

PERFORMANCE ANALYSIS OF MAJOR U.S. RETAIL AND E-COMMERCE COMPANIES

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ABSTRACT

We analyze performance of stocks of major U.S. retail and e-commerce companies on an individual basis as well as in a portfolio context. We find that some of these companies show evidence of superior performance based on the index model, the Fama-French 3-factor model, the most recent Fama-French 5-factor model and/or other well-known performance measures. The efficient portfolio comprising stocks of these companies also strongly outperforms the market benchmark irrespective of the short selling assumption. An extension of this paper is to compare the performance of this “home-made” efficient portfolio with that of professionally managed exchange traded funds that mimic retail sector indices and active funds that focus on the retail industry.

INTRODUCTION

There are 47 major stock exchanges in the world and about 47,383 companies listed in various stock markets. There are 10,203 listed companies in Americas across 10 exchanges. Approximately 4000 companies are actively traded on NYSE or NASDAQ. In this paper, we analyze stock performance of 5 major U.S. retail and e-commerce companies. These companies are Target Corporation (TGT), eBay (EBAY), Amazon (AMZN), Bestbuy (BBY) and Walmart (WMT).

The overview of these 5 companies are shown in Table 1. These companies are considered “large cap” or “mega cap”. Their names are well-known. Their products and services are widely used by consumers around the world. Walmart and Amazon lead the group with the largest revenue. Specifically, Walmart is the world’s largest retail company according to the Forbes Global 2000 list in 2018 in which the criteria are based on sales, profits, assets and market value. While Amazon has larger market capitalization than Walmart, it is the second largest retail company on the Forbes list and serves the e-commerce market on a global scale. Target, eBay and Bestbuy are also retail and e-commerce companies with respectable sales and large presence in the U.S. market.

DATA AND METHODOLOGY

We collect monthly price data from Yahoo Finance. We then convert prices to monthly returns. The sample is from January 2013 through December 2017. We obtain risk factor returns for the index model, the Fama-French 3-factor model and the Fama-French 5-factor model (Sharpe 1964; Fama and French, 1992, 1993, 2006, 2015) from Kenneth French Data Library. Abnormal returns from these three models are computed. The market model is estimated for each stock i over the full sample period as in (1).

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_i(R_{m,t} - R_{f,t}) + e_{i,t} \quad (1)$$

where $R_{i,t}$ is the return on stock i in month t , $R_{f,t}$ is the T-bill return in month t , $R_{m,t}$ is the return on the market in month t and $e_{i,t}$ is the error term. α_i is the intercept or alpha which measures the systematic-risk-adjusted abnormal return on stock i . Then, the Fama and French 3-factor model is estimated as in (2).

$$R_{i,t} - R_{f,t} = a_i + \beta_i(R_{m,t} - R_{f,t}) + s_iSMB_t + h_iHML_t + e_{i,t} \quad (2)$$

where SMB_t is the size factor for month t and HML_t is the value factor for month t . The intercept a_i indicates the systematic-risk-adjusted abnormal return on stock i after the risk related to market, size and value is taken into consideration. Further, the Fama and French 5-factor model is estimated as in (3).

$$R_{i,t} - R_{f,t} = a_i + \beta_i(R_{m,t} - R_{f,t}) + s_iSMB_t + h_iHML_t + r_iRMW_t + c_iCMA_t + e_{i,t} \quad (3)$$

where RMW_t is the operating profitability factor for month t and CMA_t is the investment factor for month t . The intercept a_i shows the systematic-risk-adjusted abnormal return on stock i after accounting for the risk related to market, size, value, profitability and investments.

Other well-known performance measures including Sharpe ratios (excess return per unit of total risk), Treynor ratios (excess return per unit of systematic risk) and information ratios (abnormal return per unit of unsystematic risk) are also calculated. Importantly, we construct an efficient portfolio (Markowitz, 1952) that includes the 5 stocks as an opportunity set and yields the highest Sharpe ratio possible. We derive two efficient portfolios -- one with short selling allowed and the other with short selling disallowed.

RESULTS

Table 2 presents results for individual stocks. AMZN, BBY and WMT consistently yield positive abnormal returns based on the index, Fama-French 3-factor and Fama-French 5-factor models. Surprisingly, BBY, as opposed to the more formidable AMZN and WMT, provides the largest abnormal returns in all three models. BBY also has the highest information ratio of 0.2137. AMZN has the highest Sharpe ratio of 0.3739 which is only slightly lower than that of the market benchmark of 0.3892. WMT has the highest Treynor ratio of 3.3431 due mainly to its very low beta of 0.2773 relative to other stocks. In sum, AMZN, BBY and WMT appear to show evidence of superior performance relative to the market benchmark. TGT and EBAY, in contrast, do not perform well on an individual basis.

Table 3 shows results for efficient portfolios. When short selling is allowed, TGT has a negative weight of 8.2110% and EBAY has a small weight of 1.1064% in the efficient portfolio. When short selling is disallowed, both TGT and EBAY have zero weights in the efficient portfolio. These results reiterate their

relatively poor performance from Table 2. Further, the abnormal returns for both efficient portfolios are positive and statistically significant across all three models. The information ratios for both efficient portfolios are appreciably higher than those of individual stocks in Table 2. Finally, the Sharpe and Treynor ratios for both efficient portfolios are considerably higher than that of the market benchmark.

CONCLUSIONS

We investigate individual and portfolio performance of stocks of major U.S. retail and e-commerce companies. Results suggest that Amazon, Walmart and Bestbuy dominate individual and portfolio performance. Investors may benefit from superior performance and yet simplicity of the “home-made” efficient portfolio comprising only a few major retail and e-commerce stocks. An extension of this paper is to investigate how the “home-made” efficient portfolio comprising of these stocks performs relative to professionally managed exchange traded funds that mimic retail sector indices and active mutual funds that invest heavily in stocks within the retail industry.

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Table 1: Overview of Companies: Target Corporation, Amazon.com, Inc., eBay Inc., Best Buy Co., Inc. and Walmart Inc.

	TGT	EBAY	AMZN	BBY	WMT
Employees	345,000	14,100	566,000	125,000	2,300,000
Scale	Large-Cap	Large-Cap	Mega-Cap	Large-Cap	Mega-Cap
Revenue	\$69.5 B	\$9.6 B	\$177.9 B	\$39.4 B	\$500.3 B
Total capitalization	\$43.01 B	\$33.25 B	\$894.68 B	\$21.26 B	\$264.4 B
Outstanding shares	533.14 M	993.98 M	487.74 M	279.39 M	2.95 B
Shares shorted by investors	31.34 M	26.53 M	5.05 M	21.36 M	36.37 M
Cash	\$1.06 B	\$4.81 B	\$24.96 B	\$2.8 B	\$7.89 B
Cash flow from operations	\$2.29 B	\$1.86 B	\$8.68 B	\$1.13 B	\$16.28 B
Cash-per-share (CPS) ratio	1.99	4.48	51.45	10.01	2.67

Table 2: Performance of Individual Stocks

	Beta	Abnormal Return			Sharpe Ratio	Treynor Ratio	Information Ratio
		Alpha	FF 3-Factor Intercept	FF 5-Factor Intercept			
TGT	0.6394	-0.0906	-0.0386	0.1954	0.0952	0.9255	-0.0151
EBAY	1.4102	-0.3291	-0.2856	-0.2925	0.1594	0.8337	-0.0519
AMZN	1.4260	1.3290	1.2175	0.9711	0.3739	1.9990	0.2013
BBY	1.4313	2.3042	2.3630	2.4853	0.3350	2.6769	0.2127
WMT	0.2773	0.6311	0.5543	0.5618	0.1932	3.3431	0.1324
Market Benchmark (M)					0.3892	1.0671	

Table 3: Performance of Efficient Portfolios

	Portfolio Weight (%)	Beta	Abnormal Return		Sharpe Ratio	Treynor Ratio	Information Ratio	
			Alpha	FF 3- Factor Intercept				FF 5- Factor Intercept
Efficient Portfolio		1.1778	1.5322**	1.4702**	1.3684**	0.5018	2.3680	0.3359
Short selling allowed:								
TGT	-8.2110							
EBAY	1.1064							
AMZN	49.3972							
BBY	30.3478							
WMT	27.3596							
Efficient Portfolio		1.1634	1.4422**	1.3864**	1.3019**	0.5003	2.3067	0.3317
Short selling disallowed:								
TGT	0							
EBAY	0							
AMZN	48.9530							
BBY	28.0573							
WMT	22.9897							
Market Benchmark (M)					0.3892	1.0671		

Note: ** denotes statistical significance at the 5% level.