

WOMEN-OWNED BUSINESS STUDY 2020



Biz2Credit's 2020 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 (2019). 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.

■ DATA COLLECTION:

The data set for the 2020 Women-Owned Business Study is comprised of 40997 completed credit applications that were received through the Biz2Credit platform from January 2019 through December 2019. Based on the data collected, women-owned businesses were identified in around 11934 cases.

■ DATA PREPROCESSING:

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

*Refer to the “2019 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.



■ **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.

■ **Industry-wise 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.

■ **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 2020 study were California, Texas, New York, Georgia and Pennsylvania.

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.

■ **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 2020 data used for producing the study, it was observed that Personal Credit Score, Annual Revenue, Operating Expenses and Age of Business all show statistically significant deviations from the expected mean. See Figure 1.

Figure 1

Year: 2019 (Women Vs Non Women Owned business)							
	t-statistic	df	p-value	95% confidence interval	Women Owned business)		Result
					mean of women	mean of non women	
Operating expence	-10.273	45397	2.20E-16	[-655966.3, -445766.1]	362,036	912,902	Significant at 5% level of significance
Annual Revenue	-2.5557	70097	0.0106	[-1878103.1, -247739.8]	509,646	1,572,567	Significant at 5% level of significance
Personal CreditScore	-20.196	43536	2.20E-16	[-9.470384, -7.794821]	617	625	Significant at 5% level of significance
Age of Business months	-3.314	40949	0.00092	[-17.651274, -4.531643]	61	73	Significant at 5% level of significance

We also conducted a comparison of 2018 and 2019 results for women-owned companies and identified that there was not significant difference in the sample from 2018 and 2019 except Credit Score. Please refer to Figure 2:

Figure 2

Year: 2019 vs 2018 Women owned business							
	t-statistic	df	p-value	95% confidence interval	sample estimates:		Result
					mean of 2018	mean of 2019	
Operating expense	-0.023966	13641	0.9809	[-145231.5, 141723.0]	361,517	363,271	Significant at 5% level of significance
Annual Revenue	0.90509	11979	0.3654	[-1033213.3, 380461.1]	317,848	644,224	Significant at 5% level of significance
Personal CreditScore	4.2064	17102	0.000026	[1.585128, 4.351480]	618	616	Significant at 5% level of significance
Age of Business months	-1.0374	13116	0.2996	[-14.132611, 4.350355]	59	63	Significant at 5% level of significance

Women-owned business vs non-women-owned business:

a statistical analysis The average approved amount for women-owned businesses was \$42,478 compared to \$71,504 for non-women-owned businesses, a difference of 41%. 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	<0.1%
Annual revenue	Positive	<0.1%
New/returning customer	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.

	Gender flag	Non Women	Women	Overall
Median	AGE of BUSINESS(MONTHS)	66	62	62
	Approved Ammount	\$ 25,000.00	\$ 20,000.00	\$ 25,000.00
	Approved BA	58	54	57
	Approved Credit Score	655	629	647
	Approved Annual Revenue	\$769,832.00	\$ 518,577.00	\$ 695,904.00
	Approved OE	\$ 600,000.00	\$ 405,057.00	\$ 528,154.50
Mean	AGE of BUSINESS(MONTHS)	107	97	104
	Approved Ammount	\$72,783.66	\$ 44,130.29	\$ 64,492.29
	Approved BA	57	55	56
	Approved Credit Score	631	615	626
	Approved Annual Revenue	\$ 8,077,833.69	\$ 1,262,800.20	\$ 6,105,781.29
	Approved OE	\$ 2,788,327.12	\$ 1,085,568.67	\$ 2,295,603.37

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 \$1,262,800.20 compared to \$ 8,077,833.69 for non-women-owned businesses (median values are \$518,577.00 vs. \$769,832.00 respectively).

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 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 has insignificant drop to **\$107,804.24** in 2019 from **\$111,820** in 2018.
- Applications for credit from women-owned businesses increased by **43%** in 2019 as compared to 2018.
- The average credit score for women increased from **588** in 2018 to 590 in 2019 (not a statistically significant increase).
- Other services except public administration represented **24.4%** of the women-owned companies in the study, the largest category of Businesses.
- The funding acceptance rate for non-women-owned applicants was significantly higher than the Women-owned Business.

The average funded amount for women-owned businesses (\$40,513) was 41.78% less than the same for Non-Women-owned businesses (\$69,596) in 2019. Initial indication is that business-related characteristics (like lower FICO, age of business, operating expenses) played an important role in creating this difference and not Gender.

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

- Ratio of Women-owned Business to Non-Women-owned Business: **29.11%** (11934) vs **70.89%** (29063) applications were recorded on Biz2Credit.com in 2019. An increase of **43%** in Women-owned business application as compared to that of 2018.
- The difference between average annual revenue of Women-owned businesses (\$384,359) and Non-Women-owned (\$752,154) in 2019 widened by **\$367,795** when compared to the average revenue of 2018 which was **\$244,579**.
- Average Credit score: On an average the credit score for women-owned businesses (590) was 23 points lower than Non-Women-owned Businesses (613) in 2019.
- Average age of Business (in months): The average age of business for Women-owned Business was 48 months, this was lower compared to the Non-Women-owned Business (57 months) in 2019.



2019 Data Preprocessing Methodology:

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

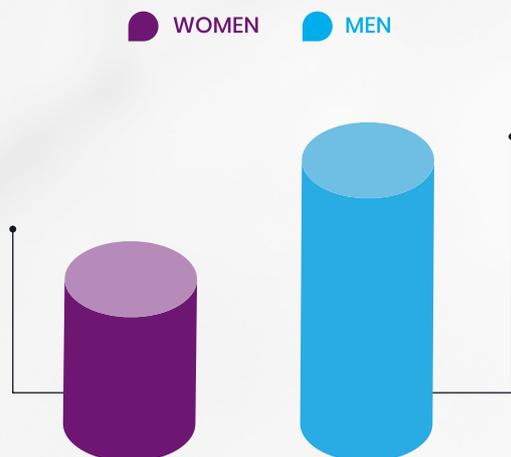
1. Annual Revenue
2. Operating Expenses
3. Age of Business
4. Personal Credit Score

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 95th percentile was used on Annual Revenue, 90th percentile on 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.

Annual Revenue

Compared to previous year values, we opted to use 95th percentile value **\$4,638,697**. Averages of non-outlier cases were calculated based on data points below 95th percentile value and all values greater than or equal to **\$4,638,697** were replaced with the average of non-outlier values i.e. **\$384,359**.



Operating Expense

Based on data, we opted to use **90% ile** with value **\$2,089,607**. Averages of non-outliers were calculated based on the 90% ile i.e. the average of all data points less than or equal to **\$2,089,607** and all values greater than the 90%ile were replaced with the average of non-outliers i.e. **\$276,554**.



Age of Business

Comparing the previous year's values, we opted to use the **99%ile** value i.e. 455. We calculated the averages of non-outliers i.e. average of all data points below 455 and replaced all the values above 455 with the average of non-outliers' value i.e. **54.6**

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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