Women-Owned Business Study
2019

Biz2Credit's 2019 Women-Owned Business Study is an annual review of the financial performance of women-owned small to mid sized companies in the United States. The Study reviews tens of thousands of credit inquiries and applications from small and mid sized businesses across the country for the full prior year (2018).

Results from the study are a trusted source of insight on the performance of women-owned private companies over the past 12 months. The Study is frequently cited in major publications covering finance and the American economy.
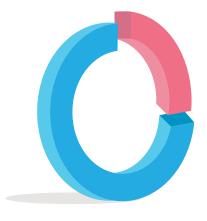
REPORT FINDINGS

As Revenue of Women-Owned Businesses Rose, Credit Scores Dropped in 2018.

The number of women-owned businesses that applied for funding in 2018 increased by 13 percent, although their funding amounts went down.

Report Methodology

Data Collection

The data set for the 2019 Women-Owned Business Study is comprised of **29471 completed credit applications** that were received through the Biz2Credit platform from January 2018 through December 2018. Based on the data collected, women-owned businesses were identified in around **8330 cases.**
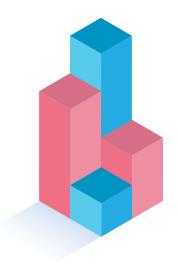

Data Preprocessing

We have used the Inter-Quartile Range to identify outliers and applied "Outlier Treatment with Capping Method."

Refer to the "2018 Data Preprocessing Methodology" section for more detail.

Data Analysis

Data from the study was tabulated into four different kinds of analysis in order to produce the results reported in the findings. Below is a summary of each of the analysis methods and its results.

1. Comparative Analysis on Women-owned and Non Women-owned businesses

In this study, we conducted a comparative analysis on Women-owned and Non Women-owned businesses based on following variables: annual revenue, operating expenses, age of business, personal credit score, funding rate and average loan size.

2. Industry-wide distribution for Women-owned and Non Women-owned businesses

Industry-specific analysis included the distribution of completed applications in 20 different industries for Women-owned and Non Women-owned Businesses in units, percentages and the difference in the two business types.

3. State-wise distribution for Women-owned and Non Women-owned businesses:

This includes the distribution of completed applications in the top 5 states identified for Women-owned and Non Women-owned Businesses in units and percentages and variance in the two business types. The top 5 states in the 2019 study were California, Texas, New York, Georgia and Ohio

For each state we have conducted a comparative analysis on business variables like annual revenue, operating expenses, age of business, personal credit score, funding rate and average loan size. Also, we analyzed industry-wide distribution on Women-owned and Non Women-owned businesses for each state.

4. Hypothesis testing using t-test:

We conducted a t-test on all 4 parameters for Women-owned businesses and non-women owned businesses in order to identify which variables were significant.

Based on the 2018 data used for producing the study, it was observed that Personal Credit Score, Operating Expenses and Age of Business all show statistically significant deviations from the expected mean. See Figure 1.

Year 2018: Comparision of Women-Owned Business vs Non-Women Owned Business								
Variables	test statistics			confidence Interval		sample estimates:		inference
	t-valve	df	p-value	95 percent		mean: non-women	mean: women	
Age of business	6.71	28133	1.97E-11	71	59	8	15	significant at 0.01%
Anual Revenue	1.60	201207	0.1097	-349360	3449148	$3,411,631	$1,861,737	significant at 11%
Personal credit score	23.90	16468	<2.2e-16	23	27	613	588	significant at 0.01%
Operating Expense	3.10	27924	0.00191	2613636	765894	$681,031	$3,014,455	significant at 1%

Figure 1

We also conducted a comparison of 2017 and 2018 results for women-owned companies and identified that there was not significant difference in the sample from 2017 and 2018. Please refer to Figure 2:

Comparision: 2017 vs 2018 Women-owned Business							
Variables	test statistics			confidence Interval		sample estimates:	
	t-valve	df	p-value	95 percent		mean: 2017	mean: 2018
Age of business	1.5664	15480	not significant	-1	5	62	59
Anual Revenue	-0.33389	15304	not significant	-2184165	1548362	$1,543,731	$1,861,633
Personal credit score	-0.58305	15115	not significant	-9	5	598	588
Operating Expense	-0.45237	10826	not significant	-648418	405251	$645,022	$766,605

Figure 2

5. Women-owned business vs Non Women-owned business: a statistical analysis

The average approved amount for women-owned businesses was **$43,534 compared to $69,268 for non women-owned businesses, a difference of 59%.** A further regression analysis was conducted to provide a statistical analysis and explanation for this gap.

The regression analysis was conducted on approved applications for which the business owner's gender was identified as Woman or Man (and N/A, Other). The dependent variable was the approved amount, while the explanatory variables were attributes of the application such as the age of the business, annual revenue, etc.

The factors found to be statistically significant were:

Explanatory factor	Direction	Significance level
Age of business	Positive	<10%
Annual revenue	Positive	<0.1%
New/returning customer	Negative	<0.1%
Operating expense	Negative	<0.1%
Personal credit score	Positive	<0.1%
BizAnalyzer score	Positive	<0.1%

Positive:

increasing the value of the explanatory factor increases the predicted approved amount

Negative:

increasing the value of the explanatory factor decreases the predicted approved amount

A comparison of average and median values of the explanatory factors between Women-owned and Non Women-owned businesses indicates that women-owned businesses showed values that differ from those of Non Women-owned businesses in ways that lower the approved amount of financing that is predicted. This is shown in the table below.

At Approved Level				
	WOB	NWOB	Difference	%Difference
Avg. Approved Amount	$43,543	$69,268	-25734	-59%
Avg. Ann Revenue	$666,657	$778,963	-112305	-17%
Median Ann Revenue	$432,901	$508,862	-75961	-18%
Avg. FICO	610	634	-25	-4%
Median FICO	624	648	-24	-4%
Avg. AOB	72	74	-1	-2%
Median	$319,250	$301,000	18250	6%
Avg. Initial BA Score	56	59	-3	-5%

The leading explanation for the differences observed between women-owned and non women-owned businesses is that these explanatory factors are leading to the lower average approval amounts for women-owned companies.

For example, a higher annual revenue of a business is statistically predicted to increase the approved amount; however, women-owned businesses that are approved have an average annual revenue of **$666,657 compared to $778,963** for **non women-owned businesses (median values are $432,901 vs. $508,862** respectively).

Likewise, a higher value of operating expenses is predicted to lower the approved amount: for women, the median operating expense is **$319,250 vs. $301,000 for non-women-owned businesses.** (Interestingly, this shows a discrepancy between the average operating expenses for all women-owned businesses and the operating expenses for women-owned businesses that were approved for financing.)

Thus, a significant portion of the approved amount gap between women-owned businesses and non-women-owned businesses can be traced back to the underlying operating and financial characteristics of the business, regardless of gender.

Additional statistical analysis will be conducted to fully identify the difference between the approval amount for women-owned business and Non women-owned business on variables such as the Amount Requested, Location of the business, and other factors.

Key findings:

- **Average earnings** (Annual Revenue- Operating Expenses) of women owned business rose to **$228,578 in 2018**, an improvement of **13%**.

- Applications for credit from women-owned businesses **increased by 13% in 2018** as compared to 2017.

- The **average credit score** for women dropped from 598 in 2017 to **588 in 2018** (not a statistically significant drop).

- Other services except public administration represented 19.7% of the women-owned companies in the study, the largest category of Businesses.

- The funding **acceptance rate for women-owned applicants was significantly higher** than the Non Women-owned Business.

- The average funded amount for **women-owned businesses ($48,341) was 31% less than** the same for **Non Women-owned businesses ($70,239) in 2018**. Initial indication is that business-related characteristics (like lower FICO, age of business, operating expenses)

Statistics: Women-owned vs. Non Women-owned Businesses

- Ratio of Women-owned Business to **Non Women-owned Business:** **28.3% (8334) vs 71.7% (21,137)** applications were recording on Biz2Credit.com in 2018. **An increase of 2% in Women-owned business application as compared to that of 2017**.

- The difference between average annual revenue of **Women-owned businesses ($228,578) and Non Women-owned ($473,157) widened by $2,843** when compared to the average revenue of 2017.

- Average Credit score: On an average the credit score for women-owned businesses **(588) were 25 points lower than Non Women-owned Businesses (613) in 2018**.

- Average age of Business (in months): The average age of business for Women-owned Business was 43 months, this was lower compared to the Non Women-owned Business (52 months) in 2018.

2018 Data Preprocessing Methodology:

The three most important variables considered in pre-processing were:

1.   Annual Revenue

2.   Operating Expenses

3.   Age of Business

In order to preprocess the data, we used the "Outlier Treatment with Capping Method" on the above parameters. For each variable we checked the outliers by using the Inter-Quartile Range at 25,75,90,95 and 99th percentile values.

Capping at Upper Limit was used on Annual Revenue and Operating Expenses, as there could be startup businesses included in the raw sample that have no reported annual revenue and no reported operating expenses, indicating that they did not operate any business during the year that could be validly analyzed for the purposes of the study based on the key variables considered.
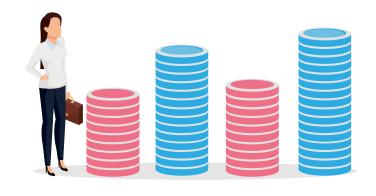
Upper Limit gave better results than any other percentile considered when comparing the 2018 data with prior years' reports.

$$\text{Outlier} = Q\_3 + 1.5*(Q\_3 - Q\_1)(\text{Only for Upper Limit})$$

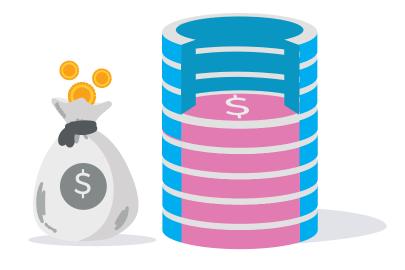*Refer to the "2018 Data Preprocessing Methodology" section for more detail.

1   Annual Revenue

Compared to previous year values, we opted to use **95th percentile value $3,234,528**. Averages of non-outlier cases were calculated based on data points below 95th percentile value and all values greater than or equal to $3,234,528 were replaced with the average of **non-outlier values i.e. $393,788.**

2 Operating Expense

Based on 2017 data, we opted to use **Upper Limit value of $1,392,051**. Averages of non-outliers were calculated based on the Upper Limit i.e. the average of all data points less than or **equal to$1,392,051** and all values greater then the Upper Limit were replaced with the average of **non-outliers i.e. $225,044**.

3 Age of Business

Comparing the previous year's values, we opted to use the 95th percentile value i.e. 252. We calculated the averages of non-outliers i.e. average of all data points below 252 and replaced all the values above 252 with the average of non-outliers value i.e. 50.

4 Credit Score

Credit Score is a variable that is reported by third parties. This **variable ranges** from **350-850**. For Credit Score, we calculated a simple average value (excluding zero which indicated that no score was reported) and for comparison testing we replaced zero with the average of non-zero values.

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