

Introduction

This statistical report seeks to describe and summarize the data of stocks listed in the US stock market containing firm information in December 2020. A random sample selection of four hundred (400) companies from this dataset has been made for further analysis (see Appendix 1). This analysis will be used to identify the statistical factors affecting these stocks and give recommendations for investors in the U.S. stock market. Depersio (2021) explained random sampling as a method used to cull a smaller sample size from a larger population. The random sampling method poses a limitation to the results of this report. The total population of the dataset for December 2020 was 2675 firms but only 400 firms were randomly sampled for the purpose of this report. Hence, there is no guarantee that the findings are reflective of the population as a whole.

Body of Report

1. Variables and Scales of Measurement

Inferring from the data provided in the sample, a number of variables and their types and scales of measurement can be identified. Bevans (2021) suggests that a variable is an attribute of an object of study. The variables are the characteristics of the firms that this study focuses on based on the sample and includes the stock exchanges, firm size, stock return, past return, trading volume and the industry that these firms operate in. These variables are characterized by nominal and ratio scales of measurement.

Nominal variables include those with labels and used to identify an attribute of the firm. An example in this case is the stock exchange with 1 representing the NYSE and 2 for AMEX, etc. The ratio variables include those of which the ratio of two values is meaningful. An example

is the stock return in December 2020 for Arlo Technologies Inc. of 48% which represents an increase of 166.67% from the 18% of November 2020.

The data presented in this case study is cross sectional. Cherry (2019) indicated that, cross sectional data involves looking at data from a population at one specific point in time and it focuses on several variables.

2. Graphical & Tabular Representations of Research Variables

2.1 Descriptive Statistics of Stock Return and Firm Size

Table 1 illustrates a summary of the descriptive statistics on stock return and firm size under measures of central location including mean, mode and median and measures of variability including range, variance and standard deviation.

Table 1: Summary of Descriptive Statistics on Stock Return and Firm Size

	Measures of Central Location			Measures of Variability		
	Mean	Mode	Median	Range	Variance	Standard Dev.
Stock Return	12%	8%	6%	432%	9%	30%
Firm Size (\$M)	15,585	N/A	1,298	527,447	2,328,718,697	48,257

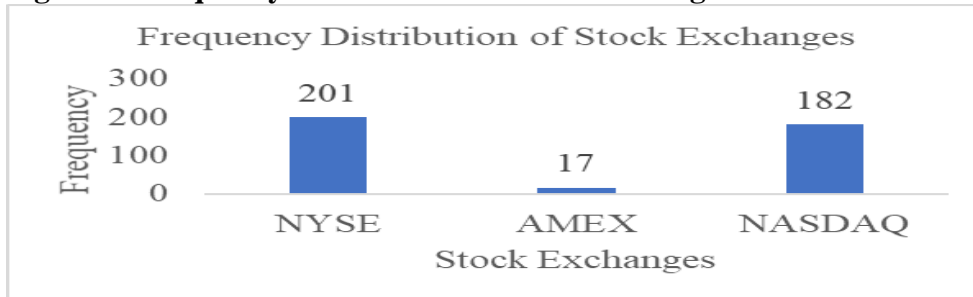
Source: Dataset on firm information for Dec. 2020

As illustrated in Table 1, the mean stock return and firm size is 12% and \$15,585m respectively. The modal stock return was 8% while there was no modal reference for firm size. The median stock return and firm size were 6% and \$1,298m respectively. Also, the range of the sample stock returns and firm size were 432% and \$527,447m respectively. The variance of stock returns and firm size were 9% and \$2,328,718,697m respectively and the standard deviation of stock returns and firm size were 30% and \$48,257m respectively.

2.2 Frequency Distributions of Stock Exchanges and Industries

Figures 1 and 2 below shows the frequency distributions of stock exchanges and the industries that the sample companies operate in.

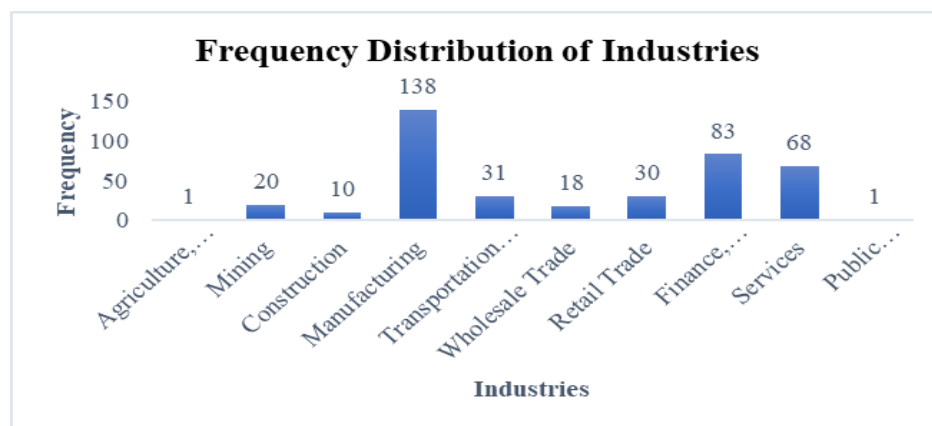
Figure 1: Frequency Distribution of Stock Exchange



Source: Dataset on firm information for Dec. 2020

Figure 1 shows that NYSE recorded the highest stock listings (201) of the sample firms.

Figure 2: Frequency Distribution of Industries



Source: Dataset on firm information for Dec. 2020

Figure 2 shows the manufacturing industry was most populated by the sample firms.

2.3 Illustration of Stock Exchange & Industries with their Average Stock Return

Tables 2 & 3 provide joint information on stock exchanges, different industries and their respective average stock returns.

Table 2: Stock exchanges and average stock return

Stock Exchange	Average Stock Return
NYSE	10%
AMEX	45%
NASDAQ	11%

Source: Dataset on firm information for Dec. 2020

Table 2 shows that AMEX stock exchange had the highest average stock return of 45%.

Table 3: Industries and average stock return

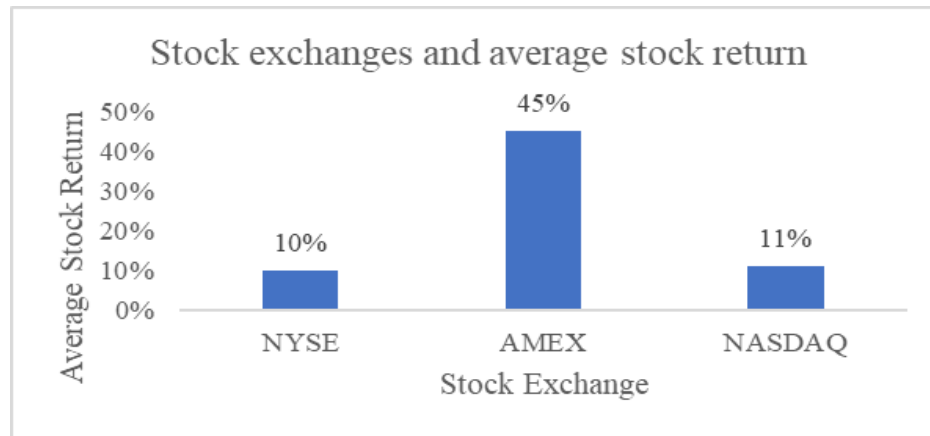
Industries	Average Stock Return
Agriculture, Forestry and Fishing	8%
Mining	25%
Construction	13%
Manufacturing	10%
Transportation, Communications, Electric, Gas and Sanitary service	7%
Wholesale Trade	5%
Retail Trade	5%
Finance, Insurance and Real Estate	9%
Services	22%
Public Administration	2%

Source: Dataset on firm information for Dec. 2020

Table 3 shows that the mining industry recorded the highest average stock return of 25%.

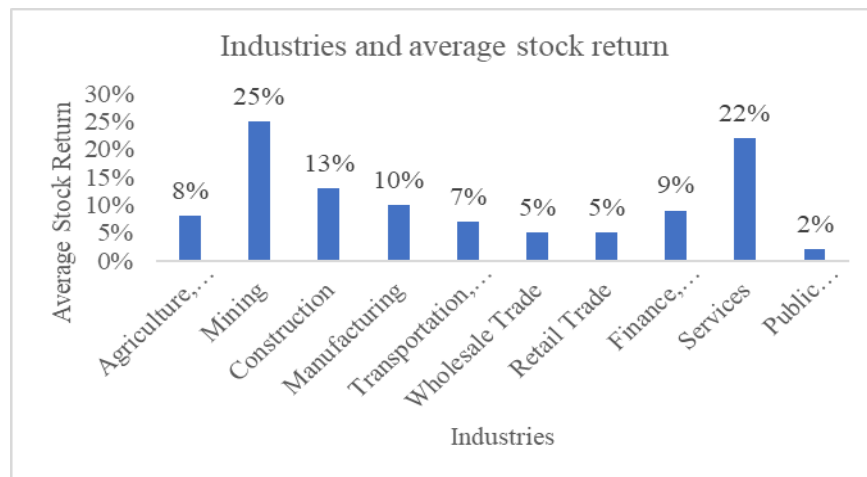
Figure 3 and 4 provides graphical demonstrations of the information in Tables 2 and 3.

Figure 3: Stock exchanges and average stock return



Source: Dataset on firm information for Dec. 2020

Figure 4: Industries and average stock return

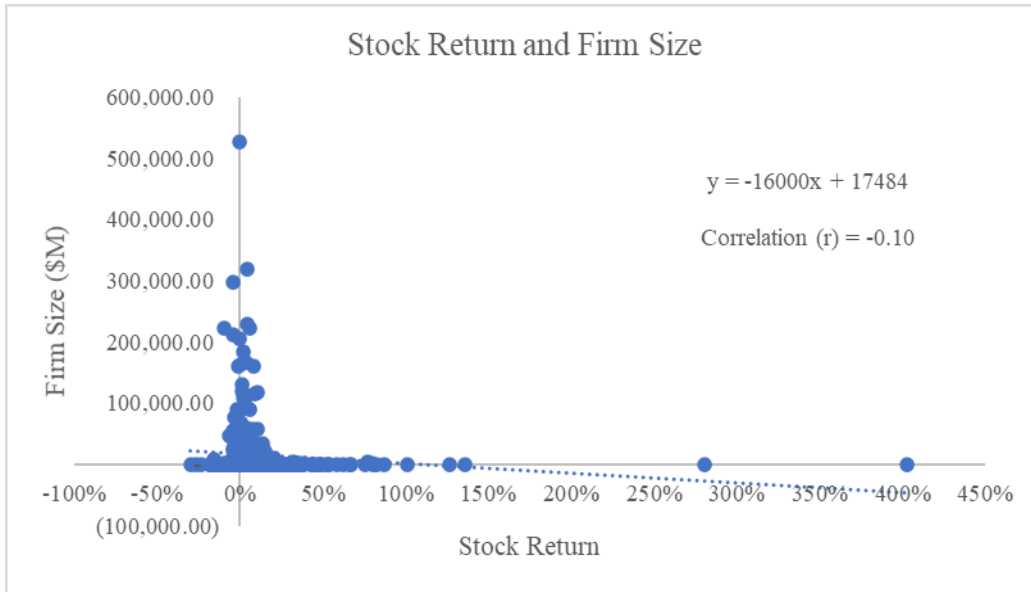


Source: Dataset on firm information for Dec. 2020

2.4 Scatter Plot and Correlation Analysis

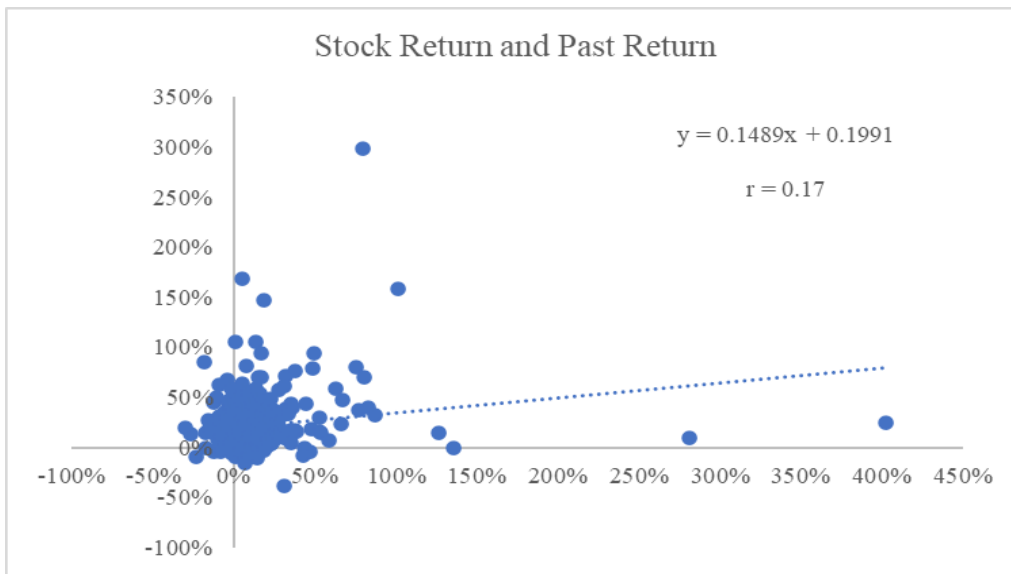
Yi (2019) indicated that a scatter plot is a type of chart that is used to visually observe the relationship between two variables. These scatter plots are illustrated with the sample data below:

Figure 5: Scatter plot of stock return and firm size

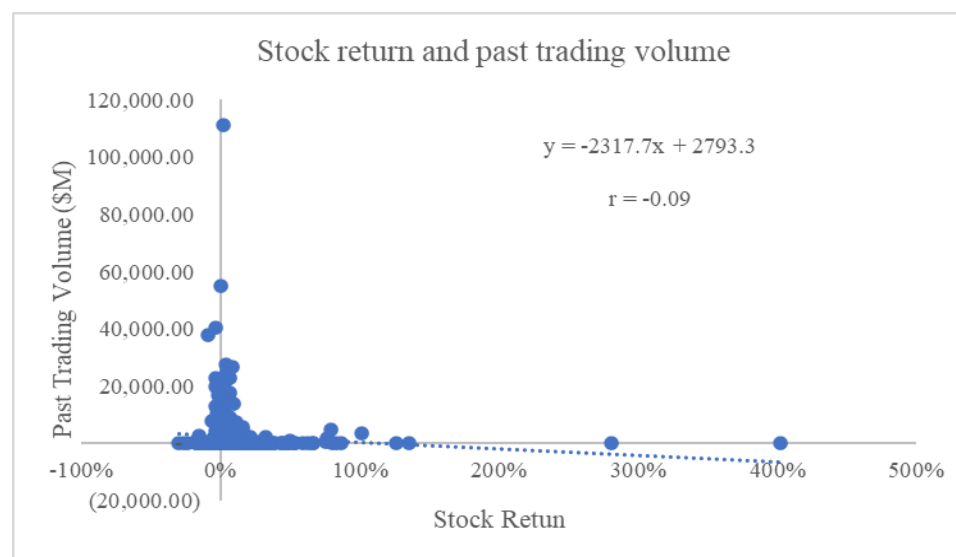


Source: Dataset on firm information for Dec. 2020

Figure 6: Scatter plot of stock return and past return



Source: Dataset on firm information for Dec. 2020

Figure 7: Scatter plot of stock return and past trading volume.

Source: Dataset on firm information for Dec. 2020

The insights gained from the scatter plots in Figures 5, 6 and 7 revealed that there existed a weak correlation of stock returns with firms' size, past returns and past trading volume with correlations of -0.10, 0.17 and -0.09 respectively.

This analysis can provide recommendations to investors in the U.S. to favour the NYSE as it recorded the highest stock listings and thus indicate higher trading volumes. Investors can also recognize the mining industry as very lucrative as it recorded the highest average stock return of 25%.

Conclusion

This report has described and summarized the data of 400 randomly selected firms listed in US stock markets including NYSE, AMEX and NASDAQ. The report utilized the information from the dataset of firms for December 2020 and the case questions have been adequately tackled through the presentation of graphical and tabular information with their accompanying

analysis. It was identified that the mean stock return and firm size is 12% and \$15,585m respectively. Also, NYSE recorded the highest stock listings (201) of the sample firms and the manufacturing industry was the most populated by firms. Further, it was determined that AMEX had the highest average stock return of 45% with the mining industry recording the highest average stock return of 25%. Finally, it was revealed that there existed a weak correlation of stock returns with firms' size, past returns and past trading volume with correlations of -0.10, 0.17 and -0.09 respectively.

References

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- Yi, M. (2019, October 16). *A complete guide to scatter plots*. Chartio. <https://chartio.com/learn/charts/what-is-a-scatter-plot/>

Appendix 1.

Random	Company name	Exchange	Stock return	Firm size	Past return	Past trading volume	Industry name
0.479883724	ARLO TECHNOLOGIES INC	NYSE	48.0989	415.7346	17.9372	98.0801	Manufacturing
0.12611768	ABBVIE INC	NYSE	2.4574	184633.2742	22.8907	21144.8005	Manufacturing
0.910576103	TYSON FOODS INC	NYSE	-1.1656	19177.0143	14.7038	3470.0612	Manufacturing
0.310905166	S P X FLOW INC	NYSE	8.1747	2261.8262	26.5171	175.9996	Manufacturing
0.520760855	CYTOKINETICS INC	NASDAQ	23.6905	1189.0871	9.3038	370.2888	Manufacturing
0.772331972	TAKUNG ART CO LTD	AMEX	33.3333	12.5108	7.7670	0.5179	Manufacturing
0.995474309	AIR T INC	NASDAQ	126.3636	31.7020	14.0641	0.6347	Transportation, Comm.
0.983401188	LENNAR CORP	NYSE	0.4877	20870.2999	8.0165	3980.0860	Construction
0.011457477	VALUE LINE INC	NASDAQ	19.9345	264.1514	0.6960	2.6803	Manufacturing
0.926065848	CANCER GENETICS INC	NASDAQ	6.9498	10.5542	15.1111	9.1590	Services
0.573024032	MOLSON COORS BEVERAGE CO	NYSE	16.1111	285.4440	11.3861	0.1512	Manufacturing
0.906250766	ORGANOVO HOLDINGS INC	NASDAQ	43.8596	57.5586	-0.3496	16.0124	Finance, Insurance and Real Estate
0.794177025	P N C FINANCIAL SERVICES GRP INC	NYSE	7.9163	58500.4002	23.4090	8011.8712	Finance, Insurance and Real Estate
0.435481977	VOCERA COMMUNICATIONS INC	NYSE	22.7609	1099.2382	3.2032	155.7973	Manufacturing
0.410844095	HOOKER FURNITURE CORP	NASDAQ	7.1358	359.8195	10.0727	26.0504	Manufacturing
0.54102136	ASHLAND GLOBAL HOLDINGS INC	NYSE	5.3612	4553.7233	8.1339	811.9487	Wholesale Trade
0.71367802	MICROSTRATEGY INC	NASDAQ	13.3559	2486.1107	105.1655	2400.0412	Services
0.961440509	HAIN CELESTIAL GROUP INC	NASDAQ	4.2857	3874.5245	25.2033	646.7461	Manufacturing
0.274728894	C V S HEALTH CORP	NYSE	0.7523	88731.2135	20.8593	15417.3850	Retail Trade
0.329457485	AEROCENTURY CORP	AMEX	402.3364	3.3084	24.4186	0.9910	Services
0.010731472	A C I WORLDWIDE INC	NASDAQ	17.9558	3804.1062	11.6901	678.2277	Services
0.489172539	MANNING & NAPIER INC	NYSE	35.4212	76.3533	17.5127	3.9485	Finance, Insurance and Real Estate
0.266784675	LENNAR CORP	NYSE	0.8237	2283.5947	6.6971	105.6119	Construction
0.439051173	ALBEMARLE CORP	NYSE	8.7777	14474.9584	45.8749	3710.8389	Manufacturing
0.702069686	CARS COM INC	NYSE	1.1638	752.7016	51.1502	249.3837	Wholesale Trade
0.636699199	ONCOCYTE CORP	AMEX	23.8342	129.7944	30.4054	16.0146	Services
0.744479002	VOXX INTERNATIONAL CORP	NASDAQ	-0.8547	278.7256	13.5922	67.6615	Wholesale Trade
0.596325761	BROWN & BROWN INC	NYSE	5.2854	12791.1764	3.7060	840.5750	Finance, Insurance and Real Estate
0.360463522	ANIXA BIOSCIENCES INC	NASDAQ	16.2879	62.8030	28.1553	7.3133	Manufacturing
0.266130686	MANPOWERGROUP	NYSE	4.0739	4985.2345	29.3944	1073.6628	Services
0.901224902	MAYS J W INC	NASDAQ	-1.2235	46.1362	-5.8618	0.0343	Finance, Insurance and Real Estate
0.594384696	LEAF GROUP LTD	NYSE	-17.5532	154.4796	-1.0526	17.1490	Services
0.356652581	CABLE ONE INC	NYSE	12.4730	11933.5370	14.5110	1336.3581	Transportation, Communications, Elect
0.368148393	AMERICAN FINANCIAL GROUP INC NEW	NYSE	0.2349	7764.7224	19.3088	812.9515	Finance, Insurance and Real Estate
0.160786222	DISCOVERY INC	NASDAQ	9.0341	7786.6356	31.1135	1301.4156	Transportation, Communications, Elect
0.43239145	MOTOROLA SOLUTIONS INC	NYSE	-0.4431	29078.2800	8.5221	2970.0762	Manufacturing
0.382457662	MCCORMICK & CO INC	NYSE	4.2500	1667.7760	2.9371	1.5272	Manufacturing
0.594012385	BORGWARNER INC	NYSE	-0.5405	9499.5628	11.5495	2089.5277	Manufacturing
0.751452498	OMEGA FLEX INC	NASDAQ	3.2176	1430.5217	-5.3307	26.6717	Manufacturing
0.949512943	ONCOSEC MEDICAL INC	NASDAQ	24.0385	145.4128	37.2032	44.2088	Services
0.772368062	SANTANDER CONSUMER USA HLDGS INC	NYSE	-0.3620	6764.1692	8.6529	164.1102	Finance, Insurance and Real Estate
0.411247347	GANNETT CO INC	NYSE	18.3099	391.8035	146.9565	159.8804	Manufacturing
0.999806928	POWELL INDUSTRIES INC	NASDAQ	14.1696	300.0413	10.4105	36.3841	Manufacturing
0.769564813	CBDMD INC	AMEX	-1.9934	156.8391	46.8293	53.4958	Services
0.634849705	DISCOVERY INC	NASDAQ	0.4651	210.0120	-5.8394	1.1675	Transportation, Communications, Elect
0.611536432	HUMANA INC	NYSE	2.5904	53005.2159	0.3106	7488.9628	Finance, Insurance and Real Estate
0.056155973	DELL TECHNOLOGIES INC	NYSE	6.1712	17986.8707	14.5536	2283.5607	Manufacturing
0.504590398	CALIFORNIA WATER SERVICE GROUP	NYSE	9.1956	2466.0832	11.4932	209.3647	Transportation, Communications, Elect
0.187841649	IRIDEX CORP	NASDAQ	46.7836	23.7656	-3.9326	3.2894	Manufacturing
0.471442198	EVENTBRITE INC	NYSE	7.9308	1145.0892	81.6902	613.0173	Services

Source: Dataset on firm information for Dec. 2020

NB: Appendix has been shortened due to the extensive list of data. However, the full four hundred (400) sample size of firms was used for analysis in Microsoft Excel for the whole report.