful, and failed companies; and title analyses. Our results yielded varied outcomes for these different layers of analysis. In some cases the female prevalence shows significance, while in others there is no dependence or simply not enough data to analyze.

With a wide gender gap among start-up teams and increased interest in illuminating this trend, our data brings color to this discussion. However, our analysis shows that the answers to the impending questions are not so black-and-white. It is commonly claimed that senior management teams initially have fewer females than males, but we see that companies begin to increase the female proportion once companies are further along in development. While females are less likely to head the founding of a company or to run operations during the formidable early years, they step in at the more stable threshold of generating revenue and hold mostly VP-level, C-level, or board member positions. Often at a later stage, the foundation and direction of the company have already been established, and changes may be too difficult to implement for immediate effects.

By industry, females have been more prevalent in the healthcare and business and financial services sectors, which raises the idea for exploring whether these industries play to their strengths, interests, and experience.

Recognizing the competitive nature of the VC industry and the “50-50” chance of success, companies and investors look for the advantage, and our analysis identifies the impact that female senior executives have had on a company’s fate. **In comparing successful versus unsuccessful companies, the overall median proportion of female executives is 7.1% and 3.1%, respectively, demonstrating the value that having more females can potentially bring to a management team. By industry, we identify the median proportion of female executives at successful companies as higher than that of unsuccessful companies in the IT, healthcare, consumer services, and business and financial services industries, which are the four largest sectors. We also see that a company’s odds for success (versus unsuccess) increase with more female executives at the VP and director levels.**

In the pool of successful companies versus failed companies, we do not see any significant difference between the proportion of female executives. However, a dependence exists between a company with a female CEO and its success within the consumer services and IT industries, the two industries that in the past five years saw the highest number of new companies enter the VC market.

Our analysis opens up a new set of questions on the gender gap and its impact on companies and the overall VC industry. Again, with our statistics, we have identified areas where trends/dependences exist or do not exist; we are not implying any causation. There are countless factors that one could test to further analyze a company’s success or the affect of females on a management team. However, based on this exclusive dataset and definitions of success, this report sheds light on the areas of greatest impact by females in the VC industry.

6 Appendix

FIG 6-1

VC-backed M&As by Companies with Female Executive(s)

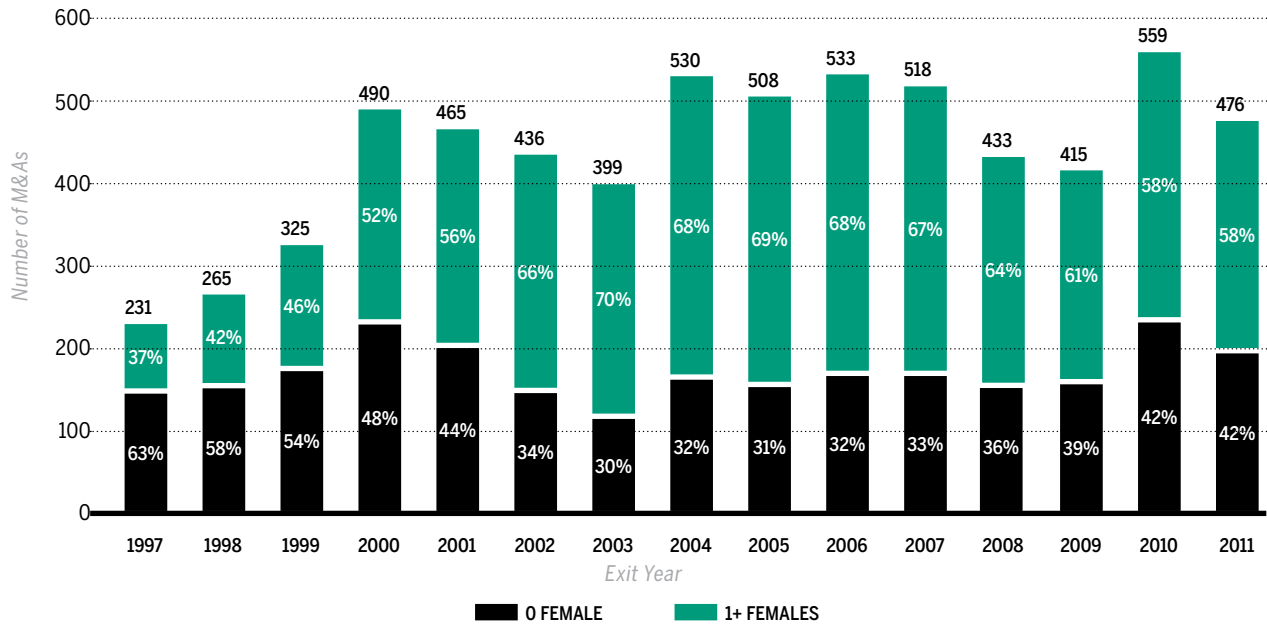


FIG 6-2

VC-backed IPOs by Companies with Female Executive(s)

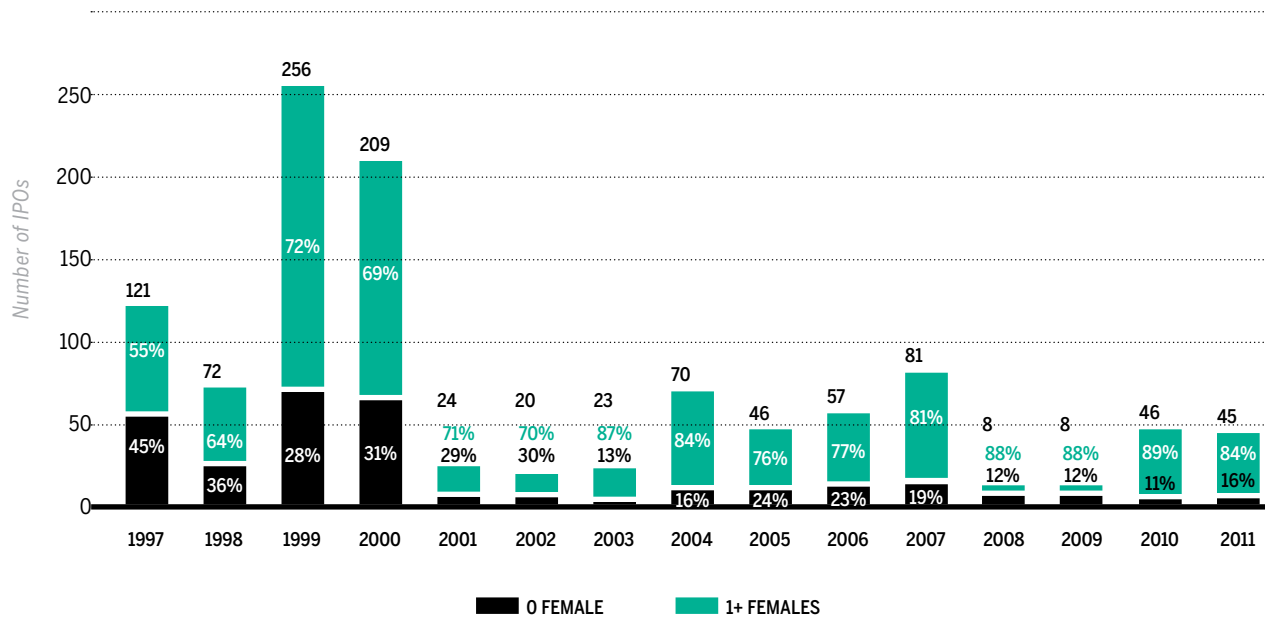
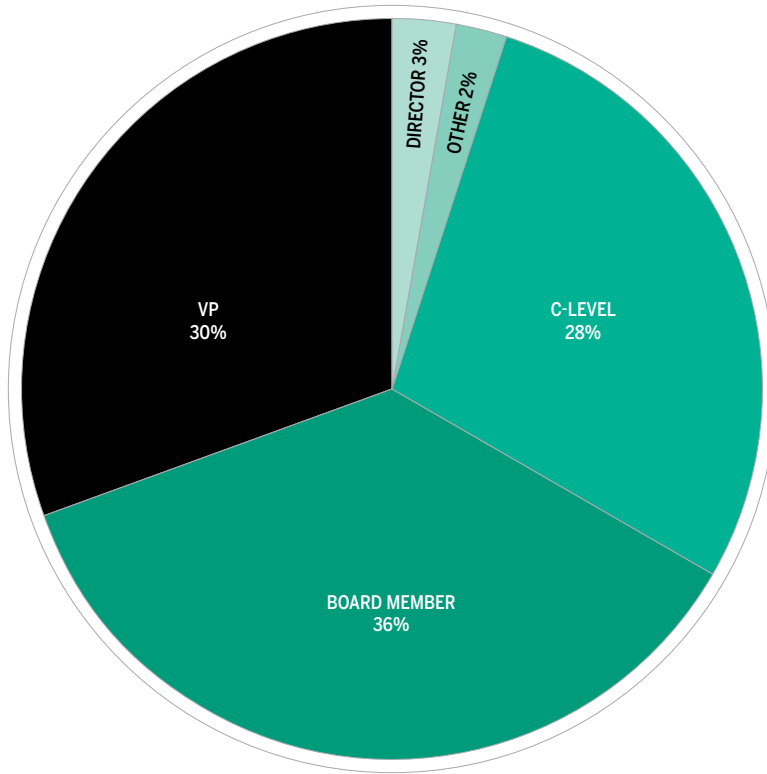


FIG 6-3

Male Title Breakdown for All Companies



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September 2012

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