Calculating and Analyzing Beta Using Fama-Franche 3 Factors

Company: Starbucks Corporation (SBUX)

Figure 1: Pre-pandemic Regression Output (January 1, 2015 - December 31, 2019)

Source: FactSet

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.420861708
R Square	0.177124577
Adjusted R Square	0.133041965
Standard Error	0.049727091
Observations	60

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	0.029807041	0.00993568	4.01801457	0.011659015
Residual	56	0.13847588	0.002472784		
Total	59	0.168282922			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.007072918	0.006716869	1.053008184	0.296859709	-0.006382587	0.020528422	-0.006382587	0.020528422
X Variable 1	0.592432637	0.187935203	3.152323918	0.002602041	0.215953185	0.968912089	0.215953185	0.968912089
X Variable 2	-0.544065982	0.28370548	-1.917714039	0.060252623	-1.112396351	0.024264388	-1.112396351	0.024264388
X Variable 3	-0.191546215	0.249433369	-0.767925382	0.445757644	-0.691221297	0.308128866	-0.691221297	0.308128866

Starbucks Corporation (SBUX)

From the calculation: Pre-pandemic period

Mkt-RF = 0.592432637 , SMB = -0.544065982 & HML = -0.191546215

Observations:

- **Mkt-RF (market factor) of 0.5924** suggests that the company's stock return is expected to move by roughly 0.59% in the same direction for every 1% change in the market excess return. The company's returns were somewhat in line with general market trends before the pandemic, according to this positive coefficient.

- The negative coefficient **SMB (Small Minus Big) = -0.5441** implies that the company behaved more like a large-cap stock, as larger companies are typically less sensitive to the SMB effect. A 1% increase in the SMB factor, which favors small-cap firms, results in a 0.54% decrease in the company's performance.

- The negative **HML (High Minus Low) coefficient of -0.1915** indicates that the company's returns were more consistent with growth equities than value stocks prior to the pandemic. A 1% increase in the HML factor, which favors value equities, results in a 0.19% decrease in the company's performance.

Figure 2: During Pandemic Regression Output (January 01, 2020 - May 31, 2023)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.70574758
R Square	0.498079647
Adjusted R Square	0.457383402
Standard Error	0.064143407
Observations	41

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	0.151067055	0.050355685	12.23895839	1.03731E-05
Residual	37	0.152231937	0.004114377		
Total	40	0.303298993			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.000258548	0.010115419	-0.025559826	0.979745789	-0.020754334	0.020237237	-0.020754334	0.020237237
X Variable 1	1.037194752	0.174268633	5.951700737	7.29917E-07	0.684092961	1.390296543	0.684092961	1.390296543
X Variable 2	-0.160284075	0.338369495	-0.473695404	0.638500386	-0.845885795	0.525317645	-0.845885795	0.525317645
X Variable 3	0.027923306	0.189418084	0.147416261	0.88360386	-0.355874188	0.411720799	-0.355874188	0.411720799

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From the calculation: During Pandemic

Mkt-RF = 1.037194752 , SMB = -0.160284075 & HML = 0.027923306

Observations:

- The **Mkt-RF (Market Risk Premium) of 1.0372** is greater than 1, indicating that the corporation was more exposed to market risk during the pandemic. shifts in the market were crucial for determining results.

- The negative coefficient value suggests a slight inverse relationship between the company's returns and the SMB factor. This suggests that during the pandemic, the company's returns decreased slightly as the SMB factor increased.

3. Key Comparison & Analysis:

	Analysis
Mkt-RF	Pre-pandemic: 0.5924 During pandemic: 1.0372 ▪ The market risk premiums beta rose significantly during the pandemic, indicating that the returns of the business become increasingly susceptible to changes in the market as a whole. ▪ The rise in the Mkt-RF beta suggests that the company's returns became more reliant on market conditions during the pandemic, reflecting increased market uncertainty and volatility.
SMB	Pre-pandemic: -0.5441 During pandemic: -0.1603 ▪ The negative correlation with the size component weakened significantly. ▪ Prior to the pandemic, the company's returns were more consistent with large-cap characteristics (negative SMB). During the epidemic, this influence decreased, showing that the size component was less important in predicting returns.
HML	Pre-pandemic: -0.1915 During pandemic: 0.0279 ▪ Before the pandemic, the company's returns exhibited a slight negative correlation with value stocks, aligning more with growth stock characteristics. During the pandemic, this negative correlation weakened, likely because growth stocks played a dominant role in returns due to pandemic-related trends such as increased technology adoption and economic stimulus measures.

4. Factors Affecting a Company's Beta

Events	Reasonings
Mergers & Acquisitions or Diversification	▪ If a firm diversifies its operations, its beta is expected to fall since diversification decreases reliance on specific industries and spreads risk, resulting in more stable returns. ▪ In contrast, if the company alters its concentration to higher-risk segments or purchases a highly cyclical industry, its beta is expected to rise. This is because such actions increase the company's exposure to market changes, resulting in more volatility in returns and a higher beta.
Industry Shifts or Economic Cycles	▪ Industry shifts and economic cycles can have a substantial impact on a company's beta. Companies in industries such as technology and consumer electronics tend to have higher betas during economic downturns because they are more sensitive to market conditions. ▪ Companies in more stable industries, such as food and beverage or telecommunications, typically have lower or steady betas since their revenues are less affected by economic cycles. This dynamic implies that, while some industries may experience an increase in beta during difficult economic times, others stay relatively protected, resulting in lower beta values.
Regulatory Changes	▪ New rules that tighten controls or add uncertainty might raise a company's beta because investors may perceive more risks associated with compliance and operational improvements.
Changes in Leverages	▪ Rise in a company's financial leverage (debt) can raise its beta since debt increases volatility, making the stock more sensitive to market movements. ▪ Paying down debt, on the other hand, can reduce beta by stabilizing the company's earnings, making them more predictable and less volatile.

Citations:

- FactSet. (n.d.). *SBUX: Starbucks Corporation - Price History*. FactSet. Retrieved Sept 15, 2024, from https://my.apps.factset.com/navigator/company-security/price-history/SBUX-US