

# Sin Stock Returns

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In Episode 40 of the HBO series “The Sopranos,” Anthony “Tony” Soprano, Sr. (played by James Gandolfini) asks his right-hand man Silvio Dante (played by Steven Van Zandt): “Sil, break it down for ‘em. What two businesses have traditionally been recession-proof since time immemorial?”<sup>1</sup> “Certain aspects of show business and Our Thing,” Sil replies. Viewers of this HBO series knew what Sil meant. “Certain aspects of show business” meant the adult entertainment that was often seen at Tony’s strip establishment, the Bada Bing Club, and “Our Thing” meant organized crime, which involves many activities that exploit the vices of frail humanity.<sup>2</sup>

Of course, considering the source, the preceding quote may not have been the most credible one to use as an opening for this article. Yet, ask any vice stock investor: What is the major difference in investing in vice versus “regular” stocks? The first response is that vice investors or vice stocks generally have a “bad reputation.” Society, using current moral standards, does not approve of the products or services that these firms provide or of investors who profit from activities that exploit others’ habit-forming, or sin-seeking, behaviors.<sup>3</sup>

It is often hard to differentiate among the social implication of a product, image of the producing firm, economic value of the stock, and integrity of the investor. When the

product is controversial or is not accepted by the majority of society, the producing entity is viewed as being involved in a dubious business. Whether the economic entity is legitimate or involved in organized crime depends on the legality of its product. A firm making a “bad” product is often presumed to be a “bad” firm. The negative publicity of a bad firm is further equated to a bad stock, whose valuation, according to traditional finance theory, should only be determined by its unique properties of risk and return. The further assumption is made that investors in bad stocks of this sort lack character or integrity. This chain reaction starts and ends with misperceptions.

As of this writing, we are not aware of any articles published in peer-reviewed academic journals on the performance of sin stocks; however, several working papers have empirically investigated their performance. Hong and Kacperczyk [2007], in the first draft of their article released in June 2005, analyzed the impact of society’s framework of morals and traditional laws on the sin stock market. They hypothesized that sin stocks in the U.S. market are followed less frequently by institutional investors and analysts than the stocks of other companies for one or both of the following reasons—sin companies face greater litigation risk and/or they are neglected because of social norms. Hong and Kacperczyk found that their sample of 184 sin stocks

(in the gaming, tobacco, and alcohol industries) outperformed the market on a relative basis after taking into account well-known predictors of stock returns, and that the outperformance was more attributable to the neglect effect than to litigation risk. Kim and Venkatachalam [2006] also found superior performance for the 111 sin stocks they analyzed, but concluded that the sin stocks' superior performance was due to a high quality of financial reporting that made them attractive to a wide group of investors and analysts. Both of these studies focused on U.S. publicly traded stocks. In contrast, Salaber [2007] investigated sin stocks in three industries in 18 European countries. She found that sin stock returns depend on legal and cultural characteristics, such as religious preference, level of excise taxation, and degree of litigation risk; for example, Protestants tend to be more "sin averse" than Catholics and require a significant premium for investing in sin stocks.

In the popular press, a wealth of anecdotal evidence exists of several well-known sin stocks that have produced impressive returns (Ahrens [2004], Ezell [2005], Lemieux [2003], and Waxler [2004]). In practice, some evidence suggests that sin stocks have earned higher risk-adjusted returns than the market. The Vice Fund, launched in 2003, invests in only alcohol, tobacco, and gaming companies in the U.S. and foreign countries. This fund has earned an annualized return in excess of 20%.<sup>4</sup>

In this article, we present empirical evidence that shows sin stocks have outperformed the market on a risk-adjusted basis. Compared to the extant literature, our study includes a larger and more comprehensive database (both U.S. and non-U.S. firms) and covers six commonly recognized sin industries. The results also add to the literature of how social values affect stock values.

## SOCIETAL VIEWS OF SIN

Before satellite radio, Howard Stern had 12 million daily listeners. Now his program is the number one-rated show on satellite radio. Jerry Springer had an 8.1 Nielsen Rating (8.1% of the television viewing audience), which approximated 13 million viewers at his television show's peak in 1998. At one time Jerry Springer had higher ratings than Oprah. But how many people would admit they listen to Howard Stern or watch Jerry Springer? In a survey asking whether investors use their personal values in pricing stocks, Dukes [2008] found that the most likely reason for not investing in sin stocks is "because

it won't look good." An Environics public opinion poll for Environment Canada suggested that shareholders favor "social and environmental performance" (Lemieux [2003]). Of course, the validity of the responses could be questioned because of the desire of those polled to respond in a politically correct fashion, and not necessarily putting their money where their mouths are. Regardless of the implications of these opinion studies, currently only 5% of Canadian stocks and 10% of U.S. stocks are considered socially responsible investments (SRI).<sup>5</sup>

Still, to some investors, avoiding even the appearance of impropriety is more important than making money. Consequently, the sin stock subset of the market is singled out, or segmented, due to its perceived failure to conform to social standards. This segmentation emerges naturally. Certain investors may not be willing to own the stocks because doing so would conflict with their value system. The exclusion of sin stocks from these investors' investable universe is equitable because individual investors are free to make their own investment decisions and use their money as they wish to uphold their personal values.

Similar logic cannot be applied to institutional investors. Institutional portfolios, such as endowment funds, pension funds, and foundations, are managed by fiduciaries who operate under investment guidelines or policy statements with the mandate to make money. In 2003, the California Public Employees' Retirement System (CalPERS) announced that it would no longer invest in developing countries that fail to meet its SRI standards, even if this would shave off three percentage points from the performance of its emerging market portfolios. The Canadian Pension Plan Investment Board also lashed out against executive stock options, putting taxpayers' money where its corporate governance mouth is.<sup>6</sup>

When trustees impose social values as constraints on investments, the question should be asked if the imposition of noneconomic values is their decision to make. Even if it is, how can a handful of people envision the value system of the entire group? Or further yet, should the majority value prevail? As Friedman [1970] pointed out, one advantage of a free economy is that minorities, however unpopular, find businesses that will cater to their tastes. There is no reason why any minority should impose their own value system, even as the moral majority, on the rest of society.

Regardless of the answers to these questions, the demand for sin stocks is restricted to a unique subset of

investors who are willing, or allowed, to bear the social cost. Market pricing is not only determined by traditional risk and return measures, but more appropriately, by firm-specific factors and changes in social values.

Because many of these issues are not yet resolved we examine the relationship between the economic value, or stock value, of a firm and the underlying social value it represents. To this end, we look at a unique group of firms that are generally considered extreme and controversial in their conformity to social standards—sin stocks. Our findings have important implications for conventional asset pricing models, the justification of regulations, and the need for imposing social constraints on financial investments.

We first address the question of whether an investor's view about the social value of a firm is relevant in determining the firm's economic value. The creation of an uninvestable subuniverse of stocks as a result of an investor's social norms directly contradicts the conventional asset pricing models. For example, in the capital asset pricing model (CAPM), the expected return of a stock is determined by a single-factor market risk premium. As the market aggregates individual utility functions, equilibrium market pricing, or expected return, is independent of the value an investor places on a particular stock (Sharpe [1964]). In other words, individual values do not play a role in pricing stocks, according to conventional pricing models.

However, in light of increasing evidence of stock market anomalies, as defined by the financial models, behavioral and social scientists have begun to entertain the notion that economic values can be affected by non-economic factors (see DeBondt and Thaler [1985] and Shefrin [2000]). The impact of social, moral, political, legal, and religious environments on financial markets has been examined in many ways. Since 1980, the call for a business conscience regarding ethical and moral values has created the notion of SRI. Although not everyone agrees on what constitutes social responsibility,<sup>7</sup> almost 10% of the U.S. stock market's value is currently classified as SRI. The financial performance that underlies social responsibility has generated an obvious interest on the part of investors, but the empirical evidence that supports investment performance is far from conclusive. Theoretically, a true SRI should earn lower returns than a non-constrained investment.

After September 11, 2001, a few studies investigated the financial market impact of terrorism. Karolyi [2008]

found preliminary evidence that the market does not seem to price terrorism-related risk into a stock's value. This is consistent with the findings of researchers who examined the impact on the performance of tobacco stocks after the emergence of tobacco-related lawsuits around 1990, and who concluded that tobacco stocks have earned positive risk-adjusted returns. In addition, some evidence shows that, in the case of sin stocks, investors are willing to pay an economic opportunity cost by foregoing higher returns to uphold their social norms (Hong and Kacperczyk [2007]).

The issue of whether social values are relevant in asset pricing goes beyond the walls of academia. Legislators formulating economic policies are often required to reflect a society's current value system. According to Karolyi [2008], 20 state legislatures have disallowed their state's pension funds from investing in certain terrorism-related regions. More and more nonprofit institutions, such as endowments, foundations, and universities, have declared an explicit position on the issue of SRI in their investment policy statements.

The relevance of moral value and market pricing also has important implications for social policy making. If no relationship exists between investors' subjective value and security pricing, then social policy cannot be implemented via financial markets. In contrast, if deviations from social and moral standards decrease economic values, it implies that social policies have been enforced in financial markets. Therefore, the issue becomes: Is it cost effective or appropriate to use financial markets to make social policies?

## WHAT IS SIN?

Sin is defined in the *Random House Unabridged Dictionary* (2nd edition) as "any act regarded as such a transgression, especially a willful or deliberate violation of some religious or moral principle" and by theology as "deliberate disobedience to the known will of God."<sup>8</sup> Clearly, "sinful" behavior is often dictated by the religious environment in which the economic behavior is performed. Different societies at different times have had various disagreements with respect to what is considered acceptable behavior. A good example of this is the way the Western and Eastern cultures view debt. In the Western world, incurring debt is considered a sound business practice and even rewarded with government tax incentives. But for thousands of years in the Eastern

culture, the act of borrowing money, which implies the inability to live within one's means, is viewed as "losing face."

In most Arab countries, the Koran bans giving or receiving interest.<sup>9</sup> Consequently, Arab investors can only receive dividend income, not interest income. This would also explain why the traditional Western banking industry, considered a sin industry, should not exist in the eyes of those who follow the teachings of the Koran. In the sixth century, Pope Gregory handed down a list of "seven cardinal vices." After another 1,500 years, on March 11, 2008, the Vatican issued a list of seven "social" sins, which includes the commission of bioethical violations, amassing excessive wealth, drug abuse, littering, genetic tampering, widening the divide between rich and poor, and creating poverty.<sup>10</sup> In short, each society defines its own limits in terms of responsibility, morality, and legality, and, thus, defines sin investments—corporations which provide products or services to gratify sin-seeking behavior—differently.

Because the standard for what constitutes vice changes over time and among societies, the definition of what constitutes a controversial industry is itself controversial. Due to the timing of our study, our classification of sin stocks does not fully reflected the recent wisdom of the Vatican, but does benefit from agreement among most contemporary cultures that the consumption of alcohol and tobacco, and engaging in gaming, are sinful behaviors. Almost all previous serious studies (see, for example, Hong and Kacperczyk [2007] and Salaber [2007]) included these industries. It is less clear whether the weapons industry, including guns and defense-related products, qualifies as a sin industry. Investors' religious or moral views regarding pro-life versus pro-choice impact whether they view a company that makes products relating to abortion, birth control, bioethical concerns, and genetic alterations as sinful. And whenever and wherever pornography and strip clubs are protected by the Constitution or prostitution is legalized, adult entertainment becomes a legitimate business and an "obvious" sin industry. Ultimately, we included the adult entertainment, alcohol, biotech, gaming, tobacco, and weapons industries in our study of sin stocks.

While the validity of using market pricing to reflect social norms is debatable, the reality of whether financial markets price stocks partially in terms of social values remains an unanswered question. Several rationales could

explain why sin stocks might or might not produce risk-adjusted returns that differ from the market.

## WHY SHOULD IT MATTER?

The irrelevance proposition, which helps relate market pricing and social values, asserts that a stock's expected return is determined only by the market risk premium and not by individual preferences or noneconomic factors. This proposition is based on conventional financial asset pricing models as discussed in the previous section. This school of thought questions why the financial market should be a forum for social policies. Legislators make laws and the judicial system enforces them, religions define moral standards and people are bound by the resulting values through social pressure. Financial markets facilitate the creation of economic values and are designed to maximize the wealth of the participants.<sup>11</sup> If stock prices reflect social values, is the use of economic functions to perform social functions the most efficient way to allocate resources?

## IT COSTS TO BE GOOD

A cost is associated with having principles. The cost argument asserts that there is a positive economic cost to uphold and execute social values in economic activities. The first layer of cost is at the firm level; production processes which are friendly or "sustainable" to the environment are not cheap at either the early stage of research and development or at the stage of execution. Furthermore, explicit out-of-pocket corporate expenses are required to maintain conformity with social standards, such as defective warning disclosures, product recalls, pollution control, environmental cleanup, and so on. In anticipation of possible deviations from future social standards, firms often insure themselves against product liability lawsuits. Researchers are starting now to examine the cost of social responsibility or virtues (Kritzman, Myrgren, and Page [2008]).

A second layer of cost, at the stock level, is a subtle cost that takes the form of underperformance, which results from investors' values constraining their investable universe. Economic intuition suggests that if an optimal portfolio is obtained under the mean-variance framework from a subuniverse that has been screened by *any* constraints, it will underperform, on a risk-adjusted basis, a portfolio without constraints (Adler and Kritzman [2008]).

In this case, if sin stocks are removed from the investable universe, the resulting portfolios should generate lower returns. By definition, the stocks excluded will earn higher returns.

## SIN IS A MONOPOLY

Sin industries have significant barriers to entry. Strict ordinances, rules, regulations, and multi-jurisdictional laws exist to restrict the existence and operation of sin industries. For example, to open an adult or gaming business, a firm must undergo tedious scrutiny, from getting permits and licenses and complying with zoning restrictions, to enduring public hearings. Even in the U.S., the alcohol and tobacco industries were owned and operated by the government for quite a long time. Even today, in the majority of the world, these two industries remain government monopolies. The very high cost of research and development in the pharmaceuticals and weapons industries has become a natural economic barrier to new entry for firms of this type. These industries are also closely associated with the politics of the day and, as such, are vulnerable to shifting political positions on stem cell research, birth control, and the desire to go to war. Traditionally, some of these controversial industries have been associated with organized crime, mainly due to their extremely high profit potential. The bottom line is that firms in the sin industries, which have managed to exist and survive against all odds, have earned their monopolistic power and should be compensated with an excess “rent” in return.

## HEADLINE RISK

Headline risk refers to the risk that a major news story about a company, true or not, will adversely affect the value of its stock. Sin industries are controversial. They are constantly under the social microscope of value judgments, so that the news is almost always interpreted as bad. Understandably, the market perception is that firms which do not abide by social norms live with permanently negative headline risk. Here is an example:

“...Prudential Equity Group maintained a ‘neutral weight’ rating on Pfizer after Canadian news reports surfaced linking its arthritis drug Celebrex with cardiovascular side effects...,” Prudential said. “That being said, ‘headline risk’ does create ‘commercial

risk’ when it comes to something like the COX-2 category of drugs; if patients taking Celebrex read negative headlines, especially following the withdrawal of Vioxx, then they may drop off therapy out of fear. The product could nonetheless run into commercial headwinds as pieces like this new Health Canada report muddy the picture...” (Forbes.com, November 4, 2004).

Headline risk, combined with the fact that sin industries are also prone to litigation risk, leads to a permanent discount in valuation. Sin stocks are, therefore, expected to underperform.

## JUST DON'T LIKE THE STOCKS

Investors may simply like or dislike certain stocks. Because standard financial models fail to incorporate subjective feelings, such as *affect*, Statman [1999] introduced a behavioral asset pricing model that includes negative affect factors, such as sin characteristics. Statman, Fisher, and Anginer [2008] further tested a similar heuristic model which includes a subjective risk factor. The expected return is determined by the subjective feeling or the preference of investors. To measure the affect of stocks, they used *Fortune Magazine* respondents’ subjective preference rating of admired versus spurned stocks. They found evidence that the returns of admired stocks are lower than the returns of spurned stocks. They also hypothesized that the positive affect of a stock could be attributed to the prestige or social responsibility associated with that firm, and that the negative affect of a stock could result from the perception that the company does not conform to social values. As such, a sin stock has a high level of subjective risk and thus requires a higher expected return.

## EMPIRICAL STUDY

In this section, we describe our study sample and explain our findings.

### Sin Sample

Any empirical investigation of the performance of sin stocks begins with the difficult task of identifying and defining a sin stock. In this study, we used the following procedure to obtain a sample of sin stocks across 21 countries for the period from January 1970 to June 2007.

From DataStream, we identified all (dead or alive) exchange-traded stocks classified in the six industries of alcohol, tobacco, defense, biotech, gaming, and adult services.<sup>12</sup>

The creation of the sample of sin stocks involved a systematic process of identifying product lines and revenue breakdowns for each company. We included a company only if the revenue obtained from the six sin product categories we selected exceeded more than 30% of the company's total revenue.<sup>13</sup> Each sin industry includes both direct and peripheral product/service providers. For example, while all companies that operate casinos would obviously be considered sin investments, so would companies that make products that facilitate gambling behavior, such as slot machines, cards, dice, card counters, and so on. Both types of companies would be included in our sample.

The classification procedure became much more difficult for companies in the weapons (defense) and pharmaceuticals industries. Most companies in the defense industry make commercial passenger airplanes in addition to weapons, which muddies the waters of categorization. Similarly, certain controversial drugs, such as the abortion pill, may represent only a small portion of a company's revenue. Classifying a particular drug or defensive weapon as a sin product obviously requires a subjective value judgment. In those cases, we relied on reasonable common sense since it is exactly this common value that we were looking for. The issue we were interested in was how the "average" investor perceives the social value that a firm's product represents. Furthermore, how does the average investor react to social value in the mechanism of market pricing? We avoided using complicated or nontrivial procedures, beyond reasonable first impressions, to over-identify a firm's qualification as providing sin products.

Previous studies—Hong, Kubik, and Stein [2004]; Hong and Kacperczyk [2007]; and Salaber [2007]—did not include adult entertainment services in their sample due to the lack of clear industry classifications. We noticed and identified that most adult entertainment firms, due to their sale of food and alcohol, are often classified as part of the restaurant industry. This would include pubs, bars, and clubs which offer sexually related services. Using similar logic, we examined the traditional publishing or entertainment industry to identify firms which publish sexual material such as books, magazines, movies, videos, and sexual facilitators. In each case, we had to go

through the product description of each company in order to make a proper classification. Exhibit 1 provides a sample of product descriptions in each sin industry used in our study.

Exhibit 2 reports the distribution of the number of sin stocks by country and by industry in our original (preliminary) sample and our adjusted sample. The sin universe used in our study, which consists of 308 stocks, is larger and more comprehensive than samples used in previous studies. Our first sample was preliminary because we had to make an adjustment for liquidity in order to have an investable sample. Specifically, we removed a stock from the sample if 1) its average price was less than a USD 5 equivalent during the first month after its initial public offering or 2) its average daily trading volume for the previous month was at least 30,000 shares or USD 150,000 in trading value. We included the liquidity screen simply to make our sample investable. Our conclusions and the performance comparisons are not sensitive to this liquidity screen. From our original, or preliminary, sample of companies, the adjustment for liquidity resulted in the removal of 41 companies. Hence, our investable sample (i.e., our investable universe) consists of 267 companies. The distributions of these companies by country and by sin industry are shown in Exhibit 2.

Given the length of the period covered, January 1970 to June 2007, we were concerned with the delisting and corporate actions of companies in our sample. When the stock of a company was delisted, efforts were taken to correct for corporate actions in order to compute realistic holding period returns.

### Historical Return Performance

For our investable sample of 267 companies, we computed historical returns over various holding periods. Since the sample covers 21 national markets, relevant market index returns were used for comparison purposes. Because each stock had a unique starting or ending time in our sample, the market index in the stock's respective national stock exchange was matched with the identical time period of the individual stock's price history. In Exhibit 3, an average sin stock produced a daily return of 0.076%, a monthly return of 1.64%, and an annual return of 19.02%, while the average stock market produced an average annual return of 7.87% between January 1970 and June 2007. The result is strikingly uniform.<sup>14</sup> Every

## EXHIBIT 1

### Company Descriptions in Sin Industries

Sin Industry	Products & Services
Adult Services	Provides subscription-based adult entertainment Provides adult products and online entertainment Provides dating and chat services Owns and operates adult-themed clubs Manufactures and sells adult products Provides adult media content Holding company with an adult-themed division
Alcohol	Produces malt for breweries Produces cork stoppers for wine Produces and distributes wine Owns and operates establishments that sell alcohol Manufactures and distributes alcoholic beverages Manufactures ethanol used in liquor Imports foreign alcohols Holding company with an alcohol division Engages in retailing and brewing beer Distills liquors Designs bottles for liquor and wine
Biotech	Provides tissue engineering and gene therapy Provides biomedical research of genome applications Conducts animal testing and creates gene-modified mice Creates injectable aesthetic products Experiments with animal genes for producing proteins Conducts genetic testing and genome research Conducts nanotechnology research for treatment of STDs Conducts stem cell-based research
Defense	Produces products for military use Produces firearms Holding company with a firearms division Creates software applications used for the military
Gaming	Involved in aspects of gambling and operates bars Provides digital fortune-telling content Supplies and/or produces gambling-related products Owns and/or operates establishments that allow gambling Conducts gambling servicing
Tobacco	Makes paper used to wrap various parts of the cigarette Develops methods to reduce toxins in tobacco Produces tobacco-based products Sells pipes, rolling tobacco, and lighters Holding company with a tobacco division

sin industry in our study produced annual returns of more than 13%.

In Exhibit 4, the total returns range from a low of 13.45% for Alcohol to a high of 33.50% for Gaming. A similarly impressive pattern is also observed for sin stocks in the various national markets. Exhibit 5 shows the range

of returns for sin stocks across 21 countries. The lowest annual return earned by sin stocks was 6.55% in Taiwan and the highest annual return earned was 27.46% in the U.S. In 16 of the 21 countries, sin stocks produced double-digit annual returns.

**EXHIBIT 2**  
**Sin Sample Description**

Country	Original Sample	Investable Sample	Industry	Original Sample	Investable Sample
Australia	38	34	Adult Services	22	13
Belgium	5	4	Alcohol	118	109
Canada	7	6	Weapons	21	18
Denmark	3	3	Gaming	106	94
Finland	3	1	Biotech	19	15
France	25	23	Tobacco	22	18
Germany	5	5			
Hong Kong	8	8			
Italy	5	3			
Japan	41	36			
Korea	15	12			
Netherlands	5	3			
Norway	3	1			
Portugal	3	1			
Singapore	3	2			
Spain	6	6			
Sweden	6	5			
Switzerland	2	1			
Taiwan	1	1			
United Kingdom	48	42			
United States	76	70			
Total	308	267		308	267

**EXHIBIT 3**  
**Sin Portfolio Returns, 1970–2007**

	Daily Return	Std. Dev.	Monthly Return	Std. Dev.	Annual Return	Std. Dev.
Sin Universe						
Total Return (%)	0.076 (9.80)*	0.77	1.642 (7.87)*	4.46	19.02 (7.65)*	15.31
Market Return	0.032 (4.46)*	0.69	0.695 (3.71)*	3.84	7.87 (3.32)*	14.09
Excess Return1	0.044 (4.05)*	0.45	0.947 (4.16)*	3.74	11.15 (3.51)*	14.55
Excess Return2	0.053 (6.17)*	0.42	0.960 (5.77)*	3.95	13.71 (5.78)*	10.31

Note: Total return is measured by the holding period return over the time interval. Market return is the national market index return where each stock is traded. Excess return1 is computed as the difference between the stock return and the market return. Excess return2 is the excess stock return over a beta-adjusted return. The four returns reported in this exhibit are first computed at the individual stock basis and then averaged on an equal-weighted basis across all stocks in the universe. The t value is in parentheses. \* and \*\* denote significance at the 1% and 5% levels, respectively.



## EXHIBIT 4

### Sin Industry Stock Returns, 1970–2007

Industry	Daily Return	<i>t</i> -value	Monthly Return	<i>t</i> -value	Annual Return	<i>t</i> -value
<b>Adult Services</b>						
Total Return (%)	0.073	(2.44)*	1.58	(2.69)*	18.26	(2.99)*
Market Return	0.034	(3.35)*	0.73	(3.45)*	8.30	(3.30)*
Excess Return1	0.039	(2.54)*	0.85	(2.74)*	9.96	(3.08)*
Excess Return2	0.003	(0.51)	0.12	(0.99)	1.40	(1.89)**
<b>Alcohol</b>						
Total Return	0.053	(9.00)*	1.16	(6.48)*	13.45	(4.92)*
Market Return	0.033	(4.55)*	0.71	(3.78)*	8.18	(3.33)*
Excess Return1	0.020	(3.15)*	0.45	(2.88)*	5.27	(2.50)*
Excess Return2	0.031	(4.99)*	0.67	(3.79)*	7.89	(3.59)*
<b>Defense</b>						
Total Return	0.129	(4.13)*	2.82	(4.01)*	33.06	(3.89)*
Market Return	0.036	(3.42)*	0.76	(3.38)*	8.51	(3.33)*
Excess Return1	0.093	(2.68)*	2.06	(2.53)*	24.55	(2.50)*
Excess Return2	0.048	(3.56)*	1.04	(4.17)*	12.54	(3.25)*
<b>Gaming</b>						
Total Return	0.135	(3.51)*	2.92	(3.63)*	33.50	(3.49)*
Market Return	0.029	(3.61)*	0.63	(3.06)*	7.15	(2.82)*
Excess Return1	0.106	(2.75)*	2.29	(3.16)*	26.35	(3.05)*
Excess Return2	0.192	(5.13)*	4.15	(8.44)*	49.15	(9.21)*
<b>Medical</b>						
Total Return	0.100	(2.94)*	2.13	(2.78)*	22.18	(3.25)*
Market Return	0.050	(3.25)*	1.09	(2.86)*	12.55	(3.78)*
Excess Return1	0.050	(2.08)**	1.04	(2.06)**	9.63	(3.16)*
Excess Return2	0.108	(3.22)*	2.35	(3.31)*	27.59	(3.79)*
<b>Tobacco</b>						
Total Return	0.057	(5.90)*	1.24	(5.42)*	22.18	(5.82)*
Market Return	0.029	(3.13)*	0.64	(3.04)*	7.47	(2.85)*
Excess Return1	0.028	(3.21)*	0.60	(3.08)*	14.71	(2.67)*
Excess Return2	0.047	(7.11)*	1.01	(5.29)*	11.99	(3.27)*

Note: Total return is measured by the holding period return over the sample time interval. Market return is the national market index return where each stock is traded. Excess return1 is computed as the difference between the stock return and the market return. Excess return2 is the excess stock return over a beta-adjusted return. The four returns reported in this exhibit are first computed at the individual stock basis and then averaged on an equal-weighted basis across all stocks in each industry. \* and \*\* denote significance at the 1% and 5% level, respectively.

### Excess Returns and Risk-Adjusted Returns

Because our study encompassed a diverse universe of stocks from 21 national markets across a 37-year sample period, we also computed the excess market return (excess return1) and risk-adjusted excess return (excess return2). The excess market return was computed as the difference between the individual stock return and the national

market index return. The risk-adjusted excess return was computed with the standard procedure utilizing the CAPM.<sup>15</sup> Both measures of excess returns are presented in Exhibits 3, 4, and 5.<sup>16</sup>

As can be seen in Exhibit 3, at the portfolio level, both measures indicate an annual excess return between 11.15% and 13.70%. The strong performance was also confirmed in each of the six industries. In Exhibit 4, the

## EXHIBIT 5

### Sin Stock Returns in 21 National Markets, 1970–2007

Country	Annual Return	Market Return	Excess Return1	Excess Return2
Australia	21.12	8.95	12.17	11.13
Belgium	9.76	7.87	1.89**	10.29
Canada	19.24	8.43	10.81	15.57
Denmark	12.64	9.63	3.01	12.65
Finland	17.75	12.28	4.47	4.72
France	18.79	9.48	9.31	2.24
Germany	8.18	7.36	0.82^	6.99
Hong Kong	13.08	12.85	0.23^	2.41
Italy	22.97	10.27	12.70	26.25
Japan	9.50	4.58	4.92	2.40
Korea	21.11	14.57	6.54	18.75
Netherlands	13.80	10.53	3.27	3.14
Norway	20.02	9.50	10.52	8.29
Portugal	9.96	10.94	-0.98^	1.03^
Singapore	26.87	9.10	17.77	7.35
Spain	12.76	9.03	3.73	5.11
Sweden	26.87	11.32	15.55	25.65
Switzerland	21.16	9.52	11.64	22.62
Taiwan	6.55	8.96	-2.41	3.11
United Kingdom	13.02	7.13	5.89	8.19
United States	27.46	8.19	19.27	27.95

*Note:* Total return is measured by the holding period return over the time interval. Market return is the national market index return where each stock is traded. Excess return1 is computed as the difference between the stock return and the market return. Excess return2 is the excess stock return over a beta-adjusted return. The four returns reported in this exhibit are first computed at the individual stock basis and then averaged on an equal-weighted basis across all stocks in each national exchange. Except for the insignificant returns denoted by ^, all other returns are statistically significant at the 1% level (\*) or at the 5% level (\*\*). For the sake of brevity, the t-values are not presented.

annual excess market returns range from 5.27% for Adult Services to 26.35% for Gaming. The risk-adjusted excess return for Adult Services is 1.40% and 49.15% for Gaming. In Exhibit 5, the robust positive excess return is also prevalent among 21 countries. Of the 42 excess return measures, 40 are positive with the exceptions being Portugal and Taiwan, each having only one sin stock.

To examine the robustness of positive excess returns over time, a sin portfolio was created using the investable universe with monthly equal-weighted rebalancing. The daily total return series and excess return series for the sin portfolio were produced by averaging all stock returns in the portfolio for the same day. In Exhibit 6, the annual returns of the sin portfolio between 1970 and 2007 are displayed. During the 37-year study period, the sin portfolio produced negative returns in only 2 years compared to 9 years of negative returns in the overall market. The

sin portfolio also generated double-digit positive returns in 31 of the 37 years in the study. For both excess return measures, the sin portfolio outperformed the relevant market index in 35 of 37 years. Clearly the superior performance of the sin portfolio, in both magnitude and frequency, is robust and uniform across different time periods, industries, and national markets.

The empirical evidence clearly indicates the presence of a return premium, beyond the difference in underlying fundamentals for sin stocks. Barring other unknown and uncontrolled causes, at the onset the difference in returns was associated with the one variable we did control for—different social values. In other words, an economic benefit is associated with investing in the facilitation of sinful consumption. The evidence was also consistent with the general hypothesis that financial market values are associated with social values.

## EXHIBIT 6

### Annual Returns for the Sin Portfolio, January 1970–June 2007

Year	Sin Portfolio	Market Index	Excess Return1	Excess Return2
1970	17.21(%)	6.72(%)	10.49(%)	11.77(%)
1971	23.24	4.80	18.44	12.95
1972	29.32	12.09	17.23	21.15
1973	7.07	-17.08	24.14	18.21
1974	7.68	-25.50	33.18	39.99
1975	42.41	30.12	12.30	33.30
1976	17.78	13.46	4.31	20.96
1977	21.08	-9.36	30.44	12.58
1978	25.17	8.82	16.35	15.68
1979	12.31	10.39	1.92**	10.74
1980	22.70	16.06	6.64	11.23
1981	-0.47^	-1.77**	1.30^	-1.49^
1982	16.85	5.49	11.36	4.61
1983	33.13	19.89	13.24	25.07
1984	14.97	3.47	11.51	4.67
1985	22.42	20.98	1.44^	11.12
1986	28.19	24.59	3.60	22.30
1987	11.38	9.59	1.78**	15.34
1988	23.49	16.23	7.26	-1.04^
1989	18.65	21.67	-3.02	2.55**
1990	5.28	-17.55	22.83	6.52
1991	21.52	13.19	8.33	19.26
1992	15.11	0.43^	14.67	12.63
1993	28.57	20.75	7.82	14.01
1994	4.67	-2.39**	7.07	9.73
1995	10.34	14.34	-4.00	11.11
1996	21.87	15.13	6.74	16.16
1997	21.39	12.12	9.27	7.56
1998	16.12	15.02	1.10^	12.74
1999	42.02	27.64	14.38	-1.15^
2000	18.86	-8.32	27.18	23.10
2001	21.07	-8.47	29.54	22.91
2002	-1.27^	-19.92	18.66	12.40
2003	27.44	20.61	6.83	21.03
2004	26.36	9.96	16.40	12.84
2005	19.33	15.96	3.37	11.67
2006	21.12	14.94	6.19	13.05
2007	8.52	5.14	3.39	3.89

Note: Except for the insignificant returns denoted by ^, all other returns are statistically significant at the 1% level (\*) or the 5% level (\*\*). For the sake of brevity, the t-values are not presented.

## CONCLUSION

In this article, we examine the issue of how social values affect economic values. Specifically, we studied a small subset of the stock universe that has been generally associated with sin-seeking activities, such as consumption

of alcohol, adult services, gaming, tobacco, weapons, and biotech alterations. The sin portfolio produced an annual return of 19%, unambiguously outperforming common benchmarks in terms of both magnitude and frequency. We also identified several likely reasons for the positive excess returns in sin stocks. First, an economic gain might

accrue from not conforming to social standards, as it costs firms both implicitly and explicitly to uphold such standards. The evidence is also consistent with the position that a sin stock is initially undervalued due to the negative affect of the average investor, although previous evidence shows that sin stocks are not underpriced (Salaber [2007]). Ironically, these industries are the hardest to start, most closely monitored, and most severely disciplined by social opinion, but unlike other monopoly businesses, they are the least regulated in terms of pricing. Thus, the positive risk-adjusted returns we find also support the argument that the sin industries which have survived have earned positive monopolistic returns.

Trustees or fiduciaries who develop institutional investment policy statements should fully understand the economic consequences of screening out stocks of companies which produce a product that is inconsistent with their value systems. In addition, they should question if the cost to uphold common social standards is worthwhile. We conclude that no matter how worthy the effort of upholding social values, doing so by screening out sin stocks in investment portfolios is the least effective way to accomplish this goal.

## ENDNOTES

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<sup>1</sup>It seems to have become accepted that sin industries are recession proof. Fabozzi and Ma [2008] showed that the average sin stock beta is around 0.45 and that sin stocks outperformed the general stock market, in particular, during recessions and bear markets.

<sup>2</sup>Glassman [2004] was the first to use this clever analogy to show the relationship between the economy and sin businesses.

<sup>3</sup>Another response to this question is that the demand for many typical vice products, such as alcohol, gaming, tobacco, and adult services, is not sensitive to the state of the economy; people between jobs often consume more of them. Vice investments may therefore be a natural cyclical hedge to the economy.

<sup>4</sup>This performance figure is obtained from the website of the Vice Fund.

<sup>5</sup>Goodman [2002] and Lemieux [2003] both cited similar numbers.

<sup>6</sup>See Lemieux [2003] for details.

<sup>7</sup>Friedman [1970], for example, argues that “[t]he social responsibility of business is to increase its profits.”

<sup>8</sup>The *Catechism of the Catholic Church*, or CCC, is an official exposition of the teachings of the Roman Catholic Church, first published in French in 1992 with the authorization of Pope John Paul II. It has been translated into many other languages, including English, and was an instant bestseller in each language.

<sup>9</sup>The words from Chapter 2, Verse 278, of the Koran are quite clear: “O you who believe! Have fear of Allah and give up what remains of what is due to you of usury.” A better translation would be: “Don’t make money on money.”

<sup>10</sup>The original seven deadly sins are pride, gluttony, lust, anger, greed, and sloth. Ironically, contributing to “excessive wealth” is classified as a social sin and appears to be in direct conflict with the foundation of a free-market economy—maximizing shareholder wealth.

<sup>11</sup>The opponents of socially responsible investments often argue that financial markets, for-profit-making economic entities, are not the forum to make or execute social policies.

<sup>12</sup>The choice of a 30% minimum may appear arbitrary, but our results are robust to the actual cutoff points of revenue proportion.

<sup>13</sup>It is interesting that the historical performance computed from our backtests is very similar to the live performance of the Vice Fund.

<sup>14</sup>We estimated the excess return<sup>2</sup> from the intercept,  $er_i$ , of the following CAPM version:

$$(R_{i,t} - r_{f,t}) = er_i + b_i (R_{m,t} - r_{f,t}) + e_{i,t}$$

where  $R_{i,t}$  is the stock return,  $r_{f,t}$  is the relevant risk-free rate,  $R_{m,t}$  is the relevant market return, and  $b_i$  is the stock beta.

<sup>15</sup>We also used the Fama–French three-factor model in computing excess return. In non-U.S. countries, this involved estimating the monthly value–growth spreads and market-cap spreads over the sample period. The results produced findings similar to the other two excess return measures.

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