Fewer Reasons to Sin: A Five-Factor Investigation of Vice Stocks

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Abstract

This paper investigates the return performance of a portfolio of U.S. "vice stocks," firms that manufacture and sell products such as alcohol, tobacco, gaming services and national defense. In my research, I examine a portfolio of sixty five vice stocks over the period 1996 to 2016. Using daily return data, I compute the Jensen's alpha (CAPM), Fama-French Three Factor, Carhart Four-Factor, and Fama-French Five-Factor results for the complete vice portfolio, and each vice industry individually. Results from the CAPM, Fama-French Three Factor Model, and the Carhart Four-Factor Model show a positive and significant alpha for the vice portfolio throughout the sample period. However, the alpha's significance disappears with the addition of the explanatory variables from the Fama-French Five-Factor Model. Further, after controlling for the Five-Factor model variables, the significance of the alpha disappears in the vice industry returns. However, the alpha maintains its significance during a bull market subsample.

Keywords: Vice Investing; Sin stocks; Fama-French Five-Factor Model; Carhart Model

JEL Classifications: G11; G12; G19; M14

1. Introduction

Vice: "*moral depravity or corruption.*" "*A moral flaw or weakness*."

— (Merriam-Webster)

In the social sciences, the idea of making choices in the corporate world according to social norms has existed for quite some time and, in some settings, has even taken precedence over the focus on profit maximization. Akerlof (1980) defines a social norm as an act whereby the agent performing it receives utility based on the beliefs of other community members. Social norms may play a role in influencing investment choices; Becker (1957) finds that agents with discriminatory tastes arising from social norms bear financial costs from their decisions not to interact with certain types of people. Essentially, these theories argue that agents may suffer financial burdens by prioritizing social norms over profit maximization, which may be mutually exclusive at times. This idea can also be applied to investing.

Adherence to social norms, psychological biases, and other non-traditional factors is an important aspect of portfolio selection. One popular investment strategy that considers social norms is Socially Responsible Investing (SRI), a tactic whereby investors construct a portfolio of firms that do not engage in the production of tobacco, alcohol, or gaming activities. SRI has gained popularity over the last twenty five years, and in 2016, socially responsible funds managed approximately $9 trillion in assets from an overall investment pool of $40 trillion in the US (Social Investment Forum 2016). SRI funds have the stated goal to promote companies sound in ethical values and moral values and discriminate

against companies that promote vice (Heal, 2008). Empirical studies on Socially Responsible Investing have dated back to Moskowitz (1972) and have provided mixed results (see Hamilton et al., 1993, Statman, 2000, Bello, 2005 and Bauer et al., 2009).

On the contrary, an antithesis to SRI has emerged, an investment strategy that focuses on the violation of social norms—"vice investing" or "sin investing." This investment strategy entails a direct contrast to Socially Responsible Investing by creating a portfolio of firms from industries that are screened by SRI funds, pension funds and investment managers. Vice investors focus primarily on the "Sin Triumvirate:" tobacco, alcohol, and gaming (gambling) stocks. Investors in "vice" bet that the cash flows and defensive nature of these industries provide risk-adjusted abnormal returns when compared to a benchmark. This investment niche may have evolved from Merton's (1987) "neglected stock" theory, which states that firms with a smaller investor base will be followed by fewer analysts and thus provide a higher return for investors. Merton argues that when investors "neglect" firms, it impacts that firm's risk-adjusted returns and affects its equity returns. Merton, however, does not state neglected stocks lack the *quality* of information, only the *quantity* of information from the missing coverage.

This paper examines the traditional performance measures of a portfolio constructed of firms from "sin," or "vice" related industries. I employ Jensen's alpha, the Fama-French Three-Factor model, the Carhart Four-Factor Model and the newly-created Fama-French Five-Factor Model to investigate whether a portfolio of vice stocks outperforms (on a risk-adjusted basis) the S&P 500, a benchmark to approximate the market portfolio of risky stocks. In addition, I use the aforementioned models to determine how individual vice industries (Alcohol, Tobacco, Gambling, and Defense) have

performed against the market portfolio on a risk-adjusted basis. For a sensitivity analysis, I also consider market conditions and investigate returns during bull and bear markets.

This paper contributes to the existing literature on vice investing in two unique ways. First, I provide academics and practitioners with results from an updated model. As of this writing, I am unaware of any articles published in peer-reviewed academic journals that investigate vice stocks within the framework of the Fama-French Five-Factor Model (2015): the existing literature does not shed light on the relationship between "profitability" & "aggressiveness" (the fourth and fifth factors of the Fama-French model) and vice stock returns. Second, within the framework of the Fama-French Five-Factor Model, I show results not only from a portfolio of vice stocks, but from various vice industries as well. The industry results highlight the defensive nature of vice stocks, an important component of their risk-adjusted returns.

I organize the remainder of the paper into five sections. Section 2 provides a literature review. In Section 3, I describe the data and portfolio selection. In Section 4, I present the methodology. I present empirical results in Section 5, along with a robustness check in Section 6. Section 7 concludes.

2. Literature Review

Although an abundance of literature exists on Socially Responsible Investments, the amount of research dedicated to "vice investing" remains limited in both empirical and theoretical relevance. In a seminal paper, Chong et al. (2006) use traditional performance measures to evaluate the Vice Fund (a mutual fund that invests in vice industries: VICEX) and then apply a generalized autoregressive conditional heteroscedasticity (GARCH (1, 1))

model. The authors find the Vice Fund outperformed the Domini Social Equity Fund (the benchmark for socially responsible investments) over a three-year period from 2002-2005.

In the most widely-cited work on vice stocks to date, Hong and Kacperczyk (2008) use data from 1965-2004 and find sin stocks outperformed their benchmarks by up to 30 basis points per day. They find no systematic relationship between vice stock returns and the association of litigation risk, which states vice stocks generate a higher return to compensate investors for the risk of lawsuits. Hong and Kacperczyk (2008) also conclude that vice stocks are underpriced due to neglect by institutional investors, who lean on the side of Socially Responsible Investing. The authors attribute sin stocks' risk-adjusted abnormal return, or alpha, to the "norm-constrained hypothesis," which proposes that norm-constrained investors "neglect" firms from sin-related industries. Moreover, the authors find the defensive nature of vice rests in the addictive traits of the products produced by vice industries.

In another study, Salaber (2007) finds that sin stocks earn excess returns relative to the market, but that excess return disappears when they compare sin stocks to a portfolio with similar defensive characteristics. Salaber (2007) also finds that sin stocks outperform during market downturns but underperform during upswings. The author attributes the superior performance during market downturns to the addictive properties of vice industry products. In a contrast to the findings of Chong et al. (2006), Hoepner and Zeume (2009) use a time series approach and find the Vice Fund's "abnormal" return does not statistically differ from zero and also report that the Vice Fund's management's trading instability to be statistically significant at the 1% level over a six-year sample period.

Fabozzi et al. (2008) examine a sample of sin stocks across 21 countries over the period of 1970 to 2007. They present empirical evidence that sin stocks outperform the market in terms of both magnitude (annual excess returns over the respective market portfolios averaged 11.15%) and frequency (sin portfolios outperformed the benchmark market indices in 35 of 37 years in their study). They identify the main reason for the outperformance of sin stocks lies in not abiding to or upholding implicit or explicit costly social standards.

Areal et al. (2010) use data from 1993-2009 and find the "irresponsible fund" outperforms the market when volatility is low, but underperforms the benchmark during times of high-volatility. The authors attribute the results to changing risk throughout the sample period. They conclude the "irresponsible fund" exhibits a higher level of systematic risk (beta) in low volatility regimes, a lower level of systematic risk in high volatility regimes, and deserves further research. Visaltanachoti et al. (2009) compute Jensen's alpha and Tobin's Q with a portfolio of Chinese and Hong Kong sin stocks and show that the sin stocks outperformed their indexes in both China and Hong Kong over the period 1995-2007.

Perez-Liston and Soydemir (2010) investigate portfolio performance between sin stock returns and faith-based portfolio returns. They find that Jensen's alpha was positive and significant for their sin portfolio. They also find evidence of "norm-conforming" investor behavior in the faith-based portfolio, which returned a negative, yet significant alpha. Durand et al. (2013) focus on social norms (individualism and collectivism) and examine sin stocks in seven Pacific-Basin markets. They find that "substantial shareholders" are less likely to hold sin stocks in nations that have cultural norms which

are different from those in the U.S. They also find that sin stocks generate negative risk-adjusted returns in the markets covered. Richey (2014) employs the Fama-French Three-Factor Model and Richey (2016) employs the Carhart Four-Factor Model, examines the daily returns of a vice portfolio over the period 1995-2015, and finds that vice stocks outperform the market on a risk-adjusted basis.

3. Data

Using daily stock return data from CRSP (Center for Research in Securities Prices) over the period October 1996 to October 2016, I examine the return performance of a portfolio constructed of sixty five corporations from vice-related industries. To avoid problems with outliers, I winsorize these daily return data at the 1st and 99th percentiles. For my vice portfolio selection, I understand that the definition of "sin" may be ambiguous or subjective at best, depending on one's social norms, upbringing, or cultural values; therefore, I start with the "Triumvirate of Sin" used in Hong and Kacperczyk (2009). These domestic firms come from alcohol, tobacco and gambling industries that are listed on the New York Stock Exchange, NASDAQ, or NASDAQ OTC.

The firms from the vice industries are based on KLD ratings of controversial business issues[1]. Firms in the alcohol industry license its company or brand name to alcohol-related products or manufacture alcoholic beverages, including beer, wine, or distilled spirits. Firms in the gambling industry license its company to brand name to gambling products or produce goods that are exclusively used for gambling, such as slot

[1] Kinder, Lyndenbeg, Domini, & Co. (KLD) dataset is a leading database providing data and information on Corporate Responsibility (CSR) and social issues. KLD data are based on numerous sources, including annual surveys, SEC filings, press releases, and academic journal publications.

machines, lottery terminals or roulette wheels. Firms in this industry also services in casinos that are fundamental to gambling operations. Tobacco firms license their brand name to tobacco products or produce tobacco products such as cigars, cigarettes, pipe tobacco, or smokeless tobacco products.

I add defense firms and adult entertainment firms to complete my portfolio of vice stocks. Firms in the defense industry derive more than 2% of revenues from the sale of conventional weapons or from customized components of conventional weapons. The firms may also engage in the production or sale of small-arms ammunition or firearms, including revolvers, pistols, rifles, shotguns or non-lethal firearms (tasers). Adult entertainment firms provide or manufacture subscription-based adult entertainment (Playboy), online entertainment, adult products, or operate adult-themed clubs.

I exclude privately-owned firms and foreign firms unless they can be purchased on an American exchange through an American Depository Receipt (ADR). The Appendix presents the sixty five firms held in the vice portfolio alphabetically, along with ticker symbol and industry. Table 1 presents the total number of firms in the portfolio by industry (20 Alcohol manufactures, 18 Corporations in the Gambling industry, 9 Tobacco firms, 14 Defense corporations, and 4 Adult entertainment firms).

[Insert Table 1 Here]

Table 2A below presents the summary statistics of the "*ViceFund*" and each of the vice industry portfolios over the sample period. The daily return data over the sample period yield a sample size of 5034 observations for the total portfolio of vice stocks, as

well as for each individual vice industry. The table shows the daily mean return of the portfolio at 0.0314% (or 11.46% per annum). For clarity, I create the following abbreviations for each vice industry: *BoozeFund* (alcohol index), *SmokeFund* (cigarettes and tobacco index), *GambleFund* (casino and gaming services index), and *Boomfund* (defense industry index)[2]. I hereafter refer to the complete portfolio of vice stocks as the *ViceFund*.

[Insert Table 2A Here]

4. Methodology

4.1 *Jensen's alpha*

I begin with Jensen's alpha to measure the performance of the *ViceFund*. Pioneered by Jensen (1968) to assess the performance of mutual fund managers, Jensen's alpha is a measure based on the Sharpe-Lintner (Sharpe, 1964; Lintner, 1965) Capital Asset Pricing Model (CAPM). Jensen argues that a portfolio's financial performance can be approximated by its systematic return component unexplained by the overall market portfolio return. With the S&P 500 as a proxy for the market portfolio and a benchmark for the *ViceFund*, Jensen's alpha can be described as follows:

[2] I do not create an index for the Adult Entertainment stocks due to the small number of firms that comprise the industry.

$$r_{p,t} = \alpha_p + [r_{ft} + \beta_{(} r_{mt} - r_{ft})] + \varepsilon_t \quad (1)$$

where r_{pt} is the rate of return on portfolio p (or asset i) at time t, r_{ft} denotes the risk-free rate of return, based on the continuously compounded daily return of 30-day U.S. Treasury Bills, and r_{mt} denotes the continuously compounded daily returns of the S&P 500 Composite Index. Subtracting r_{ft} from r_{mt} gives the *Market Risk Premium*, or the expected return above the risk-free rate that an investor would receive by investing in the market portfolio. The coefficient β represents the asset's (portfolio's) systematic risk of being exposed to the return of the market portfolio during the sample period and ε_t represents a well-behaved random disturbance term with mean zero.

In order to isolate a risk-adjusted abnormal return, I test for the alpha coefficient. Alpha (α_i) represents the abnormal market performance of the asset on a risk-adjusted basis. Alpha measures the performance returns of a portfolio or stock i earned above (if alpha is positive) or below (if alpha is negative) a diversified market portfolio of risky assets formed with some combination of stocks and the risk-free asset. Thus, we can rewrite the measure from equation (1) to solve for alpha in equations (2) & (3), where, intuitively, alpha equals the abnormal return of the portfolio, or the actual return of the portfolio minus its expected, or required return:

$$\alpha_p = \textit{Actual Return} - \textit{Expected return} \quad (2)$$

$$\alpha_p = r_{pt} - [r_{ft} + \beta(r_{mt} - r_{ft})] + \varepsilon_t \quad (3)$$

Next, I rearrange the terms slightly and generate the time-series regression equation:

$$r_{pt} - r_{ft} = \alpha_p + \beta(r_{mt} - r_{ft}) + \varepsilon_t \tag{4}$$

4.2 *Fama-French Three Factor Model*

The CAPM remains widely used in empirical finance; however, the model fails to capture anomalies left unexplained by systematic risk. As a result, the model has developed in the literature and has evolved to provide researchers and portfolio managers with other factors beyond systematic risk to explain stock returns. One such development is the Fama-French Three-Factor Model, which controls for abnormal returns from investing in small stocks and firms with high book-to-market ratios. Fama and French (1992, 1993) expand the CAPM by including two additional factors beyond systematic risk: *SMB* (Small minus Big) and *HML* (High minus Low) factors. Fama and French (1992, 1993) added the SMB factor to incorporate the risk factors related to firm size and applied the HML factor to include the risk inherent in firm value. Fama and French (1992, 1993) find these two additional factors provide greater explanatory power over the original CAPM in evaluating stock performance. The specification of the three-factor model regression is as follows:

$$r_{pt} - r_{ft} = \alpha_p + \beta(r_{mt} - r_{ft}) + \gamma_p SMB_t + \delta_p HML_t + \varepsilon_t \tag{5}$$

where $r_{pt} - r_{ft}$ represents the return of the portfolio less the risk-free rate for the period t, r_{mt} is the return on the market portfolio (the S&P Index), SMB represents the size factor ,

HML gives the growth factor, and ε_t represents a random disturbance term. The symbols β, γ *and* δ represent the coefficients for their respective variables. Finally, α captures the "alpha" or the abnormal return provided by the portfolio that is left unexplained by the other three risk factors.

Obtained from Kenneth French's Data Library, the SMB & HML factors provide the evidence that the original CAPM fails to incorporate. The SMB factor, shown in equation 6-a, includes risk associated with firm size and is constructed by subtracting the average return of three constructed "big" portfolios from the average returns of three constructed "small" portfolios. In order to determine what constitutes "big" or "small," Fama & French (1992, 1993) rank firms on the NYSE according to size and the median size of these NYSE firms is used to separate all NYSE, NASDAQ, and AMEX firms into the categories "big" and "small."

Next, all of the firms are grouped according to their book-to-market equity (BE/ME) ratios. The first group (Growth) is comprised of stocks in the lowest 30 percentile. According to Fama & French (1992, 1993), these "growth" stocks are associated with persistently high earnings (EPS) and possess low book-to-market equity ratios, indicating a high stock price relative to book value. The middle group (Neutral) represents firms in the middle 40% and the remaining 30% are grouped into the highest (Value) category. Fama & French (1992, 1993) then use the two size portfolios and three value portfolios to create the *SMB* factor shown below:

$$\begin{aligned} SMB = {} & 1/3(Small\ Value + Small\ Neutral + Small\ Growth) \\ & - 1/3(Big\ Value + Big\ Neutral + Big\ Growth) \end{aligned} \tag{6-a}$$

Fama & French continue with the previously mentioned portfolio designations to construct the HML factor, shown in equation 6-b, which measures the return /risk undertaken by an investment based on "Value" or "Growth" strategies.

$$HML = 1/2(Small\ Value + Big\ Value) - 1/2(Small\ Growth + Big\ Growth) \qquad (6\text{-b})$$

4.3 *Carhart Model*

Carhart (1997) expands the Fama-French Three-Factor Model to include a momentum, or "hot hand" factor. Based on Jegadeesh and Titman (1993), the momentum factor argues investors can achieve superior performance by buying stocks that have performed well in the past 3-12 months (winners) and selling stocks that have performed poorly in the last 3-12 months (losers). Momentum data collected from Kenneth French's website are based on six value-weighted portfolios formed on size and prior (2-12 day) returns. The portfolios, formed daily from NYSE, AMEX, and NASDAQ stocks with prior return data are the intersections of 3 portfolios formed on size (market equity) and 3 portfolios formed on the prior 2-12 day returns. French indicates the daily size breakpoint is the median NYSE market equity and the daily prior 2-12 day return breakpoints are the 30th and 70th NYSE percentiles. The momentum factor is computed as follows:

$$MOM = 1/2\ (Small\ High + Big\ High) - 1/2(Small\ Low + Big\ Low) \qquad (6\text{-c})$$

I test the Carhart Four-Factor Model as follows:

$$r_{pt} - r_{ft} = \alpha_p + \beta_p(r_{mt} - r_{ft}) + \gamma_p SMB_t + \delta_p HML_t + \mu_p MOM_t + \varepsilon_{,t} \quad (7)$$

4.4 *Fama-French Five-Factor Model*

Fama and French (2015) report results from Titman et al. (2004) & Novy-Marx (2013) and find the Three-Factor model misses the variation in average returns associated with *profitability* and *investment*. As a result, Fama and French (2015) added a profitability factor and an investment factor to expand the explanatory power of the Three-Factor model. In the Five-Factor equation below, *RMW* refers to the difference between stock returns of diversified portfolios with *robust* and *weak* profitability, or the average return on two robust operating profitability portfolios minus the average return on two weak robust operating profitability portfolios. The *CMA* variable refers to the difference between returns on diversified stock portfolios from *low* and *high* investment corporations. Fama and French (2015) refer to the low and high investment firms as *conservative* and *aggressive*, respectively, where *CMA* measures the average return on two conservative investment portfolios minus the average return on two aggressive investment portfolios:

$$RMW = 1/2(Small\ Robust + Big\ Robust) - 1/2(Small\ Weak + Big\ Weak) \quad (8\text{-a})$$

$$CMA = 1/2(Small\ Conservative + Big\ Conservative) - 1/2(Small\ Aggressive + Big\ Aggressive) \quad (8\text{-b})$$

I investigate the *Vicefund* with the Fama-French Five Factor model as follows:

$$r_{pt} - r_{ft} = \alpha_p + \beta (r_{mt} - r_{ft}) + \gamma_p SMB_t + \delta_p HML_t + \rho_p RMW_t + \tau_p CMA_t + \varepsilon_t \qquad (9)$$

where:

r_{pt} = the return on the equal-weighted *Vicefund* on day *t*

r_{ft} = the return on a thirty-day t-bill on day *t*

r_{mt} = the return on the S&P 500 index on day *t*

SMB = the difference between the return on a small-cap portfolio on day *t* and the return on a large-cap portfolio on day *t*

HML = the difference between the return on a high book-to-market portfolio on day *t* and the return on a low book-to-market portfolio on day *t*

MOM = the return on the two high prior return portfolios minus the average return on the two low prior return portfolios[3]

RMW = the difference between the return on a robust (profitability) portfolio on day *t* and the return on a weak (profitability) portfolio on day *t*

CMA = the difference between the return on a conservative portfolio on day *t* and the return on an aggressive portfolio on day *t*

α_p = the risk-adjusted excess return on the equal weighted portfolio

β_p = the sensitivity of the excess return on the equal-weighted vice portfolio to the excess return of the market portfolio

γ_p = the sensitivity of the excess return on the equal-weighted vice portfolio to the size factor

δ_p = the sensitivity of the excess return on the equal-weighted vice portfolio to the value factor

μ_p = the sensitivity of the excess return on the equal-weighted vice portfolio to the momentum factor

ε_t = random error term

[3] I do not include the momentum factor from Carhart (1997) when I run the Five-Factor model regressions.

Before discussing the empirical results from the traditional models, I briefly examine the correlation coefficient matrix between the independent variables of the Fama-French Five-Factor Model and the Momentum factor from the Carhart (1997) Model in Table 2B. The market risk premium, $r_m - r_f$, is negatively correlated with the HML, MOM, RMW, and CMA factors from the traditional models. As Fama & French (2015) point out, there exists correlation between the HML (High minus Low) book-to-market factor and the CMA (Conservative minus Aggressive) investment factor with a positive correlation of 0.478 over the sample period. The RMW (Robust minus Weak) profitability factor and the CMA (Conservative minus Aggressive) investment factors from the Five-Factor are positively correlated with a coefficient of 0.30 over the sample period. None of the other variables have a positive or negative correlation that is high enough to raise multicollinearity concerns.

[Insert Table 2B Here]

5. Empirical Results

This section examines each of the vice industries as well as the total *Vicefund* using ordinary least squares (OLS) with Newey-West standard errors, to control for the serial correlation of the error terms. I begin by arranging the sixty five individual vice stocks into a price-weighted portfolio. Ignoring transaction, or brokerage costs, I perform regressions for the sin-focused *ViceFund* portfolio. The null hypothesis, H_0: $\alpha = 0$, states the portfolio does not provide a risk-adjusted abnormal return for investors (market efficiency). I present the results of the *Vicefund* portfolio regressions from all tested

models in Table 3 below. I then present results from the vice industry portfolios in Tables 4 through 7 below. I then present results from the Fama-French Five-Factor model for the *Vicefund* and each industry fund during bull-market periods and bear-market periods. I present those robustness results in Tables 8 and 9.

[Insert Table 3 Here]

Empirical results from the *Vicefund* in Table 3 above show the portfolio of vice stocks outperformed the market index (S&P 500) over the period October 1996 to October 2016 on a risk-adjusted basis. The alpha (α), or abnormal risk adjusted return, shows a positively significant coefficient in the CAPM, Fama-French Three Factor, and Carhart Four-Factor models. All models, including the Five-Factor model indicate the *Vicefund* portfolio beta (β) is significant at the 1% level with coefficients ranging between 0.588 and 0.736. These results indicate the vice portfolio exhibited less market risk or volatility over the sample period than its benchmark, the S&P 500 Index, which by definition has a beta equal to one. This result mirrors previous research (Perez Liston and Soydemir, 2010) and reinforces the defensive nature of sin portfolios. Further, R-squared results from the models ranged from 0.52 for the CAPM regression to 0.64 for the Fama-French Five Factor model.

The coefficients from the Three-Factor model as well as the momentum factor from the Four-Factor model produced significant coefficients. The SMB (Small minus Big) size factor returned a negative sign in all regressions, implying the return performance of small-cap stocks explain some of the *Vicefund's* investment returns. Many of the firms in

the *Vicefund* also possess high book-to-market (B/M) values, which is in line with the less-aggressive investment patterns seen in mature, conservative firms in defensive industries. The HML (High minus Low) variables returned statistically significant results (at the 5% and 1% levels) in all models tested, implying the value-based nature of the *Vicefund* has strong explanatory power in the fund's performance[4].

The most important finding was that the alpha returned a positive, albeit insignificant coefficient in the Fama-French Five-Factor model. This results contrasts previous findings that suggest "vice funds" outperform the market on a risk-adjusted basis. The highly significant CMA (Conservative Minus Aggressive) coefficient in the Five-Factor model may help explain the performance of vice stocks Vis á Vis the market portfolio that previous models fail to capture. Essentially, Five-Factor model controls for the difference between returns on portfolios of low & high investment corporations and emphasizes the importance of sound capital budgeting techniques.

Table 4 reports the portfolio returns of the *Boozefund*, a portfolio of twenty "Breweries & Wineries and Distilleries." In this Table, I present the regression results of the CAPM, the Three-factor Model, the Four-Factor Model, and the Five-Factor Model in columns (i) through (iv) respectively. The results show the *Boozefund* exhibited less market risk then the market portfolio over the sample period, with a beta coefficients ranging from 05 in the CAPM regression to 0.7 in the Five-Factor regression. The alpha, although positive, remains insignificant throughout all models, even in the CAPM

[4] Fama and French (2015) state that the HML factor may be a redundant variable in the model. That is, the CMA factor from the Five-Factor Model, which controls for conservative vs. aggressively investing firms, alludes to the performance of value stocks and/or mature firms.

regression. This result implies the returns from the *Boozefund* can be explained by the portfolio's systematic risk; in other words, investors did not receive an abnormal risk-adjusted return throughout the sample period. Similar to the results from the *Vicefund*, the book-to-market (HML), size factor (SMB) and bandwagon effect (MOM) variables retained their significance and sign across all models.

[Insert Table 4 Here]

In Table 5, I report the estimation results from the *Smokefund*, a portfolio of nine cigarette manufacturers and "other tobacco products" manufacturers. All four models in Table 5 indicate the market-risk premium (β) is statistically significant at the 1% level with coefficients ranging between 0.5 and 0.7. Thus finding illustrates the defensive nature of the tobacco industry throughout the sample period. Other results in Table 5 show the *Smokefund* possessed a positively significant book-to-market indicator (HML) in the Three-Factor and Carhart models; however, the sign changes with the addition of the conservative investment indicator (CMA) from the Five-Factor model. The alpha is positive and significant in the CAPM, Three-Factor, and Carhart models, but the alpha's significance disappears with the addition of the of the *profitability* and *investment* variables from the Five-Factor models. These results imply the Fama-French Five-Factor model explains away the risk-adjusted abnormal return results from the previous models.

Although tobacco manufacturers focus primarily on cigarettes, many of these firms diversify to alleviate the negative stigma associated with sin and also to reduce expropriation risk. Beneish et al. (2008) find the market rewards cash-rich tobacco

corporations for undertaking diversifying acquisitions because a greater "domestic geographic presence enables tobacco firms to influence politicians in a greater number of political districts and makes the firms' political contributions more effective." It is also worth noting that CalPERS' (California Public Employees Retirement System) board of directors rejected recommendations from staff to lift its sixteen year ban on tobacco stocks. However, board members did not (publicly) reach the decision based on the notion of sin; they stated that they did not believe tobacco would be an economically sustainable investment down the road.[5]

[Insert Table 5 Here]

In Table 6, I report the performance results from the *Gamblefund*, a portfolio of eighteen casino and slot machine manufacturing firms. The results across all models show the *Gamblefund* exhibited less volatility then the market portfolio over the sample period, with betas ranging from 0.75 to 0.85. These results indicate gambling stock returns possess the defensive nature seen in other vice industries; that is, during market downturns or economic contractions, drinkers still drink, smokers still smoke, and gamblers continue to consume their "vice." Further, the alpha remains insignificant throughout all models, even in the CAPM regression. The book-to-market (HML) and the size factor (SMB) variables maintain their significance in the Three-Factor and Carhart models. The momentum factor (MOM) returned an insignificant coefficient in the Carhart model. In the Five-Factor regression, the Robust minus Weak (RMW) and Conservative minus Aggressive (CMA) variables returned positively significant coefficients, while the Small

[5] Los Angeles Times; December 19, 2016.

minus Big (SMB) variable lost its significance with the addition of the new Fama-French factors.

The lack of a significant alpha may be attributed to investors fleeing gaming stocks during times of any uncertainty. In a paper focusing on one "sin," Goodall (1994) researched gaming stocks and finds these firms to be more sensitive to market downturns than to upswings in the stock market. Intuitively, casino patrons gamble less during economic downturns and bear markets, yet do not increase gambling consumption during times of prosperity. Goodall's finding seems plausible and may Kahneman and Tversky's (1979) Prospect Theory, which states investors are more sensitive to losses than they are to gains. In another paper, Chen and Bin (2001) find gaming stocks' performance responds to changes in gambling legislation and underperform the market portfolio.

[Insert Table 6 Here]

Table 7 below reports the results from the *Boomfund*, a portfolio of defense manufacturing firms. The results show the *Boomfund* exhibited significantly less market risk then the market portfolio over the sample period with betas ranging between 0.57 and 0.69. The defensive nature of this industry may rest in the buoyancy of stock prices from public-sector support. Belo et al. (2013) find the defense industry as one industry with high exposure to government spending. Belo et al. (2013) report that during democratic presidential regimes, high governmental- exposure portfolios outperform low governmental-exposure portfolios by 6.1% per annum. However, the alpha remains insignificant throughout all regressed models, thus reinforcing the notion that the returns

can be attributed to the defensive nature of the firms. The momentum factor, which was insignificant in the *Gamblefund* regression, returned a highly significant, positive coefficient in the *Boomfund* results. [6]

[Insert Table 7 Here]

6. Vice Portfolio Returns During Bull and Bear Markets

Vice Stock Performance in a Market Boom

In Table 8, I present the Fama-French Five-Factor regression results of the *ViceFund* and each vice industry portfolio over the bull market period from February 2009 to the present (October 2016). Unsurprisingly, the alpha for the *Vicefund*, as well as for each of the vice industries (excluding the *GambleFund*), came back with positively significant alphas, indicating a return to vice spending on vice during "good times." In the *Vicefund* regression, the alpha returned a coefficient significant at the 1% level and an R-squared = 0.79. Although the alpha failed to yield a significant coefficient in the Five-Factor full-sample regressions, this finding shows that abnormal risk-adjusted returns may still be found during market upturns (with the risk of market timing). Also, the Small minus Big (SMB) and High minus Low (HML) variables from the three-factor model returned statistically significant negative coefficients for all portfolios. The wealth effect from the market upswing may have played a role in the increased consumption of

[6] It would be interesting to expand Belo et al.'s (2013) paper to investigate the timing of momentum strategies in relation to presidential elections.

alcoholic beverages, tobacco products, but not gambling, which returned an insignificant alpha coefficient.

[Insert Table 8 Here]

Vice Stock Performance in a Market Bust

In Table 9, I present the regression results from the Fama-French Five-Factor model during the bear market period of October 2007 to February 2009. In Column 1, I present the results from the *ViceFund*, and I present the results from the vice industry portfolios in Columns 2-5. After controlling for the market downturn, I find the alpha is no longer significant at any level or for any portfolio. These results may provide some evidence to refute the stereotype of inelastic (defensive) vice; that is, consumers do not reduce consumption of sin products during economic downturns.

Another interesting result during the Bear Market sample rests with the coefficient from the profitability factor (RMW) variable from the Five-Factor model. In the full sample, the variable returned a highly significant (at the 1% level) with a positive sign, indicating that profitability played a role in explaining the excess returns of the *ViceFund* compared to those of the market portfolio. However, in the Bear Market subsample, the coefficient turned negative, implying the lack of profitability during the market downturn had an impact on the performance of the *ViceFund*.

The coefficients from the Five-Factor variables in the vice industry portfolios returned the expected signs overall, with the exception of the size factor (SMB) in the *GambleFund*, which showed a positive statistically significant coefficient at the 1% level (the SMB variable was negative for all other vice industry regressions, as well as for the *ViceFund* analysis). Perhaps during market downturns, small-cap gambling-related firms do not perform as poorly as large-cap gambling producers. Intuitively, large casinos "take hits" during recessions, but slot machine and car table manufacturers possess more resilience.

[Insert Table 9 Here]

6. Conclusion

This paper employs four traditional, performance regressions: Jensen's alpha, the Fama-French Three-Factor Model, and the Carhart Four-Factor Model, and the new Fama-French Five-Factor model to analyze the performance of a portfolio of sixty five "vice" stocks from several industries over the period of October 1996 to October 2016. I find vice stocks possess a positive and significant alpha in the CAPM, Three-Factor and Carhart models, similar to the results found in Visaltanachoti et al. (2009), Hoepner & Zeume (2009), Richey (2016), and Perez Liston & Soydeimir (2016), indicating an abnormal return for the given level of systematic risk, size, book-to-market, and momentum. However, the significance disappears in the Five-Factor model with the

addition of the *conservative minus aggressive* (CMA) investment factor and the *robust minus weak* (RMW) profitability factor.

The results indicate that research on vice stocks deserves further undertaking as it has been shown to provide investors abnormal risk-adjusted returns under certain conditions. However, with the Five-Factor model, the abnormal returns vanish, indicating previous studies may have missed important explanatory variables. Intuitively, vice stocks provide higher returns because they are more profitable and less wasteful than the average corporation. As a result, further research on vice investing needs to investigate returns by examining additional factors beyond Fama-French and whether significance remains (or not) with the addition of non-financial variables. One idea might be to combine the five factors from Fama-French (2015) with the momentum factor from the Carhart (1997) model. Another suggestion might be to analyze the idiosyncratic risk of vice stocks.

Current research has already begun the task of examining vice stocks beyond the traditional empirical models. For example, after controlling for the role of investor sentiment, Perez (2016) finds the abnormal returns for sin stocks disappear. Fauver and McDonald IV (2014) examine time-varying social views and find sin stocks have an approximately 8% lower equity valuation in nations where society is strongly against sin-related industries. They also find sin stocks have excess returns of about 1-2% annually, after controlling for capital restrictions. Sabherwal et al. (2016) examine sin stocks during political regimes and find that, unlike the overall market (which performs better during Democratic Presidential regimes), sin stocks tend to perform better during Republican Presidential regimes. The authors link this performance to contributions that sin firms make to Republican candidates.

Although the vice stock portfolio may not be diversified enough to provide investors with a complete portfolio strategy, the imposition of vice-screens has not hurt investors. We may even see better behavior among sin firms. For example, Cai et al. (2012) find that US firms in "controversial industries" consider social responsibility important even though they manufacture and sell harmful products. As values change and the social, economic, & political climates become more/less averse to sin, we may see industries added/deleted to expand/contract the "Sin Triumvirate." A possible increase in the industries that constitute sin may serve to reduce a risk of vice investing—the lack of diversification. Further, more research needs to be done on how vice stocks differ around the globe; essentially, norms vary and vice in one nation may not be considered vice in another.

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TABLE 1: Vice Fund Portfolio by Industry

Alcohol	Tobacco	Gambling	Defense
20	9	18	14
Ambev	Alliance One Int.	Boyd Gaming Corporation	BAE Systems
Anheuser-Busch Inbev	Altria Group	Caesars Ent. Group	General Dynamics
Big Rock Brewery	British American Tobacco	Century Casinos	Honeywell International
Brown-Forman Corporation	Littlefield Corp.	Churchill Downs	L-3 Communications
Carlsberg A/S	Phillip Morris Int.	Full House Resorts	Lockheed Martin
Castle Brands	Reynolds American	Golden Entertainment	Northrop Grumman
Compania Cervecerias Unidas	Schweitzer Mauduit	International Game Tech.	Olin Corporation
Constellation Brands	Universal Corporation	Isla of Capri Casinos	Raytheon
Craft Brew Alliance	Vector Group	Ladbrokes Coral Group	Rockwell Collins
Diageo		Las Vegas Sands	Smith & Wesson
Heinekin NV		Melco Crown Ent.	Sturm Ruger & Co.
Kirin Holdings Company		MGM Resorts International	TASER International
Molson Coors Brewing		Monarch Casino & Resort	The Boeing Company
Pernod Ricard		Nevada Gold & Casinos	United Technologies
SAB Miller		Penn National Gaming	
The Boston Beer Company		Pinnacle Entertainment	
Treasury Wine Estates		Transworld Corp.	
Truett-Hurst		Wynn Resorts	
Vina Concha y Toro			
Willamette Valley Vineyards			

TABLE 2A: Descriptive Statistics

	ViceFund	BoozeFund	SmokeFund	GambleFund	BoomFund
No. of obs.	5034	5034	5034	5034	5034
Mean Return	0.0314	0.0307	0.0425	0.0376	0.0286
Std. Deviation	1.0081	1.1953	1.6153	1.2607	1.5477
Skewness	0.0027	0.1624	0.1133	-0.4695	0.3977
Kurtosis	8.5366	9.0371	12.3676	6.8534	9.4305

TABLE 2B: Correlation Coefficient Matrix among Independent Variables

Notes: This table lists the Pearson correlation coefficients between the independent variables from the fama-French Five-Factor model and the Momentum factor from the Carhart model.

	r_m-r_f	SMB	HML	MOM	RMW	CMA
r_m-r_f	1					
SMB	0.0314	1				
HML	-0.0216	0.0598	1			
MOM	-0.2648	0.0232	-0.3423	1		
RMW	-0.4157	-0.309	0.1162	0.1561	1	
CMA	-0.3347	0.059	0.478	0.0854	0.3002	1

TABLE 3: ViceFund Regression Results

Notes: I regress the returns as follows: $r_{pt} - r_{ft} = \alpha_p + \beta(r_{mt} - r_{ft}) + \gamma_p SMB + \delta_p HML + \rho_p RMW + \tau_p CMA + \varepsilon_t$ where $r_{pt} - r_{ft}$ is the return on the Vicefund net of the risk-free rate of return, and $(r_{mt} - r_{ft})$ is the market risk premium. SMB and HML are the Fama-French size and book-to-market (B/M) factors. MOM is the Carhart momentum factor. RMW and CMA are the Fama-French profitability and investment factors from the new Five-Factor model and ε is a well-behaved error term. The sample period ranges from October 1996 to October 2016. Newey-West standard errors are in parentheses. The symbols ** and *** represent significance at the 5% and 1% levels, respectively.

	(i)	(ii)	(iii)	(iv)
	CAPM	**FF Three-Factor**	**Carhart**	**FF Five-Factor**
r_m-r_f	0.588***	0.592***	0.615***	0.736***
	(0.0130)	(0.0128)	(0.0127)	(0.0101)
SMB		-0.166***	-0.175***	-0.049***
		(0.0239)	(0.0243)	(0.0190)
HML		0.152***	0.207***	-0.053**
		(0.0270)	(0.0264)	(0.0217)
MOM			0.107***	
			(0.0196)	
RMW				0.510***
				(0.0292)
CMA				0.483***
				(0.0342)
Alpha	0.029***	0.028***	0.025**	0.010
	(0.0098)	(0.0097)	(0.0097)	(0.0086)
R^2	0.521	0.540	0.549	0.635
obs.	5,034	5,034	5,034	5,034

TABLE 4: BoozeFund Regression Results

Notes: I regress the returns as follows: $r_{pt} - r_{ft} = \alpha_p + \beta(r_{mt} - r_{ft}) + \gamma_p SMB + \delta_p HML + \rho_p RMW + \tau_p CMA + \varepsilon_{,t}$ where $r_{pt} - r_{ft}$ is the return on the BoozeFund net of the risk-free rate of return, and $(r_{mt} - r_{ft})$ is the market risk premium. SMB and HML are the Fama-French size and book-to-market (B/M) factors. MOM is the Carhart momentum factor. RMW and CMA are the Fama-French profitability and investment factors from the new Five-Factor model and ε is a well-behaved error term. The sample period ranges from October 1996 to October 2016. Newey-West standard errors are in parentheses. The symbols ** and *** represent significance at the 5% and 1% levels, respectively.

	(i)	(ii)	(iii)	(iv)
	CAPM	**FF Three-Factor**	**Carhart**	**FF Five-Factor**
r_m-r_f	0.516***	0.523***	0.543***	0.704***
	(0.018)	(0.017)	(0.018)	(0.016)
SMB		-0.395***	-0.402***	-0.251***
		(0.036)	(0.036)	(0.031)
HML		0.076**	0.124***	-0.185***
		(0.039)	(0.040)	(0.034)
MOM			0.091***	
			(0.025)	
RMW				0.631***
				(0.045)
CMA				0.625***
				(0.051)
Alpha	0.017	0.019	0.016	-0.003
	(0.014)	(0.014)	(0.014)	(0.013)
R^2	0.386	0.428	0.432	0.535
obs.	5,034	5,034	5,034	5,034

TABLE 5: SmokeFund Regression Results

Notes: I regress the returns as follows: $r_{pt} - r_{ft} = \alpha_p + \beta(r_{mt} - r_{ft}) + \gamma_p SMB + \delta_p HML + \rho_p RMW + \tau_p CMA + \varepsilon_{,t}$ where $r_{pt} - r_{ft}$ is the return on the SmokeFund net of the risk-free rate of return, and $(r_{mt} - r_{ft})$ is the market risk premium. SMB and HML are the Fama-French size and book-to-market (B/M) factors. MOM is the Carhart momentum factor. RMW and CMA are the Fama-French profitability and investment factors from the new Five-Factor model and ε is a well-behaved error term. The sample period ranges from October 1996 to October 2016. Newey-West standard errors are in parentheses. The symbols ** and *** represent significance at the 5% and 1% levels, respectively.

	(i)	(ii)	(iii)	(iv)
	CAPM	**FF Three-Factor**	**Carhart**	**FF Five-Factor**
r_m-r_f	0.517***	0.524***	0.561***	0.704***
	(0.025)	(0.024)	(0.024)	(0.024)
SMB		-0.315***	-0.330***	-0.193***
		(0.046)	(0.046)	(0.045)
HML		0.150***	0.239***	-0.135***
		(0.050)	(0.052)	(0.047)
MOM			0.172***	
			(0.036)	
RMW				0.559***
				(0.066)
CMA				0.719***
				(0.082)
Alpha	0.049**	0.050**	0.044**	0.028
	(0.021)	(0.021)	(0.021)	(0.020)
R^2	0.257	0.275	0.283	0.334
obs.	5,034	5,034	5,034	5,034

TABLE 6: GambleFund Regression Results

Notes: I regress the returns as follows: $r_{pt} - r_{ft} = \alpha_p + \beta(r_{mt} - r_{ft}) + \gamma_p SMB + \delta_p HML + \rho_p RMW + \tau_p CMA + \varepsilon_{,t}$ where $r_{pt} - r_{ft}$ is the return on the Gamblefund net of the risk-free rate of return, and $(r_{mt} - r_{ft})$ is the market risk premium. SMB and HML are the Fama-French size and book-to-market (B/M) factors. MOM is the Carhart momentum factor. RMW and CMA are the Fama-French profitability and investment factors from the new Five-Factor model and ε is a well-behaved error term. The sample period ranges from October 1996 to October 2016. Newey-West standard errors are in parentheses. The symbol *** represents significance at the 1% levels.

	(i)	(ii)	(iii)	(iv)
	CAPM	**FF Three-Factor**	**Carhart**	**FF Five-Factor**
r_m-r_f	0.747***	0.747***	0.750***	0.850***
	(0.013)	(0.013)	(0.014)	(0.014)
SMB		0.090***	0.089***	0.199***
		(0.029)	(0.029)	(0.026)
HML		0.139***	0.145***	0.023
		(0.027)	(0.026)	(0.026)
MOM			0.012	
			(0.019)	
RMW				0.448***
				(0.040)
CMA				0.225***
				(0.043)
Alpha	0.017	0.015	0.014	0.002
	(0.012)	(0.012)	(0.012)	(0.012)
R^2	0.538	0.545	0.545	0.578
obs.	5,034	5,034	5,034	5,034

TABLE 7: BoomFund Regression Results

Notes: I regress the returns as follows: $r_{pt} - r_{ft} = \alpha_p + \beta(r_{mt} - r_{ft}) + \gamma_p SMB + \delta_p HML + \rho_p RMW + \tau_p CMA + \varepsilon_{,t}$ where $r_{pt} - r_{ft}$ is the return on the BoomFund net of the risk-free rate of return, and $(r_{mt} - r_{ft})$ is the market risk premium. SMB and HML are the Fama-French size and book-to-market (B/M) factors. MOM is the Carhart momentum factor. RMW and CMA are the Fama-French profitability and investment factors from the new Five-Factor model and ε is a well-behaved error term. The sample period ranges from October 1996 to October 2016. Newey-West standard errors are in parentheses. The symbols * and *** represent significance at the 10% and 1% levels, respectively.

	(i)	(ii)	(iii)	(iv)
	CAPM	**FF Three-Factor**	**Carhart**	**FF Five-Factor**
r_m-r_f	0.571***	0.575***	0.608***	0.686***
	(0.025)	(0.025)	(0.024)	(0.025)
SMB		-0.046	-0.058	0.047
		(0.043)	(0.043)	(0.044)
HML		0.242***	0.321***	0.087*
		(0.045)	(0.044)	(0.052)
MOM			0.152***	
			(0.029)	
RMW				0.402***
				(0.062)
CMA				0.364***
				(0.072)
Alpha	0.031	0.029	0.024	0.015
	(0.019)	(0.019)	(0.019)	(0.019)
R^2	0.309	0.320	0.327	0.344
obs.	5,034	5,034	5,034	5,034

Table 8: Bull Market Results:

Notes: I regress the returns as follows: $r_{pt} - r_{ft} = \alpha_p + \beta (r_{mt} - r_{ft}) + \gamma_p SMB + \delta_p HML + \rho_p RMW + \tau_p CMA + \varepsilon_{,t}$ where $r_{pt} - r_{ft}$ is the return net of the risk-free rate of return, and $(r_{mt} - r_{ft})$ is the market risk premium. SMB and HML are the Fama-French size and book-to-market (B/M) factors. RMW and CMA are the Fama-French profitability and investment factors from the new Five-Factor model and ε is a well-behaved error term. The sample period ranges from February 2009 to October 2016. Newey-West standard errors are in parentheses. The symbols *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

	(i)	(ii)	(iii)	(iv)	(v)
	ViceFund	BoozeFund	SmokeFund	GambleFund	BoomFund
r_m-r_f	0.799***	0.720***	0.781***	0.894***	0.799***
	(0.0121)	(0.0175)	(0.0224)	(0.0183)	(0.0259)
SMB	-0.172***	-0.317***	-0.368***	0.101***	-0.102**
	(0.0214)	(0.0313)	(0.0389)	(0.0316)	(0.0463)
HML	-0.238***	-0.280***	-0.314***	-0.159***	-0.199***
	(0.0264)	(0.0380)	(0.0515)	(0.0388)	(0.0539)
RMW	0.362***	0.310***	0.490***	0.368***	0.278***
	(0.0350)	(0.0524)	(0.0653)	(0.0520)	(0.0779)
CMA	0.383***	0.521***	0.707***	0.005	0.300***
	(0.042)	(0.064)	(0.085)	(0.064)	(0.089)
Alpha	0.027***	0.023*	0.037**	0.016	0.034*
	(0.0087)	(0.0132)	(0.0170)	(0.0130)	(0.0197)
R^2	0.786	0.546	0.454	0.712	0.431
obs.	1,928	1,928	1,928	1,928	1,928

Table 9: Bear Market Results:

Notes: I regress the returns as follows: $r_{pt} - r_{ft} = \alpha_p + \beta (r_{mt} - r_{ft}) + \gamma_p SMB + \delta_p HML + \rho_p RMW + \tau_p CMA + \varepsilon_{,t}$ where $r_{pt} - r_{ft}$ is the return net of the risk-free rate of return, and $(r_{mt} - r_{ft})$ is the market risk premium. SMB and HML are the Fama-French size and book-to-market (B/M) factors. RMW and CMA are the Fama-French profitability and investment factors from the new Five-Factor model and ε is a well-behaved error term. The sample period ranges from October 2007 to February 2009. Newey-West standard errors are in parentheses. The symbols *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

	(i)	(ii)	(iii)	(iv)	**(v)**
	ViceFund	BoozeFund	SmokeFund	GambleFund	BoomFund
r_m-r_f	0.748***	0.664***	0.696***	0.859***	0.775***
	(0.023)	(0.043)	(0.060)	(0.035)	(0.071)
SMB	-0.014	-0.077	-0.298**	0.335***	-0.016
	(0.049)	(0.112)	(0.122)	(0.081)	(0.162)
HML	-0.145***	-0.298***	-0.208*	0.054	-0.127
	(0.044)	(0.099)	(0.113)	(0.070)	(0.148)
RMW	-0.024	-0.035	-0.120	0.102	-0.044
	(0.099)	(0.180)	(0.204)	(0.139)	(0.254)
CMA	0.667***	0.795***	0.560***	0.690***	0.623**
	(0.108)	(0.149)	(0.207)	(0.157)	(0.251)
Alpha	0.037	0.033	0.052	0.031	0.032
	(0.037)	(0.056)	(0.072)	(0.053)	(0.085)
R^2	0.855	0.653	0.588	0.798	0.561
obs.	338	338	338	338	338

Appendix

No.	Firm	Ticker	Industry
1	Alliance One International	AOI	Tobacco Products
2	Altria Group	MO	Cigarettes
3	Ambev	ABEV	Beverages-Brewers
4	Anheuser-Busch Inbev	BUD	Beverages-Brewers
5	BAE Systems	BAESY	Defense Products and Services
6	Big Rock Brewery	BRBMF	Beverages-Brewers
7	Boyd Gaming Corporation	BYD	Resorts and Casinos
8	British American Tobacco	BTI	Cigarettes
9	Brown-Forman Corporation	BF-B	Beverages-Wineries and Distillers
10	Carlsberg A/S	CABGY	Beverages-Brewers
11	Castle Brands	ROX	Beverages-Wineries and Distillers
12	Ceasars Entertainment Group	CZR	Resorts and Casinos
13	Century Casinos	CNTY	Resorts and Casinos
14	Churchill Downs	CHDN	Gaming Activities
15	Compania Cervecerias Unidas	CCU	Beverages-Brewers
16	Constellation Brands	STZ	Beverages-Wineries and Distillers
17	Craft Brew Alliance	BREW	Beverages-Brewers
18	Diageo	DEO	Beverages-Wineries and Distillers
19	Full House Resorts	FLL	Resorts and Casinos
20	General Dynamics	GD	Defense Products and Services
21	Golden Entertainment	GDEN	Resorts and Casinos
22	Heinekin NV	HEINY	Beverages-Brewers
23	Honeywell International	HON	Diversified Machinery
24	International Game Tech.	IGT	Gaming Activities
25	Isla of Capri Casinos	ISLE	Resorts and Casinos
26	Kirin Holdings Company	KNBWY	Beverages-Brewers
27	L-3 Communications	LLL	Defense Products and Services
28	Ladbrokes Coral Group	LAD.L	Gaming Activities
29	Las Vegas Sands	LVS	Resorts and Casinos
30	Littlefield Corp.	LTFD	Gaming Activities
31	Lockheed Martin	LMT	Defense Products and Services
32	Melco Crown Entertainment	MPEL	Resorts and Casinos
33	MGM Resorts International	MGM	Resorts and Casinos
34	Molson Coors Brewing Company	TAP	Beverages-Brewers
35	Monarch Casino & Resort	MCRI	Resorts and Casinos
36	New Frontier Media	NOOF	Adult Entertainment
37	Nevada Gold & Casinos	UWN	Resorts and Casinos
38	Northrop Grumman	NOC	Defense Products and Services
39	Olin Corporation	OLN	Winchester Rifles
40	Penn National Gaming	PENN	Resorts and Casinos

41	Pernod Ricard	PDRDY	Beverages-Wineries and Distillers
42	Phillip Morris International	PM	Cigarettes
43	Pinnacle Entertainment	PNK	Resorts and Casinos
44	Playboy	PLA	Adult Entertainment
45	Raytheon	RTN	Defense Products and Services
46	Reynolds American	RAI	Cigarettes
47	Rick's Cabaret International	RICK	Adult Entertainment
48	Rockwell Collins	COL	Defense Products and Services
49	SAB Miller	SBMRY	Beverages-Brewers
50	Schweitzer Mauduit	SWM	Paper Products (Cigarette Papers)
51	Smith & Wesson Holding	SWHC	Defense Products and Services
52	Sturm Ruger & Co.	RGR	Defense Products and Services
53	TASER International	TASR	Defense Products and Services
54	The Boeing Company	BA	Defense Products and Services
55	The Boston Beer Company	SAM	Beverages-Brewers
56	Transworld Corp.	TWOC	Gaming Activities
57	Treasury Wine Estates	TSRYY	Beverages-Wineries and Distillers
58	Truett-Hurst	THST	Beverages-Wineries and Distillers
59	United Technologies	UTX	Defense Products and Services
60	Universal Corporation	UVV	Tobacco Products
61	VCG Holding	VCGH	Adult Entertainment
62	Vector Group	VGR	Cigarettes
63	Vina Concha y Toro	VCO	Beverages-Brewers
64	Willamette Valley Vineyards	WVVI	Beverages-Wineries and Distillers
65	Wynn Resorts	WYNN	Resorts and Casinos