



DO THE NICE GUYS GO HOME EMPTY HANDED?

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“It has been my experience
that folks who have no vices
have very few virtues.”
- Abraham Lincoln

I. INTRODUCTION

The financial markets have witnessed an amazing rise in the interest of social and ethical investments during the last decade.¹ This is particularly true for the United States but also for Sweden, Switzerland, the Netherlands and the United Kingdom. Investors worried about respecting their personal moral values have been accompanied by those with a strong social conscience. Political issues like pollution, civil rights and nuclear energy are found to be behind the increasing allocation of capital to ethical investments. At present one dollar out of every eight under professional management in the United States is part of an ethical portfolio² and the amount of capital earmarked for socially responsible investments are constantly increasing all over the world. The strong demand in this field has been nourished by an increasing supply. One of the main instruments of ethical finance is given by ethical mutual funds. Investors in these mutual funds are allowed to impose some constraints to the fund management, based on ethical principles. The general perception has been that these constraints come at the cost of inferior portfolio performance compared to their more conventional peers. This view has its roots in portfolio theory according to which a restricted investment universe should result in a lower risk-adjusted return. Even the best of ethical investment strategies can only be as good as a traditional investment strategy because ethical investment opportunities are a subset of the market portfolio. Therefore, a conventional investment fund will always be able to create the same investment portfolio as an ethical investor, but not vice versa. Another argument frequently posed is that selecting stocks according to screens can be a time-consuming and expensive practise that may eventually have a negative impact on net return.³

However, despite academics and practitioners increasing interest in the financial consequences of ethical investing they have up to this point not been able to find a significant performance gap between ethical and non-ethical portfolios.⁴ In a review of the relevant literature, Schröder (2003) find this result to be well founded and reliable as previous studies are conducted

¹ The U.S. equivalent for ethical investing is Socially Responsible Investing (SRI)

² Geczy, Stambaugh and Levin (2003)

³ Bauer, Derwall and Otten (2003)

⁴ See e.g. Stateman (2000 & 2005), Kreander, Gray, Power and Sinclair (2000) and Bauer, Koedijk and Otten (2002)

using different methods, investigating different time periods and different countries. The hypothesis that ethical funds will under-perform their conventional peers due to the constrained investment universe is therefore rejected.

This paper is a response to the growing body of academic literature on the performance and style characteristics of Socially Responsible Investing. The objective of this study is – unlike most previous studies adding a social objective to investing – not to focus on the financial consequences of investing in securities of socially responsible companies. Instead the objective is to investigate whether investors who choose an opposite investment strategy, i.e. an unethical investment strategy, will benefit from their “sinful” behaviour. More specifically, I study the investing environment of “sin” stocks. Publicly traded companies involved in the production of alcohol, defence, tobacco, and gaming are all categorised as such.

The ongoing trend to not fund operations that promote human vice and instead invest in socially responsible companies has resulted in academics focusing their studies on the consequences of socially responsible investing⁵, thereby overlooking the consequences of excluding companies engaged in sinful activities. With this paper I hope to contribute to the resulting gap in the academic literature.

The aim of this study is twofold. First, the performance of sin stocks in the United States is analyzed. As performance measure I use Jensen’s alpha in a single- and multifactor framework. The performance analysis of sin stocks shows if investors who choose to invest their money in socially irresponsible companies benefit from their sinful behaviour. The second aim is to investigate the risk-return characteristics of sinful investments. This is done by measuring the effects certain market factors such as size, value versus growth or momentum effects have on sin stocks.

In order to find out whether it is beneficiary to invest in sin stocks I will test the following predictions. First, I will investigate whether sin stocks behave like value stocks (stocks with low price-to-book or price-to-earnings ratios) and outperform the market even after their value characteristics and other well-known predictors of stock returns have been taken into consideration. The reasoning behind this is that sin companies face a considerably higher litigation risk because of the impact their businesses may have on individuals alone and society overall. It is assuredly true that the tobacco industry faced a far higher litigation risk before their settlement with state government in

⁵ In 1999 alone, more than \$1 trillion was pulled out of industries that sell products considered damaging to the community - tobacco, gambling, weapons and alcohol - and switched into companies with a cleaner image (U.S. investors pull \$2 trillion out of sin stocks, The Guardian, June 30, 2000)

1997; however, sin companies still face more lawsuits than other businesses. Further, many practitioners believe that sin stocks have lower valuations than the overall market and that they tend to benefit from very conservative accounting because their industries fall under considerable scrutiny from regulators.⁶ Second, if sin stocks generate excess returns as a consequence of certain characteristics identifiable with stocks classified as such, then time-variations in social norms should affect stock prices and therefore the returns attributable to shareholders. Third, I will test the relative importance of litigation risk. Hong and Kacperczyk (2005) have also identified something they call a neglect effect as a potential driver for sin stocks performance. Implicit in this neglect effect is that there is limited arbitrage, i.e. not enough arbitrage capital is brought to bear on sin stocks. In other words there are entrepreneurial investors exploiting the discriminatory taste of other investors, but there are not enough of them and so such tastes have an impact on stock prices. Unfortunately I lack the means necessary to investigate the predictive power of this statement. However, recent undependable evidence in support of this premise is the step rise in socially responsible investing and the shift of capital from socially irresponsible investments into socially responsible investments.

These predictions leaves me with a null hypothesis suggesting that sin stocks do not provide investors with excess returns compared to other stocks, and neither litigation risk nor social norms have an impact on sin stocks performance. The alternative hypothesis suggests that sin stocks outperform other stocks in general and comparable stocks in particular and potential explanations for this out-performance are the effect social norms have on investors' behaviour, higher litigation risk, or a combination thereof.⁷

The main part of my investigation is focused on the time period of 1985-2004. During this time period events took place that allow me to test whether litigation risk has an impact on sin stocks performance. Unfortunately – for the sake of this investigation – no events occurred that gives me the possibility to investigate whether social norms plays a vital role in sin stocks performance. However, as will become apparent in Section II below, tobacco has – unlike other categories of sin stocks – not always been considered sinful. It was not until scientists were able to verify the link between smoking and cancer in the beginning of the 1960s that smoking became a human vice. By looking at stock performance before and after this link was concluded, I hope to be able to identify a pattern for social norms impact on sin stocks.

⁶ See http://moneysense.ca/shared/print.jsp?content=20021127_154845_3424

⁷ To test whether conservative accounting has a positive impact on sin stocks performance is beyond the scope of this paper.

As will be shown below, I find evidence in support of all my predictions. To begin with, sin stocks tend to behave like value stocks (stocks with low price-to-book or price-to-earnings ratios) and have historically outperformed the market. Importantly, I find that even after controlling for a value effect and other well-known predictors of stock returns, sin stocks outperform the market by approximately 6.84 percent per annum. This out-performance (or alpha) benefit from strong statistical significance. Further, I find evidence in support of the prediction that time-variations in social norms have an impact on stock returns. I expect tobacco stocks to look less like value stocks and to not outperform the market before the rise of a smoking norm in the sixties and more like value stocks and to outperform the market after the sixties. This is indeed what my results suggest. Finally, I find that litigation risk might play a part in explaining returns. I find that tobacco stocks performance after the monumental settlement with state governments in June 1997 (a period of substantially reduced litigation risk) was lower than earlier periods. However, these findings are not statistically significant.

This paper proceeds as follows. In Section II, I provide a historical background on sin stocks and describe how I categorize these stocks. Further I give a first look at the performance and characteristics of sin stocks using Sharpe ratios and common style indicators. In Section III, I describe my data more generally. In Section IV, I present the models used to try my hypothesis. In Section V, I present the empirical results. In Section VI, I present potential shortcomings of my investigation and give suggestions on how these could have been avoided. I conclude in section IV. The appendix contains all stocks used in the investigation.

II. SIN STOCKS

The problem with categorising companies as sinful is that sin is a relative expression. Mark Greenberg, manager of the Invesco Leisure fund, a U.S. mutual fund that holds a number of alcohol- and gambling-related stocks said; “Everybody has a different idea of what is sinful. There are some people who don’t like television. There are others who don’t like gaming. And there are probably some people out there who don’t like sport utility vehicles.”⁸ However, there are five categories of businesses that appear frequently in a sinful context. These categories are alcohol, defence, gaming, pornography, and tobacco. The stocks of the companies included in these businesses are often referred to as sin stocks. To study the performance and style of sin stocks I study the most numerous markets for such stocks; the American markets. In this section I will start with providing a brief

⁸ See http://moneysense.ca/shared/print.jsp?content=20021127_154845_3424

history of sin stocks in the U.S. followed by a description of how I categorize these stocks. Finally I will describe why I choose not to include pornography – the sex industry – in my sample.

(i) Background on Sin Stocks

In the United States, pioneer days of late 18th, early 19th century were days of heavy drinking. Alcohol was consumed in much larger quantities than today by the male population.⁹ The temperance movement arose out of concerns that this behaviour was subversive for the individual and society alike.¹⁰ In the U.S., the first temperance societies were established in Massachusetts in the 1810s, and they were led by Protestants. At first, the temperance movement claimed great successes and had by the later half of the 19th century made sure one out of ten Americans (approximately 1.5 million) had taken the abstinence pledge. The temperance movement was also the driving force behind Maine's decision to become the first state to adopt complete prohibition in 1851. Maine's example was followed by 12 other states in the 1850s. However, the temperance movement suffered a huge setback with the Civil War during which all bans except a handful were repealed.¹¹ The revival of the temperance movement came in the mid 1870s with the notorious women's temperance crusades in which thousands of women kneeled, sang and prayed in front of their husbands' and sons' "water-holes" all over the country. This action led to the creation of a new organization, the WCTU (Women Christian Temperance Union) which has played quite an important role in the American women's movement. Even if WCTU and other temperance movements strived for nationwide prohibition, their aim in that second wave were something called local option bills. They gave local (county, city or township) authorities a possibility to institute local bans on sales of alcoholic beverages following a poll taken at given intervals after a specified proportion of the population had signed for it.¹² By 1911, 49 percent of the population were living in so called dry areas and by 1919, the year the 18th amendment was stipulated, 33 states had taken prohibition from a local level into a state-wide level. In 1920 the country turned 'bone-dry'. The 18th amendment stated:

"After one year of the ratification of this article the manufacture, sale, or transportation of intoxicating liquors within, the importation thereof into, or the exportation thereof from the United States and all territory subject to the jurisdiction thereof for beverage purposes is hereby prohibited"¹³

⁹ Rorabaugh (1979)

¹⁰ The following material on alcohol is from a working paper by Ruth Dupré (2004).

¹¹ By the end of the 1870s, only Maine, Vermont and New Hampshire remained there prohibitions.

¹² All states but New Jersey and Nevada had local option laws.

¹³ Article XVIII, Section 1, Constitution of the United States.

However, this prohibition never became the success the advocates had hoped for and it was to be repealed – the only amendment ever to be repealed – only 13 years after its introduction. Since then, the distribution and sale of alcoholic beverages is regulated by individual states. As a result, the extent and nature of alcohol vary by state. While each state has adopted its own unique regulatory system, several broad categories can be identified.¹⁴ A first category consists of states having statutes granting public monopoly control. A second broad category includes states regulations that ban advertising of alcoholic beverages or has restrictions for the advertising of prices. Lastly, one of the more stringent forms of alcoholic regulations is the establishment of a minimum legal drinking age. Since 1989, all states have a uniform minimum purchase age of 21 years for all forms of alcohol.¹⁵

While alcohol always has been considered sinful from a religious perspective (both in the U.S. and in many other countries) the situation is somewhat different with tobacco. Among Native Americans tobacco was considered to possess magical and healing powers. However, since its introduction in Europe in the mid 16th century it has been subject to regulation. One of its earlier antagonists, King James I of England, wrote in 1604:

”A custom loathsome to the eye, hateful to the nose, harmful to the brain, dangerous to the lungs and in the black stinking fume thereof, resembling the horrible Stygian smoke of the pit that is bottomless.”¹⁶

Under his reign, England prohibited the use of tobacco. This prohibition was not an isolated occurrence; many other cities and countries did the same during the 17th century.¹⁷ Despite spectacular penalties for smoking¹⁸, the use of tobacco saw a steady increase in popularity during the upcoming centuries. The trend in the U.S. was no exception and in 19th century America, almost all men used tobacco in various forms.¹⁹ By the end of the 19th century, cigarettes made their American debut in the New York City and remained for some time an exotic and mostly urban

¹⁴ For a further discussion concerning these categories see Nelson (2001).

¹⁵ Nelson (2001).

¹⁶ <http://en.wikipedia.org/wiki/Tobacco>

¹⁷ See Alston, Dupré & Nonnenmacher (2000).

¹⁸ Penalties for smoking could include everything from sliced noses in Russia, beheadings elsewhere, and excommunication under Pope Urban VIII (Alston, Dupré & Nonnenmacher (2000))

¹⁹ To get a better picture of the extent of that use and the tobacco industry’s role in the American economy it can be said that until 1883, tobacco excise tax accounted for one third of internal revenue collected by the United States government (<http://en.wikipedia.org/wiki/Tobacco>)

novelty.²⁰ The status of the product changed in the 1880s when cigarettes became available to the masses. The foremost reason for this was the relative price effect resulting from the invention of the first practical cigarette-making machine²¹ and lower taxes²² which reduced the price to consumers. Figure 1 shows the dramatic rise in the per capita consumption of cigarettes from the late 19th century.

<< Insert Figure 1 >>

This trend scared reform and religious groups²³ who considered cigarette smoking (as with alcohol) evil for the individual and disruptive for society.²⁴ Just like with alcohol, these groups tried to make the authorities to end the use of cigarettes by regulation. Despite tough resistance from the well organized tobacco lobby U.S. cities and states passed acts to prohibit the sale, manufacture and use of cigarettes in the late 1890s. These laws took a number of different expressions. Some states merely prohibited the sale of cigarettes, while others included an outright prohibition. However, studies showed that the tobacco laws were often violated since local officials would not enforce a law in the face of a popular demand.²⁵ The turning point in the legislative war against tobacco came when the tobacco companies succeeded in having their product included in military rations²⁶ during the World War I, where under the stress of warfare many soldiers became habitual smokers.²⁷ After the war, soldiers brought their newfound habit back home making it common and more respectable resulting in a complete abortion of all tobacco laws except those concerning minders.²⁸ During the Roaring Twenties, smoking was portrayed as something glamorous and became socially acceptable for women as well.²⁹ That image more or less remained until 1952 when Reader's Digest published the much well known article "Cancer by the Cartoon", an article revealing the dangers of smoking. The effect of the article was colossal and the following year, cigarette sales declined for the first time

²⁰ *See id.*

²¹ *See id.*

²² Alston, Dupré & Nonnenmacher (2000).

²³ The WCTU (Woman's Christian Temperance Movement) and its splinter organizations were the main forces behind the initial cigarette prohibition movement in the U.S. (Tate (1999)).

²⁴ *See id.*

²⁵ *See id.*, p. 61 (1999).

²⁶ During the war the government together with various volunteer corps supplied 425 million cigarettes a month to soldiers fighting in France (Tate, pp. 75-82 (1999)).

²⁷ <http://en.wikipedia.org/wiki/Tobacco>

²⁸ Alston, Dupré & Nonnenmacher (2000).

²⁹ <http://en.wikipedia.org/wiki/Tobacco>

in a couple of centuries.³⁰ The tobacco industry realized the danger and responded swiftly with a massive marketing campaign of cigarettes that promised a “healthier” smoke and studies of their own.³¹ This held off the public for another decade but it all came to an end in the early 1960s, when the Surgeon General’s Committee on Smoking and Health, convened in response to political pressures and a growing body of scientific evidence, concluded that cigarette smokers suffers a much higher risk to get lung cancer than the average non smoker.³² The tobacco industry has been on the run ever since. Since the introduction of the Federal Cigarette Labelling and Advertising Act in 1965 all packaging and advertisements must display a health warning from the Surgeon General.³³ In 1971 all tobacco related commercials were banned from being broadcasted and in 1994, Mississippi filed the first state lawsuit seeking to get back millions of dollars from tobacco companies for smokers’ Medical bills.³⁴

Like with alcohol, religious authorities generally scowl on gambling to some extent and because of various perceived social costs³⁵, most legal jurisdictions censure gambling to some degree. The United States has a complex history of regulating gambling activities. In the 18th and 19th centuries, gambling was a widespread activity including everything from card games, to racetracks, to particularly lotteries. Before the emergence of the banking industry lotteries were a popular way of raising money and therefore served an important public purpose. Unfortunately, private lottery companies strayed from pure public purposes in the 19th century, and some lotteries were found to be fraudulent.³⁶ This in combination with immorality arguments³⁷ against gambling resulted in a nationwide prohibition against gambling in 1894, although illegal gambling continued. All forms of gambling remained illegal in the U.S. until 1931. It was the state of Nevada that ended this prohibition in an attempt to revitalize its economy in the aftermath of the stock market crash of 1929. Therefore Nevada legalized casino gambling in 1931. For many decades Nevada would stand

³⁰ <http://edition.cnn.com/US/9705/tobacco/history/>

³¹ This was one of the actions that eventually resulted in one of the largest spate of public antitrust litigation against the tobacco industry with the forty-six state Attorney General complaints against the major cigarette companies in the 1990s, leading to the Master Settlement Agreement (MSA) in November of 1998. The states sought reimbursement for health care expenditures resulting from a historical tobacco industry conspiracy to suppress the truth about smoking harms. For a more thorough discussion about how the big tobacco companies suppressed development of a “safer cigarette” and research into the health hazards of smoking, and the MSA see Crane (2005).

³² <http://edition.cnn.com/US/9705/tobacco/history/>

³³ <http://en.wikipedia.org/wiki/Tobacco>

³⁴ <http://edition.cnn.com/US/9705/tobacco/history/>

³⁵ Gambling has been blamed for social problems ranging from personal tragedies, such as addiction, divorce, bankruptcy and domestic abuse, to public ills such as crime and welfare burdens (Hurt (2005)).

³⁶ *See id.*

³⁷ Arguments against gambling focused on the immorality of either trying to obtain something of value without contributing any work or worshipping luck and therefore straying from monotheistic Judeo-Christian teachings

alone as the one state in which casino gambling was legal. However, Americans predilection for gambling made the prohibition fragile and in 1976, the U.S. Commission on the Review of the National Policy toward Gambling³⁸ concluded:

”Gambling is inevitable. No matter what is said or done by advocates or opponents in all its various forms, it is an activity that is practiced, or tacitly endorsed, by a substantial majority of Americans”³⁹

In sync with the report, the modern movement to legalize casinos began with New Jersey legalizing casino gambling in Atlantic City. Legislators in other states tried to duplicate the same legislation, but many were unsuccessful.⁴⁰ It was not until recently, beginning in the mid-to-late nineties, the deregulation of casino gaming became a trend across the United States as a number of states, due to both political referendums and budget concerns, allowed commercial gaming. At the same time that states were legalizing casino gambling, and the federal government was allowing tribal casino gambling, states were also reintroducing lotteries and other forms of gambling.⁴¹ Sports betting are the one form of gambling that has not seen an expansion in legalization. Yet today, sports betting are legal in only four states with Nevada having the only dynamic legal sports betting industry. This however does not stop the gaming loving Americans from placing bets and NGISC (National Gambling Impact Study Commission) estimated that illegal sports betting in the U.S. could be a \$380 billion industry.⁴² At present, despite the regulatory stagnation of legalized sports betting and the prohibition of Internet gambling, the United States has more forms of legalized gambling

³⁸ Final Report, Commission on the Review of the National Policy Toward Gambling, p.1 (Washington: 1976) cited at www.vicfund.com

³⁹ Hurt (2005) somewhat explains the Americans penchant to gambling through claiming that risk taking is a distinctively social value. Further she claims that Americans have been thought to realize “nothing ventured, nothing gained” and that this embracing of risk prompts individuals in the United States to participate in gambling activities.

⁴⁰ Between 1978-88, sixteen out of seventeen state campaigns to legalize gambling failed, some repeatedly (Mason & Nelson stated in Hurt (2005))

⁴¹ Despite the last decade’s progressive efforts to legalize casinos and other types of gambling activities the federal government has been very inhospitable to online gambling maintaining its prohibition for Internet gambling. NGISC (National Gambling Impact Study Commission) recommended in its report (<http://www.ncfamily.org/NGISC%20Final%20Report/5.pdf>) the federal government to respond to the threat of online gambling by (1) explicitly prohibiting all online gambling without exceptions; (2) targeting for prosecution internet service providers, wireless device manufacturers, credit card providers, money transfer services, and other aiders and abettors; (3) prohibiting transfers of monetary funds to these sites; (4) prohibiting states from allowing online gambling; and (5) encouraging foreign countries to forbid such sites. The flourishing of Internet gambling has been aided in the fact that the U.S. stance against Internet gambling is not a global one. Currently approximately 1800-2000 gambling websites are in existence, and they generated about \$7.4 billion in revenue in 2004. U.S. residents constitute 60-70 percent of the online gamblers (Hurt (2005)).

⁴² NGISC Report, <http://www.ncfamily.org/NGISC%20Final%20Report> (describing sports betting as the most widespread and popular form of gambling)

than in any time in over 100 years. Hence, one could believe that gaming would be more socially acceptable today than it has been over the last century but this is not the case. Many surveys of individuals across the country indicate that public opinion still regards gambling as sinful and unsuitable.⁴³

Unlike the previous three categories of sin stocks, also known as the triumvirate of sin (alcohol, tobacco and gambling), it is not clear that the guns-defence industry is considered a sin by many Americans. Homeland Security and anti-terrorism fighting justifies the defence industry according to those who do not consider weapons as sinful. Further, the tradition of owning ones own gun goes back to the very foundation of the country and is still today considered by many Americans as a natural human right.⁴⁴ However, so called “Socially Responsible Investors” would claim that you should not own stocks that have anything to do with defence or weapons. Besides underlining the terrible suffering weapons causes in war they point to the fact that guns have become a major source of injury in the American society. In 1993, 39,500 people were killed with guns and another 125,000 suffered injuries.⁴⁵ In 1994 social scientists estimated that there were 235 million privately owned firearms that are approximately nine guns for every ten Americans.⁴⁶ Unlike most other consumer items guns are commonly employed in violent crimes. In 1993, guns were used in the commission of over one million murders, assaults, robberies, and rapes, about ten percent of all such crimes.⁴⁷ This illustrate that gun violence is a serious problem in the United States. However, it is not until quite recently, following a highly publicized massacre at a suburban high school in Littleton, Colorado in the spring of 1999, carried out by two students armed with guns, proposals for greater regulation of gun sales moved to the top of the national political agenda.⁴⁸ Also in the aftermath of the Littleton massacre, many state legislatures abandoned pending legislation designed to reduce gun regulation.⁴⁹

⁴³ Hong & Kacperczyk (2005)

⁴⁴ According to a study by Alice Hanson Jones (1978) 54 percent of the male population had at least one gun already in 1774 (Alice Hanson Jones (1978) quoted in Lindgren & Heather (2001))

⁴⁵ Of these gun fatalities, 48 percent were suicides, 47 percent homicide, 4 percent accidents, and 1 percent within the legal justice system (Kleck (1997) supra note 2, at 1, quoted in Lytton (2000))

⁴⁶ Lytton (2000)

⁴⁷ *See id.*

⁴⁸ *See id.*

⁴⁹ Brooke, J. Shootings Firm Up Gun Control Cause, At least for Present, N.Y. Times, April 23, 1999.

(ii) Profile of Sin Stocks

Fama and French (1997) has classified stocks into 48 different industries according to SIC codes. Later they have modified this classification and added Computer Software as an industry group. The old industry group Computers has become Computer Hardware. This revised classification scheme will be used as starting point for this investigation. In the 49 industry group scheme, stocks in industry group 4 (beer or alcohol), industry group 5 (smoke or tobacco), and industry group 26 (guns or defence) are considered sinful stocks.⁵⁰ Stocks with SIC codes 2100-2199 are in the tobacco related group, those with SIC codes of 2080-2085 are in the alcohol group, and those with SIC codes 3760-3769, 3795, and 3480-3489 are in the weapon related group. Despite their thorough classification of stocks they do not separate gaming stocks from hotel stocks or other entertainment stocks. Therefore, the gaming industry group is left to be created. To create this group I need to use the NAICS classification⁵¹ which explicitly labels stocks as gaming. Stocks included in the gambling industry group are those with NAICS codes of 7132, 71312, 713210, 71329, 713290, 72112, and 721120. Next I weight the stocks in the gambling portfolio equally to match the material collected from Kenneth French's homepage. In sum, sin stocks are the union of the Fama and French (1997, revised classification) industry groups 4, 5 and 26 along with the NAICS group for gaming. Hence, this investigation will work with an expanded 50-industry group scheme.

I do not restrict my sample to companies that have the aforementioned SIC and NAICS codes as their primary business code, I also include stocks with business segment codes as defined above. From Thomson One Banker I download the Compustat Segments Data for my sample period stretching from 1985 to 2004.⁵² That means that my final list of stocks is the union of two screening procedures – one from the Fama and French (1997) and NAICS classifications and the other from Compustat Segments Data. The latter screen on company segment information helps me get a more accurate list of sin stocks since many companies such as Altria (formerly known as Phillip Morris) and Hilton Hotels have diversified businesses. A list of sin stocks can be found in the appendix in the back of this paper. There are many well-known names on this list such as Altria,

⁵⁰ Vice Fund (www.vicfund.com), the first open-end fund that focuses on “socially irresponsible” investments, also classifies stocks related to the aerospace industry as sin stocks. I, however, can not find a feasible explanation for doing so and therefore choose not to include aerospace in my sample.

⁵¹ NAICS (North American Industry Classification System) is the successor for the SIC system and divides producing and non-producing economic activities into 20 sectors and 1,770 industries in its U.S. version. The system was developed to supply Canada, Mexico and the United States with a homogenous industry classification scheme. The aim with this new system is to simplify the economical analysis between the three countries (See www.bts.gov/publications/pocket_guide_to_transportation/2005/html/glossary.html)

⁵² The reason for beginning my sample period in 1985 is that segment data is not available before that date.

Anheuser Busch Co., Boeing, Harrahs Entertainment, Hilton Hotels, Molson Coors Brewing Co., Reynolds American, and Smith & Wesson. In Table 1 panel A, I present a more systematic year-by-year look at the number of sin stocks beginning in 1985 and ending in 2004. The list includes 148 different companies, 40 of those are alcohol companies, 15 tobacco companies, 27 defence companies, and 66 gaming companies. This number is diminishingly small relative to the thousands of stocks in the market portfolio indicating that the cost of being unable to diversify into publicly traded sin companies are small from a portfolio theory perspective. We can see that the number of stocks have increased substantially in all sin categories during the last 20 years. The increase in the number of gaming stocks is the most significant, especially during the nineties with the ongoing deregulation of the gambling industry.⁵³ This trend might suggest that gambling is considered less sinful than before.

<< Insert Table 1 panel A >>

To give the reader a better feel for these sin stocks, Panel B of Table 1 describes the data I use in my subsequent analysis. All calculations are made using data from Fama and French (1997-revised) industry portfolios (the original 49 Fama and French (1997-revised) industries plus gaming).⁵⁴ Mean returns, standard deviations, Sharpe ratios and betas are on a monthly basis. Based on returns and Sharpe ratios it seems sin stocks out-perform most other industries. The market betas for the four relevant portfolios (beer, smoke, guns, and gambling) are 0.64, 0.74, 0.79, and 0.89 respectively.⁵⁵ Apparently beer, smoke, and guns have betas within the lower range of the market, comparable to groups like oil, food, and insurance. All of them known to be non-cyclical industries. Gambling stocks on the other hand have betas comparable to those of many other industries. If we look at some other basic features of sin stocks we can see that the companies in the beer and smoke industries are much bigger than most other industry groups. This might be an expression for the

⁵³ The reader is exhorted to consider these numbers with some scepticism. Even though they might be truthful in trend and the number of sin stocks most likely is correct during the latter half of the sample period, the number of sin stocks is probably underestimated during the first half of the sample period. This is due to shortcomings in the data set available to the author. Potential implications this might cause will be discussed under section VII.

⁵⁴ Note that when calculating these statistics, I have not excluded the gambling stocks from the Fama and French portfolios. However, I do not expect this to bias the calculations of industry characteristics since the number of gaming stocks are diminishingly small in the wide universe of securities.

⁵⁵ These are the equal weighted portfolios. Equal weighted portfolios will be used throughout this paper unless anything else is stated.

complex background and the tight regulation associated with these industries which creates hazards for new entrants.⁵⁶

<< Insert Table 1 panel B >>

Up until this point most readers are probably missing one industry in my selection of sinful industries; the sex industry. Even though many consider the sex industry to be among the most sinful I will not include this industry in my sample. The reason is very simple; there are very few publicly traded companies with significant operations in sex.⁵⁷ Therefore I lack the material to create a separate group for that industry and excluding those companies will not affect my results.

III. DATA

With the list of sin stocks in hand, the next step is to obtain the relevant data. To study the performance and style of sin stocks I construct a database containing stocks identified as sin stocks. Using Compustat data I construct portfolios of stocks based on the unethical screening procedure described under section 2. The data used from Compustat is supplied by Thomson One Banker which supplies selected data from information sources like Compustat, Datastream, and Worldscope. Since the American stock markets during the last decades have been driven by a limited number of sectors such as the pharmaceutical, computer related, and telecom sectors I think it is important to not only compare sin stocks to the market as a whole, but also to its related industries. Thereby I hope to get the results necessary to either reject or not reject my hypothesis. Based on a 1-digit SIC code screening I identify reference industries with related businesses. Included in my reference group are Fama and French (1997-revised) industry groups 2 (food), 3 (soda), 7 (fun), 21 (machinery), 22 (electrical equipment) and 44 (meals and hotels).⁵⁸

Through the information available at Thomson One Banker I then collected return data for my selection of sin stocks. End of month prices were used for calculating monthly returns. Monthly returns span over a 20-year period, from January 1985 to December 2004. However, the sample

⁵⁶ E.g. see Bulow & Klempere (1998) and Crane (2005) for the tobacco industry and Dupré (2004) for the alcohol industry.

⁵⁷ I have only been able to identify two major companies in this category; Playboy Entertainment and Private Media Group. However, there are a number of companies within the entertainment sector that profit off sex through possessions in various subsidiaries. Those companies are however difficult to trace.

⁵⁸ Food is included as comparable industry to the tobacco industry, soda is included as comparable industry to the alcoholic beverage industry, fun and meals & hotels are included as comparable industries to the gambling industry, and finally machinery and electrical equipment are included as comparable industries to the defence industry.

period for any given asset is typically a shorter subset of that overall period. All returns are free from brokerage fees, inclusive of dividends and in U.S. dollars. To be included in my sample, a firm must have the requisite financial data at Thomson One Banker. As stated above this leads to a total sample of 148 sin stocks with monthly returns available sometime during the period ranging from January 1985 through December 2004. For my econometric analysis I would ideally like to have access to data supplying monthly shares outstanding in order to create value-weighted portfolios of sin stocks.⁵⁹ Unfortunately I do not have such data and therefore I will use equal weighted portfolios.

Brown, Goetzmann, Ibbotson and Ross (1992) points out that leaving out dead funds leads to an overestimation of average performance. It is possible that the same scenario is applicable to stocks. In an attempt to avoid a possible survivorship bias I add back stocks that were de-listed at any point during the sample period. Dead stocks were included in the sample until they disappeared, after which the portfolios are adjusted accordingly. In an attempt to give the reader a better understanding of the influence of this I compared the mean returns of all stocks (de-listed plus listed) with the return on listed stocks only. In contrast to my expectations I found that restricting my sample to listed stocks only lead me to underestimate average returns for the sin stocks by approximately 5 basis points a month or just below 80 basis points a year.⁶⁰

(i) Variables for Time-Series Regressions

Tobacco_t is the monthly return, net of the risk-free rate⁶¹, for an equal weighted portfolio of tobacco related stocks. Alcohol_t is the monthly return, net of the risk-free rate, for an equal weighted portfolio of alcohol related stocks. Defence_t is the monthly return, net of the risk-free rate, for an equal weighted portfolio of weapon related stocks. Gambling_t is the monthly return, net of the risk-free rate, for an equal weighted portfolio of gaming related stocks. SINP_t is the monthly return, net of the risk-free rate, for an equal weighted portfolio of sin stocks. COMP_t is the monthly return, net of the risk-free rate, for an equal weighted portfolio of stocks considered to be comparable to sin stocks: these are stocks from the Fama and French (1997-revised) industry groups 2 (food), 3 (soda),

⁵⁹ In an equal weighted index all firms are given the same weight. This might give an overestimation of the average monthly return (see e.g. Banz (1981) for a discussion for the small firm effect; large firms have in general lower returns than small firms). Therefore a value-weighted index is often considered more accurate. Whether this indeed is the case or not will be discussed in Section VII

⁶⁰ One possible explanation for this finding is that a majority of the stocks being de-listed during the sample period have been so successful that they have been acquired by other companies. However, there might be many reasons for this pattern and finding a feasible explanation for it lies beyond the scope of this paper.

⁶¹ The risk-free rate is the 1 month T-bill from Ibbotson Associate (available from Kenneth French's web-site).

7 (fun), 21 (machinery), 22 (electrical equipment) and 44 (meals and hotels).⁶² $TRIUMP_t$ is the monthly return, net of the risk-free rate, for an equal weighted portfolio of sin stocks exclusive of the defence industry group. $TRIUMCOMP_t$ is the monthly return, net of the risk-free rate, for an equal weighted portfolio of stocks considered to be comparable to the triumvirate of sin: these are stocks from the Fama and French (1997-revised) industry groups 2 (food), 3 (soda), 7 (fun), and 44 (meals and hotels). MKT_t represents the return on the market proxy (the equal weighted CRSP index⁶³ inclusive of dividends) in excess of the risk-free rate. SMB_t denotes the difference in return between a small cap portfolio and a large cap portfolio, HML_t denotes the return spread between a value portfolio and a growth portfolio and MOM_t is the return difference between a prior 12-month winner portfolio and a prior 12-month loser portfolio. Data for MKT_t , SMB_t , HML_t , and MOM_t were obtained from the information available from Kenneth French's web-site.⁶⁴ The various portfolios' summary statistics are presented in Panel C of Table 1.

<< Insert Table 1 panel C >>

IV. METHODOLOGY

In this paper I will employ a relatively conservative methodology to estimate sin stock performance. I will purely consider the time-series of the returns of sin stock portfolios and see how it fares after adjusting for different distinguished predictors of stock returns such as the market portfolio.

(i) CAPM-model

In order to investigate the performance of sin stocks, an economic model has to be build followed by an econometric model that forms the basis for a quantitative economic analysis. The scarce literature previously written on sin stocks performance provides few suggestions on how to create the economic model. However, the economic literature provides numerous examples on how to evaluate stock performance. One of the most frequently used performance models is the Capital

⁶² Food is included as comparable industry to the tobacco industry, soda is included as comparable industry to the alcoholic beverage industry, fun and meals & hotels are included as comparable industries to the gambling industry, and finally machinery and electrical equipment are included as comparable industries to the defence industry.

⁶³ CRSP (Centre for Research in Security Prices) includes all stocks listed on one of the three big American exchanges – AMEX, NASDAQ, and NYSE.

⁶⁴ mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

Asset Pricing Model (CAPM). The attraction of this model is that it offers powerful and intuitively pleasing predictions about how to measure risk and the relation between expected return and risk. According to CAPM the expected excess return (expected return minus the risk free rate) on an asset i is given by:

$$E[R_i] - R_f = \beta_i^M (E[R_m] - R_f) \quad (1)$$

where R_i is the return on asset i , R_f is the risk-free rate, $(E[R_m] - R_f)$ is the expected excess return on the world market portfolio and beyond the risk-free rate (often called the equity risk premium), $\beta_i^M = \frac{Cov(R_i, R_M)}{\sigma_M^2}$ is the systematic risk of asset i relative to the world market portfolio (beta), σ_M^2 is the variance of the world market portfolio. The economic model in equation (1) constitutes the foundation upon which I will build the analysis in this paper. To allow for a difference between observable total return and the expected value of total return I add a random error term, $\varepsilon = R - E(R)$. This random error term embodies all the factors that cause the return to differ from its expected value. Denoting the t 'th monthly observation by the subscript t gives me:

$$E[R_{it}] - R_{ft} = \beta_i^M (E[R_{Mt}] - R_{ft}) + \varepsilon_{it} \quad t = 1, \dots, t_0. \quad (2)$$

The introduction of the error term, and the assumptions about its probability distribution, turn the economic model into the econometric model in (2).⁶⁵ The introduction of the error component is necessary to cope with the intrinsic uncertainty in economic activity. The random term represents a “noise” component, which obscures our understanding of the relationship among variables. However, even though the economic model has been transformed into an econometric model it is not yet possible to run a time-series regression. The world market portfolio – which consists of all the assets in the world and include not just financial assets but also consumer durables, real estate, and human capital⁶⁶ – is not observable so it is necessary to use a substitute. It is therefore common to use an estimate for β_i^M typically obtained by running the following time-series regression:

⁶⁵ This procedure in transforming an economic model into an econometric model will be followed throughout this paper.

⁶⁶ Fama & French (2004)

$$R_{it} - R_{ft} = \alpha_i + \beta_i^I (R_{It} - R_{ft}) + \varepsilon_{it} \quad t = 1, \dots, t_0. \quad (3)$$

where

R_{it}	=	the return (at time t) on portfolio i
R_{ft}	=	the return on a one month T-bill in month t .
R_{It}	=	the return on index I used as a proxy for the world market portfolio in month t
ε_{it}	=	an <i>iid</i> error term with zero mean

The model's β_i^I (beta) is interpreted as measuring an asset's or portfolio's market risk exposure and the intercept, α_i , gives the Jensen's alpha, which is usually interpreted as a measure of out- or under-performance relative to the used market proxy.⁶⁷ Hence, in this scenario it is implicitly assumed that the difference between the return on an asset and the return on the single-factor benchmark according to an estimated CAPM provides an accurate estimate of risk-adjusted performance.

(ii) Multifactor models

In spite of the widespread use of the single-factor performance model, its true predictive power is questionable. Academic research⁶⁸ has found that when realized returns are compared to what the CAPM would have expected, the model is often incorrect.⁶⁹ Many researchers blame CAPM's shortcomings in elucidating the variations in observed returns on the fact that it uses only one risk factor to explain expected returns. Considering the myriad of risk factors facing companies today, and given that the CAPM uses a single factor to describe aggregate risk, it seems logical that a model including more sub-factors might provide a more descriptive and predictive model. By decomposing the single factor model along multiple dimensions it is possible to more specifically identify the risk factors to which a company is exposed.

Moreover, adding supplementary independent variables to a regression often has the statistical benefit of improving the explanatory power of a model. Therefore, multifactor models

⁶⁷ See Jensen (1968)

⁶⁸ For a thorough discussion of the academic research see Fama & French (2004)

⁶⁹ Bartholdy and Peare (2002) present evidence indicating that beta, on average, explains as little as 3% on excess returns.

relax the assumption and constraint of a single risk factor and consider other factors that affect expected returns to assets.⁷⁰

(a) Fama and French 3-factor Model

The 3-factor model suggested by Fama and French⁷¹ provides an alternative to CAPM for expected return estimation. In their extensive research they have found factors describing value and size to be the most significant factors, outside of market risk, for explaining excess return. In their research Fama and French have found that investors have historically received a premium for investing in stocks of companies with relatively small market capitalization. Therefore, in their model they represent this size premium by the SMB factor which stands for Small Minus Big. In practice, the SMB factor is calculated as the average return for the smallest 30% of stocks in time period t , minus the biggest 30% of stocks in the same time period. If the results of these calculations are positive, the small cap stocks outperformed the large cap stocks in that time period. If the sum takes a negative value, the large cap stocks have outperformed the small cap stocks.

Furthermore, they have also found a connection between a company's book-to-market characteristics and its stock's performance. Their results suggest that typical "value" stocks (high B/M) have a higher risk exposure versus growth stocks (low B/M). This identified value premium, denoted HML which is short for High Minus Low, is calculated in a similar fashion to that of the SMB. The HML factor is calculated as the average return for the 50% of stocks with the highest Book-to-Market (B/M) ratio minus the average return of the 50% of stocks with the lowest B/M ratio for each time period t . A positive HML in a time period indicates that value stocks outperformed growth stocks and a negative result indicates the opposite.

The result of combining the original market risk factor with the SMB and HML factors is the renowned Fama-French 3-factor model:

$$E[r_{it}] - r_{ft} = \beta_i^M (E[r_{Mt}] - r_{ft}) + \beta_{is} E(SMB_t) + \beta_{ih} E(HML_t) \quad t = 1, \dots, t_0. \quad (4)$$

which gives the following time-series regression:

⁷⁰ See Haugen (2001), pp.145-163, and Hill, Griffiths & Judge (2001), pp.145-159.

⁷¹ See Fama & French (1993)

$$R_{it} - R_{ft} = \alpha_i + \beta_i^l MKT_t + \beta_{is} SMB_t + \beta_{ih} HML_t + \varepsilon_{it} \quad t = 1, \dots, t_0. \quad (5)$$

where, as previously described

SMB_t = the return difference between a small cap portfolio and a large cap portfolio in time period t ,
 HML_t = the return difference between a value (high B/M) portfolio and a growth (low B/M) portfolio in month t

Akin to CAPM the betas are slopes in the multiple regression of $R_{it} - R_{ft}$ on MKT or $(R_{it} - R_{ft})$, SMB_t and HML_t . These slopes are illustrating the exposure an asset has to market risk, size risk, and value risk. The market risk beta in this scenario will however have a different value from the beta in a CAPM model as a result of the newly developed factors.

(b) Carhart 4-factor Model

While the benefits of the 3-factor model are nowadays acknowledged, it is not able to explain the cross-sectional return in momentum-sorted portfolio returns. Therefore, Carhart (1997) extended the Fama-French model by adding a momentum factor to the existing model to capture persistence in portfolio performance.

In practice, the MOM factor is calculated as the average of the returns on two (big and small) high prior return portfolios minus the average of the returns of two low prior return portfolios. Big is synonymous to a firm with a market cap above the median for the investigated index while small firms are below the median index market cap. Firms in the low prior return portfolio are among the worst performing 30 % and those in the high portfolio are among the best performing 30%. The result of adding the newly developed factor is the 4-factor Carhart model

$$E[r_{it}] - r_{ft} = \beta_i^M (E[r_{Mt}] - r_{ft}) + \beta_{is} E(SMB_t) + \beta_{ih} E(HML_t) + \beta_{im} E(MOM_t) \quad t = 1, \dots, t_0. \quad (6)$$

which gives the following time-series regression:

$$R_{it} - R_{ft} = \alpha_i + \beta_i^l MKT + \beta_{is} SMB_t + \beta_{ih} HML_t + \beta_{im} MOM_t + \varepsilon_{it} \quad t = 1, \dots, t_0. \quad (7)$$

where

MOM_t = the return difference between a portfolio of past 12-month winners and a portfolio of past 12-month losers in month t

The coefficients in equation (7) have the same interpretation as in equation (5). However, since an extra coefficient has been added, illustrating the exposure an asset has to trends in returns, the betas in this scenario will have different values from the betas in equation (5). In using three additional control variables, I hope to mitigate potentially severe biases resulting from the presence of style tilts in stock portfolios (e.g. size, value versus growth or momentum effects).

V. EMPIRICAL RESULTS

In this section I discuss the results of applying the econometric models presented in Section IV on my database. First, I will present the results of applying equations (3), (5), and (7) on my database. I perform these calculations on the individual sin portfolios, for a portfolio including all sin stocks, and a portfolio constituted by the triumvirate of sin. Since the primary focus of this paper is the performance differential between sin stocks and other stocks I also investigate the returns on a *difference* portfolio⁷² constructed through subtracting a portfolio of comparable stock returns from the returns of the sin stock portfolio, and another through subtracting a portfolio of comparable stock returns from the returns of the triumvirate of sin portfolio. The portfolios of comparables are constructed according to the description in Section III. These portfolios are then used to examine differences in risk and return between a sinful and not-sinful investment style. Table 2 presents the result of applying the factor models on my database of selected sin categories.

<< Insert Table 2 >>

From this table several conclusions can be drawn. First, it is clear that all four sin categories outperform the market (consider the alphas). The best performing industry is the gambling industry

⁷² This procedure follows the method used by Bauer, Koedijk & Otten (2002)

which outperforms the market by 133 basis points (1.33 percent) per month when investors adhere rather strongly to a belief in the CAPM. This finding is strengthened by high statistical significance. When the investor's beliefs shift toward multifactor models like the Fama-French (1993) three-factor model or the Carhart (1997) four-factor extension, then the rewards associated with the gambling industry are lower – 87 basis points per month respectively 102 basis points per month. These findings are statistically significant on the 5 percent level. The gambling industry's higher return estimate under the 4-factor model than under the 3-factor model is explained by its negative loading on the momentum factor. The alcoholic beverage industry under-perform relative to the other sin categories. The industry's returns are considerably lower compared to the other sin industries no matter whether an investor's beliefs tilt towards the single- or multifactor framework. Furthermore, a comparison of the betas reveals that the industry portfolios differ distinctively in exposure to the market factor. The only exception is the gambling industry with a beta comparable to those of many other industries. Further, it seems all sin industries but the gambling industry load negatively on the SMB factor, meaning large cap stocks outperform small cap stocks. This statistically significant pattern might be an indication that the tight regulation associated with sin stocks makes life harsh for small companies and hinders new entrants.⁷³ Finally, the loadings on the HML factor indicate that sin stocks behave like value stocks. Whilst the alcohol, defence, and tobacco industries are very similar in their characteristics, the gambling industry tends to have a somewhat diverging pattern. One possible explanation might be that the gambling industry is not as mature as the other industries in my sample and might therefore have characteristics more in line with other growth industries. However, when comparing my gambling portfolio to a portfolio of other growth industries (Fama and French (1997-revised) industry groups 36 (Software) and 37 (Chips)) I find the characteristics of the gambling portfolio to be more in line with the sin industries than with other growth industries. Among other things, the two portfolios (i.e. the gambling and the growth portfolio) load very differently on the HML factor.

To get a better feel for sin stocks as a group Table 3 panel A reports performance estimates resulting from estimations of the combined sin portfolio. Compared to the results presented in Table 2, this table displays some new insights. First, the adjusted R-squared from the models have increased as compared to the adjusted R-squared values reported in the previous table. However, we can see that the incremental explanatory power of the factor framework is substantially lower for the sin portfolio than for its comparables. This indicates that there are more factors driving sin stock

⁷³ To investigate whether this is the case or not is, however, beyond the scope of this paper

performance than the ones that normally has the highest explanatory power on stock performance. Second, notice that the sin portfolio earned a large average factor-adjusted return equal to 6.84 percent per annum, whereas the comparables portfolio performed poorly. The high statistical significance obtained for all factor loadings but the momentum factor are encouraging. Further, notice that the sin portfolio and its comparables behave similarly. For both portfolios I observe a negative coefficient on SMB, which implies a bias towards large capitalization stocks. Factor loadings on the HML factor indicates that both sin stocks and their comparables behave like value stocks. In both cases, I also observe a negative loading on MOM, suggesting that neither sin stocks, nor their comparables are active in cyclical businesses. However, this final observation is not statistically significant in either case.

However, the comparables portfolio's loading on SMB is smaller than that of the sin portfolio and the alpha is considerably smaller in all of the specifications. For the one-factor model, the alpha for the comparables has a negative coefficient of -14 basis points per month. After adjusting for a multivariate framework consistent with the 4-factor extension suggested by Carhart (1997), the alpha for the comparables is as low as -37 basis points per month indicating a very poor performance. Therefore, these results suggest that my sin portfolio's performance behaviour is different than that of the comparables.

<< Insert Table 3 panel A >>

To make this point more clear and enhance comparability, I consider a *difference* portfolio that longs my sin stocks and shorts my comparables. This portfolio is then used to examine differences in risk and return between sinful and non-sinful investing. Results with regard to the *difference* portfolio show that the performance differential between the two portfolios equals 11.70 percent per annum after adjusting for multiple factor loadings. The fact that this difference is highly significant underlines the huge performance difference between sin stocks and their comparables over the sample period. As for the factor loadings, the *difference* portfolio results confirm significant differences in MKT and SMB but also underline similarities in HML and MOM characteristics. By looking at the MKT and SMB factor we can conclude that the sin industries returns are more stable and to a higher extent driven by large companies than their comparables returns, independent of whether an investor's beliefs adhere to the CAPM framework or tilt toward a multifactor framework.

Since it is not clear that defence is considered a sin by many Americans I have decided to conduct the same investigation as above but this time I will narrow my definition of sin stocks by excluding the defence industry, resulting in what is known as the triumvirate of sin. The result of running the previous test on a portfolio made out of stocks included in the triumvirate of sin is presented in Table 3 panel B.

<< Insert Table 3 panel B >>

With a few exceptions this table reveals the same patterns as is shown in Table 3 panel A. First, the adjusted R-squared from the models has decreased as compared to the adjusted R-squared values reported in the previous table. This underlines the previous statement that there are other factors, besides the ones used in this factor framework that plays an important role in explaining sin stock returns.⁷⁴ Second, when considering the *difference* portfolio all factor loadings in the multivariate framework have turned negative implying that even the HML factor has turned negative. As a result, the alpha for the *difference* portfolio increases to 110 basis points per month. Third, only with respect to the SMB factor and the MKT factor in the Carhart (1997) extension, the *difference* portfolio does exhibit a significant market exposure in the multifactor framework.

Ultimately, the benefit of regression with the 3- and 4-factor models is two-fold when compared to the less complex CAPM version. First, as the results in Tables 2 and 3 indicate, the multifactor models explains more of the variation observed in realized returns, displaying higher R² values. Second, the multifactor models often reveals the fact that a positive alpha observed in a CAPM regression is simply a result of exposure to either SMB, HML or MOM factors, rather than actual investor performance. Unfortunately, my results reveal that these well-known factors lack the ability to explain sin stock returns to the same extent they manage to explain the returns of their comparables. One factor that might increase the explanatory power of my model is a dividend factor. Sin stocks are renowned among practitioners to offer excellent dividends.⁷⁵ Therefore I add a dividends factor to my multifactor framework, which gives me the following time-series regression:

$$R_{it} - R_{ft} = \alpha_i + \beta_i^I MKT_t + \beta_{is} SMB_t + \beta_{ih} HML_t + \beta_{im} MOM_t + \beta_{id} D/P_t + \varepsilon_{it} \quad t = 1, \dots, t_0. \quad (8)$$

⁷⁴ Remember that some people only consider alcohol, gambling, and tobacco as sinful

⁷⁵ E.g. see Berman (2002) http://moneysense.ca/shared/print.jsp?content=20021127_154845_3424

where

D/P_t = the return of a portfolio of companies paying the top 30 percent dividends in relation to price

Table 3 panel C summarizes the results of applying equation (8) on my database. Notice that the extended model is not better able to explain either portfolio's returns. However, compared to the results in the previous tables, this table reveal a few discouraging differences. First, notice that for the two sin portfolios the statistical significance for all factor loadings but MKT decreases when adding the D/P-factor. Second, the sin portfolios insignificant loadings on D/P do not confirm the common perception that sin stocks are among the companies that pay the highest dividends. However, the positive loadings on the D/P-factor indicate that stocks of sinful companies pay high dividends and therefore the monthly returns for the sin portfolios diminishes to 6.06 respectively 6.86 percent per annum. Both reductions are statistically significant on the 5 percent level. As these results indicate, my little venture did not have a positive impact on either the explanatory power of the model or on its reliability. Therefore, I will not use the D/P-factor in the remaining parts of this paper.

<< Insert Table 3 panel C >>

In sum, my results indicate that sin stocks behave like value stocks (stocks with low price-to-book or price-to-earnings ratios), which have historically tended to outperform the market. All sin portfolios, both individual and combined portfolios, load positively on HML – some heavily. This connection is statistically significant for all sin portfolios but the portfolio representing the tobacco industry. Furthermore, I find that sin stocks have performed remarkably well over the last 20-year period. The average return on either sin stock strategy (i.e. investing in a sin portfolio or a portfolio including only stocks related to the triumvirate of sin) is economically large and statistically significant on a risk- and style-neutral basis, even after adjusting for dividends. Further, in terms of statistical significance, the premium estimate is dynamic to variations in methodology. Therefore, the results obtained confirm the notion that there are obvious benefits to sinful investing.

My results, however, poses concerns to the nature of the sin premium. Is the observed premium attributable to latent risk factors or due to mispricing? Many ostensible anomalies, such as

the size effect, the value premium, and the momentum anomaly accounted for in the methodology used in this paper, have been subject to considerable debate. Many scholars claim most return irregularities can be considered as proxies for various forms of risk.⁷⁶ Still there are others who assign the observed effects to market inefficiencies.⁷⁷ Despite these well established return premia, it appears the sin premium is difficult to explain within the well-known risk-return paradigm.⁷⁸ In accordance with the alternative explanation (compare Lakonishok et al. (1994)) my findings might indicate a market inability to price sin stocks in an efficient manner. This thesis is strengthened by recent research by Hong and Kacperczyk (2005) who finds evidence suggesting that sin stocks benefit from a neglect effect, implying the analyst and public coverage of sin stocks is more limited today than before, resulting from the increasing demand for socially responsible investing (SRI).

If in fact, as I claim, the equity of sin stocks is under-valued and investors shun them because of social norms, then I should be able to take advantage of changes in social norms to test my hypothesis. As I mentioned in Section II, there has been a substantial change in the way Americans look upon the tobacco industry. Tobacco was not considered a sin until the mid-sixties. Thus, my hypothesis suggests that there should not be differences in tobacco-related returns before the shift in social norms. Even though data limitations hinder me from using my self-constructed industry portfolios, return characteristics for the tobacco industry and its comparable (food) is easily accessible from Kennet French's web-site.⁷⁹

Table 4 presents the results of time-variations in social norms for the tobacco industry. The analysis is conducted in the same way as I did for sin stocks in Tables 2 and 3. In the upper half of the table I look at the performance of tobacco stocks, its comparables, and a *difference* portfolio between the two that is long tobacco stocks and short food stocks. The investigated time period in the upper half of the table is the period of 1927-1964 – a period in which tobacco was not considered sinful. In the bottom half of the table I perform the same investigation but this time during the period of 1965-2004 – a period in which tobacco was considered sinful. If in fact my hypothesis is correct and social norms have no impact on stock performance, then there should not be any differences in returns between the two periods. This, however, is not what I find. My results become most obvious when looking at the *difference* portfolios. Notice that the *difference* portfolio

⁷⁶ See Fama & French (1993)

⁷⁷ See Lakonishok et al. (1994)

⁷⁸ Meaning my results can be anomalies rather than premiums.

⁷⁹ The material used to test time-variations in social norms is the returns of Fama and French (1997-revised) industry groups 2 (food) and 5 (smoke).

during the latter period has a monthly alpha of 66 basis points, while the corresponding figure during the earlier period is 6 basis points. This difference is economically sizeable and supported by strong statistical support. This evidence suggests that social norms play an important role for the performance behaviour of tobacco stocks. Unfortunately, it is not possible to perform similar test for the three other sin industries but the strong evidence presented in Table 4 is a good indication that social norms is a driving factor behind sin stocks performance.

<< Insert Table 4 >>

Finally I will test the relative importance of litigation risk in determining the expected returns of sin stocks. One way of testing this is to focus on whether the tobacco industry's excess returns from Table 2 are driven by litigation risk. Yet today, there is no doubt that tobacco stocks face such risk but it is unclear if this risk is driving the excess returns of tobacco stocks. To find out if litigation risk is indeed a driving factor behind the performance of tobacco stocks, I divide my sample period into two sub-periods. The first period consider the performance of tobacco stocks during the period of 1985 to mid-1997, a period of relatively high litigation risk, and the second period look at the performance of tobacco stocks during the period of mid-1997 to 2004. During the latter period litigation risk dropped substantially for tobacco companies due to their monumental settlement with the state governments on June 20, 1997. In this settlement, known as the tobacco deal, tobacco companies agreed to considerable increases in cigarette tax in exchange for states ever being able to sue them again.⁸⁰ Some people refer to this settlement as the "biggest drug payoff of the century" and Martin Broughton, chairman of BAT, parent of Brown & Williamson Tobacco, described the settlement as: "They want to be paid off and we want a peaceful life."⁸¹ Most analysts agreed that tobacco companies got off easy and that their litigation risk dropped dramatically after the settlement. As a result, if the excess return of tobacco stocks is driven by litigation risk, then we should see a substantial drop in returns during the latter period. Table 5 presents the results of replicating previous regressions on two sub-periods on my database of tobacco stocks. Even though I find that the excess returns of tobacco stocks is still pretty high, there is an economically sizeable difference between the excess returns of tobacco stocks before (6.58% per annum) and after the settlement (3.47% per annum). Unfortunately, these results are not statistically significant but they

⁸⁰ See Bulow & Klemperer (1998) for a thorough discussion of this deal.

⁸¹ The Tobacco Deal: ...Or a Payoff to Purveyors of Poison? By Elizabeth M. Whelan 26 June 1997 [The Wall Street Journal](#)

are indicating that tobacco stocks in fact are driven by litigation risk. Further, notice the major change in tobacco stocks loadings on HML. This indicates that there are other reasons than litigation risk for tobacco stocks being value stocks. Further, notice that the coefficients for the SMB factor have been significantly reduced during the later period. One interpretation for this pattern is that the big tobacco companies (Phillip Morris, RJR, Brown and Williamson, Lorillard, and Liggett), which also were the companies facing the highest litigation risk, is not driving the tobacco industry the same way they previously have done. If this is the case it further strengthens my prediction that litigation risk is a major driver behind sin stocks excess returns in general and tobacco stocks excess returns in particular.

<< Insert Table 5 >>

VI. OTHER APPREHENSIONS

In this paper I have provided evidence suggesting very positive results associated with socially irresponsible investing. There are no obvious reasons for not accepting these results, however, there are a few apprehensions I would like to envisage for the reader.

First, as opposed to what is commonly recommended an equal weighted index is used and not a value weighted. The explanation to this procedure is simple; I lack data over total number of shares outstanding at the end of each month and thereby the possibility to create a value weighted index. In a previous study, Bartholdy and Peare (2002) find that the CRSP equal weighted index, including dividends – the same index as is used in this paper – has the largest average monthly return of all the indexes investigated in their sample. This might indicate that the results presented in this paper are significantly higher than they would have been if value weighted portfolios of sin stocks would have been used. Despite this finding, however, Bartholdy and Peare (2002) also find that the CRSP equal weighted index provides a better estimate for beta, and therefore expected return, based on CAPM than any of the compared indexes. Hsu (2004) give an explanation to why equal weighted portfolios in general has a higher alpha. He provides detailed mathematical proof suggesting that if prices are noisy and do not fully reflect firm fundamentals then capitalization-weighting schemes are sub-optimal equal to the square of the noise in the stock prices. Non-cap-weighted scheme constructions do not suffer from this natural negative alpha associated with cap-weighting.

Second, as Table 1 panel A reveals, the data sample used in this investigation is somewhat biased. Whilst the number of firms with SIC codes in Fama and French (1997-revised) has been relatively stable, my sample suggests something different. During the last two decades, it is only within my additional industry group gambling that there has been a major rise in the number of firms. However, according to panel A of Table 1 there has been a substantial rise in the number of firms in all sin industries. The explanation behind this bias is shortcomings in the data supplied by Thomson One Banker, at least during the first decade of my sample period. It is hard to tell whether this has an impact on the results presented but it is important that the reader is aware of this pattern.

Third, it is well established among practitioners that the alcohol, defence, and tobacco industries are relatively insensitive to fluctuations in the market. In other words, people buy cigarettes, weapons and booze regardless of economic conditions and political tensions. However, the low market beta identified for the gambling industry is a bit surprising. The gambling industry is, contrary to what this investigation suggests, known to be a volatile industry. I leave it to future research to decide whether the gambling industry has an unjustified reputation or if its low beta is a consequence of the data sample problem mentioned above. One thing is however certain, there is an ongoing and fierce discussion concerning online gambling's be or not to be in the U.S. If advocates would decide to legalize internet gaming we would probably see a dramatic increase in both the number of firms listed within the gaming sector and this sector's combined sensitivity to market fluctuations. The reasoning behind this is that the American market is the by far biggest market for online gaming and the experience from securities of online gaming companies listed on exchanges in other parts of the world are that they are very volatile.

VII. CONCLUDING REMARKS

This study provides evidence on the performance and characteristics of so called sin stocks. These are explored by elaborate multifactor models which are known to generate precise performance measures and enable the examiner to investigate asset characteristics in detail. After employing a standard CAPM single-factor model, I consider a Carhart (1997) 4-factor asset-pricing model that controls for size, book-to-market and stock price momentum.

So, to the main question this paper state, do investors who choose to create their investment portfolio out of sin stocks get rewarded for their "unethical" behaviour? According to my results the answer is yes. In this paper I provide evidence suggesting that investors who choose to fund operations that promote human vice get financially rewarded for their behaviour. How well

rewarded investors will get for investing in sin stocks depend on how big a fraction they choose to allocate to such stocks. I find that the reward for a 100 percent investment in a well diversified portfolio of sin stocks can be as big as 87 basis points per month compared to the broad CRSP-index, but only when investors adhere rather strongly to a belief in the CAPM. When the investor's beliefs shift toward multifactor models like the Fama-French (1993) three-factor model or the Carhart (1997) four-factor extension, then the rewards associated with sinful investments are considerably lower – 53 basis points per month respectively 55 basis points per month. These differences benefit from strong statistical significance. Further, I find that sin stocks come with the advantage of stability offering an excellent alternative to the investor who seeks to make his/her portfolio returns less sensitive to trends in the market.

An opponent of sinful investments might argue that a mean-variance setting leaves out the non-financial utility derived from “doing bad”, and thus my reward estimates of sinful investments overstate the net total reward to a sinful investor. This is of course correct, but as long as the elements of the mean-variance objective are in harmony with the financial risk-return goals of the investor, my results put a benchmark on the value of the non-financial utility that one should derive from sinful investing. I find that this bound can range widely, depending on the investor's view about pricing models.

My results are confusing in the sense that it is difficult to explain the observed performance differential using conventional asset pricing theory, and particularly the well-established return risk paradigm. The fact that common risk factors fail to account fully for the observed results raises the possibility of a mispricing story. However, my results suggest that social norms and litigation risk play a significant role in explaining sin stocks returns. It seems social norms have price effects as sin stocks behave like value stocks and outperform the market even after controlling for well known return predictors. Such evidence is derived from tobacco stocks which did not behave like value stocks and did not earn excess returns during the period 1927-1964, a period when they were not considered sinful, whereas they do during the period of 1965-2004. Further, the tobacco industry also supply me with evidence suggesting a link between sin stocks returns in general and tobacco stocks returns in particular and litigation risk.

Given its focus on the American tobacco, alcohol, defence, and gambling industries, this paper formally considers less than the entire universe of sin stocks. The intent, however, is that the setting and general characteristics of the sin stocks studied are representative of all the stocks excluded by sin screens. I leave my findings open to interpretation and encourage future research to

concentrate on longer time-series data and to present complementary evidence from different countries.

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Figure 1: Cigarette Consumption per capita in the United States

Source: Bulow & Klemperer (1998). Per capita consumption is total consumption divided by population 18 years or older.

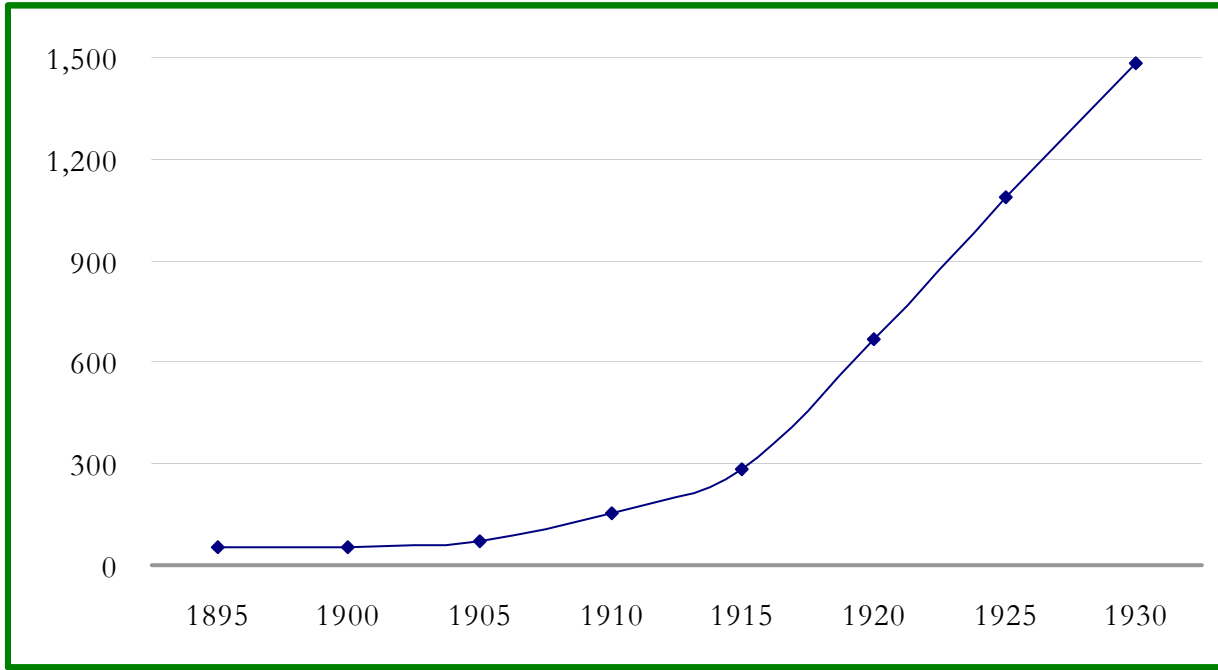


Table 1: Profile of Sin Stocks

This table reports summary statistics about the sin stocks included in this investigation. In Panel A, I report the number of sin stocks that is included in each of the four sub-categories of alcohol, tobacco, guns-defence, and gaming. In Panel B I report summary statistics on 49 Fama and French (1997-revised) industries plus my additional 50th gambling industry portfolio. In all relevant cases results are calculated using equally weighted portfolios. The sample period is 1985-2004 and the returns are on monthly basis. The results are **not** net of the risk free rate. Average firm sizes are in million U.S. dollars as of 31/12/2004. Besides industry returns I also provide summary statistics on the relevant market-wide benchmark. Panel C reports summary statistics for the time-series regressions upon which this investigation is based.

Panel A: Yearly Distribution

Period	All	Alcohol	Tobacco	Defense	Gambling
1985	29	10	4	9	6
1986	30	11	4	9	6
1987	34	11	5	10	8
1988	37	13	5	10	9
1989	40	14	5	10	11
1990	45	14	5	12	14
1991	46	15	5	12	14
1992	50	17	5	12	16
1993	62	17	5	12	28
1994	67	18	5	13	31
1995	97	26	7	16	48
1996	105	30	8	17	50
1997	111	33	9	18	51
1998	106	33	9	19	45
1999	109	34	9	20	46
2000	106	35	9	21	41
2001	110	34	9	24	43
2002	108	31	10	25	42
2003	104	30	10	24	40
2004	103	30	10	24	39
TOTAL	148	40	15	27	66

Panel B: Market Betas

Industry	Return	Beta	Standard Deviation	Sharpe Ratio	Average Size	# of Firms
(1) Agriculture	1.05	0.74	7.99	0.11	759	11
(2) Food	1.12	0.65	4.11	0.23	3213	60
(3) Soda	1.34	0.77	7.48	0.16	2635	8
(4) Beer	1.26	0.64	4.82	0.23	15867	15
(5) Smoke	1.93	0.74	9.32	0.19	26947	5
(6) Toys	0.86	0.92	6.81	0.10	862	29
(7) Fun	1.06	0.96	6.77	0.13	2885	50
(8) Books	1.15	0.95	5.35	0.19	2846	36
(9) Household	0.93	0.86	5.37	0.14	5068	53
(10) Clothes	0.95	0.90	5.99	0.13	1157	62
(11) Health	1.28	0.96	6.80	0.16	1273	74
(12) Medical Equipment	1.62	1.03	6.88	0.21	1738	159
(13) Drugs	2.07	1.35	9.70	0.20	3472	313
(14) Chemicals	1.13	0.91	5.14	0.19	3248	71
(15) Rubber	1.22	0.79	5.35	0.20	592	32
(16) Textiles	0.58	0.84	6.44	0.06	782	11
(17) Build Materials	1.28	0.85	5.25	0.21	1973	66
(18) Construction	0.98	1.03	7.11	0.12	1986	45
(19) Steel	1.01	1.06	6.65	0.13	1944	47
(20) Fabricated Products	0.75	0.90	6.43	0.09	178	13
(21) Machinery	1.27	1.04	6.08	0.18	1980	134
(22) Electrical Equipment	1.12	1.01	6.38	0.15	1203	67
(23) Autos	1.01	0.97	6.23	0.14	2241	53
(24) Aero	1.26	0.79	5.94	0.19	8369	17
(25) Ships	0.95	0.84	6.90	0.11	2598	10
(26) Guns	1.55	0.79	7.32	0.19	3345	10
(27) Gold	1.38	0.31	11.86	0.10	2730	9
(28) Mines	1.30	0.70	7.37	0.15	1842	11

(29) Coal	0.79	0.46	9.85	0.06	2456	6
(30) Oil	1.33	0.70	6.81	0.17	6310	135
(31) Utilities	1.17	0.39	3.32	0.30	4128	111
(32) Telecommunication	1.45	1.39	8.45	0.15	6078	124
(33) Personal Services	1.07	0.95	6.28	0.14	1083	56
(34) Business Services	1.27	1.05	6.35	0.18	1221	243
(35) Hardware	1.53	1.54	10.06	0.14	4354	111
(36) Software	1.55	1.53	10.12	0.14	2678	382
(37) Chips	1.79	1.48	9.47	0.17	2385	291
(38) Laboratory Equipment	1.57	1.17	7.51	0.19	802	104
(39) Paper	1.10	0.80	4.65	0.20	4148	45
(40) Boxes	1.36	0.85	6.67	0.18	1719	12
(41) Transport	1.20	0.96	5.75	0.18	2392	98
(42) Wholesalers	1.09	0.91	5.65	0.16	1099	145
(43) Retailers	1.01	1.05	6.41	0.13	4142	226
(44) Meals	0.78	0.76	5.42	0.11	1906	75
(45) Banks	1.55	0.58	4.19	0.33	2531	673
(46) Insurance	1.30	0.70	4.22	0.27	5470	155
(47) Real Estate	0.62	0.58	5.88	0.08	1614	23
(48) Financials	1.41	0.92	5.71	0.22	3675	85
(49) Other	0.86	1.04	6.77	0.10	11123	41
(50) Gambling	2.45	0.89	7.74	0.30	1871*	39
CRSP	1.30	1.00	5.64	0.20	2971	4612

* The average firm size for the 39 companies included in the sample as of January 2006.

Panel C: Summary Statistics for Time-Series Return Regressions

Tobacco_t is the monthly return, net of the risk-free rate, for an equal weighted portfolio of tobacco related stocks. Alcohol_t is the monthly return, net of the risk-free rate, for an equal weighted portfolio of alcohol related stocks. Defence_t is the monthly return, net of the risk-free rate, for an equal weighted portfolio of weapon related stocks. Gambling_t is the monthly return, net of the risk-free rate, for an equal weighted portfolio of gaming related stocks. SINP_t is the monthly return, net of the risk-free rate, for an equal weighted portfolio of sin stocks. COMP_t is the monthly, net of the risk-free rate, return for an equal weighted portfolio of stocks considered to be comparable to sin stocks: these are stocks from the Fama and French (1997-revised) industry groups 2 (food), 3 (soda), 7 (fun), 21 (machinery), 22 (electrical equipment) and 44 (meals and hotels). TRIUMP_t is the monthly return, net of the risk-free rate, for an equal weighted portfolio of sin stocks exclusive of the defence industry group. TRIUMCOMP_t is the monthly return, net of the risk-free rate, for an equal weighted portfolio of stocks considered to be comparable to the triumvirate of sin: these are stocks from the Fama and French (1997-revised) industry groups 2 (food), 3 (soda), 7 (fun), and 44 (meals and hotels). MKT_t represents the return on the market proxy (the equal weighted CRSP index) in excess of the risk-free rate, SMB_t denotes the difference in return between a small cap portfolio and a large cap portfolio, HML_t denotes the return spread between a value portfolio and a growth portfolio and MOM_t is the return difference between a prior 12-month winner portfolio and a prior 12-month loser portfolio.

Variable	Return	Standard Deviation
Tobacco (%)	1.10	6.80
Alcohol (%)	0.98	4.54
Defence (%)	1.77	7.18
Gambling (%)	2.07	7.79
SINP (%)	1.54	5.02
COMP (%)	0.63	5.29
TRIUMP (%)	1.50	5.12
TRIUMCOMP (%)	0.52	4.98
MKT (%)	0.86	5.63
SMB (%)	0.10	3.90
HML(%)	0.62	3.55
MOM (%)	0.80	4.59

Table 2: Return Performance of Individual Sin Stock Groups

This table reports the results for the time-series regressions for the different asset classes of sin stocks. Alcohol is the excess monthly return net of the risk-free (1 month T-bill) for an equal weighted portfolio of alcohol stocks. Defence is the excess monthly return net of the risk-free for an equal weighted portfolio of defence stocks. Gambling is the excess monthly return net of the risk-free for an equal weighted portfolio of gambling stocks. All results are presented in the form of a "fitted" regression equation with standard errors within brackets. MKT represents the return on the market proxy (the equal weighted CRSP index) in excess of the risk-free rate, SMB denotes the difference in return between a small cap portfolio and a large cap portfolio, HML denotes the return spread between a value portfolio and a growth portfolio and MOM is the return difference between a prior 12-month winner portfolio and a prior 12-month loser portfolio. *** 1% significance; ** 5% significance; * 10% significance.

Variable	Alfa	MKT	SMB	HML	MOM	R ² _{adj}
Alcohol	0.4984** (0.2123)	0.5243*** (0.0374)				0.4515
Alcohol	0.4064** (0.1950)	0.6772*** (0.0409)	-0.4029*** (0.0591)			0.5398
Alcohol	0.2847 (0.2045)	0.7222*** (0.0472)	-0.3865*** (0.0595)	0.1308* (0.0697)		0.5446
Alcohol	0.2098 (0.2087)	0.7420*** (0.0486)	-0.3900*** (0.0593)	0.1312* (0.0694)	0.0725* (0.0438)	0.5480
Defence	0.9380*** (0.3134)	0.6391*** (0.0551)				0.3591
Defence	0.8421*** (0.3016)	0.7984*** (0.0633)	-0.4199*** (0.0915)			0.4091
Defence	0.4467 (0.3081)	0.9445*** (0.0712)	-0.3664*** (0.0896)	0.4251*** (0.1050)		0.4453
Defence	0.4075 (0.3161)	0.9549*** (0.0735)	-0.3682*** (0.0898)	0.4253*** (0.1051)	0.0380 (0.0664)	0.4437
Gambling	1.3274*** (0.3916)	0.8808*** (0.0689)				0.4056
Gambling	1.3298*** (0.3933)	0.8767*** (0.0826)	0.0108 (0.1193)			0.4031
Gambling	0.8666** (0.4045)	1.0479*** (0.0934)	0.0734 (0.1176)	0.4980*** (0.1378)		0.4321
Gambling	1.0214** (0.4126)	1.0069*** (0.0960)	0.0807 (0.1172)	0.4972*** (0.1372)	-0.1498* (0.0866)	0.4369
Tobacco	0.6861* (0.4085)	0.4851*** (0.0719)				0.1577
Tobacco	0.5149 (0.3774)	0.7696*** (0.0792)	-0.7500*** (0.1145)			0.2843
Tobacco	0.4139 (0.3982)	0.8069*** (0.0920)	-0.7363*** (0.1158)	0.1086 (0.1357)		0.2832
Tobacco	0.4410 (0.4087)	0.7997*** (0.0951)	-0.7350*** (0.1161)	0.1084 (0.1359)	-0.0262 (0.0858)	0.2804

Table 3: Return Performance of Sin Portfolios and Their Comparables

Panel A reports the results for the time-series regressions of $SINP_t$ (the excess monthly return net of the risk-free for an equal weighted portfolio of sin stocks), $COMP_t$ (the excess monthly return net of the risk-free for an equal weighted portfolio of stocks from Fama and French (1997, restated) industries 2 (food), 3 (soda), 7 (fun), 21 (machinery), 22 (electrical equipment) and 44 (meals and hotels)), and Difference (the return of a portfolio long sin stocks and short their comparables). Panel B reports the results for the time-series regressions of $TRIUMP_t$ (the excess monthly return net of the risk-free for an equal weighted portfolio of sin stocks Fama & French (1997, restated) industries 4 (beer), 5 (smoke) and my additional 50th group (gambling)), and $TRIUMCOMP_t$ (in this scenario the excess monthly return net of the risk-free for an equal weighted portfolio of stocks from Fama and French (1997, restated) industries 2 (food), 3 (soda), 7 (fun) and 44 (meals and hotels)), and Difference (the return of a portfolio long sin stocks and short their comparables). Panel C reports an extension to panel A and B. All results are presented in the form of a "fitted" regression equation with standard errors within brackets. MKT represents the return on the market proxy (the equal weighted CRSP index) in excess of the risk-free rate, SMB denotes the difference in return between a small cap portfolio and a large cap portfolio, HML denotes the return spread between a value portfolio and a growth portfolio and MOM is the return difference between a prior 12-month winner portfolio and a prior 12-month loser portfolio. D/P is the return the return of a portfolio of companies paying the top 30 percent dividends in relation to price *** 1% significance; ** 5% significance; * 10% significance.

Panel A:

Variable	Alfa	MKT	SMB	HML	MOM	R ² _{adj}
SINP	0.8685*** (0.1881)	0.6949*** (0.0331)				0.6489
SINP	0.8072*** (0.1799)	0.7969*** (0.0378)	-0.2687*** (0.0546)			0.6803
SINP	0.5343*** (0.1816)	0.8977*** (0.0419)	-0.2318*** (0.0528)	0.2933*** (0.0619)		0.7069
SINP	0.5531*** (0.1864)	0.8927*** (0.0434)	-0.2310*** (0.0529)	0.2932*** (0.0620)	-0.0181 (0.0391)	0.7060
COMP	-0.1447 (0.0926)	0.9049*** (0.0163)				0.9284
COMP	-0.1599* (0.0919)	0.9300*** (0.0193)	-0.0663** (0.0279)			0.9297
COMP	-0.3775*** (0.0862)	1.0105*** (0.0199)	-0.0368 (0.0251)	0.2340*** (0.0294)		0.9445
COMP	-0.3732*** (0.0884)	1.0093*** (0.0206)	-0.0366 (0.0251)	0.2340*** (0.0294)	-0.0042 (0.0186)	0.9442
<i>Difference</i>	1.0132*** (0.1569)	-0.2100*** (0.0276)				0.1928
<i>Difference</i>	0.9670*** (0.1515)	-0.1332*** (0.0318)	-0.2025*** (0.0459)			0.2511
<i>Difference</i>	0.9118*** (0.1596)	-0.1128*** (0.0369)	-0.1950*** (0.0464)	0.0593 (0.0544)		0.2517
<i>Difference</i>	0.9262*** (0.1638)	-0.1166*** (0.0381)	-0.1943*** (0.0465)	0.0592 (0.0545)	-0.0139 (0.0344)	0.2490

Panel B:

Variable	Alfa	MKT	SMB	HML	MOM	R²_{adj}
TRIUMP	0.8857*** (0.2092)	0.7045*** (0.0368)				0.6056
TRIUMP	0.8334*** (0.2043)	0.7913*** (0.0429)	-0.2287*** (0.0620)			0.6255
TRIUMP	0.5906*** (0.2100)	0.8810*** (0.0485)	-0.1959*** (0.0611)	0.2611*** (0.0715)		0.6441
TRIUMP	0.6340*** (0.2152)	0.8696*** (0.0501)	-0.1938*** (0.0611)	0.2609*** (0.0716)	-0.0420 (0.0452)	0.6439
TRIUMCOMP	-0.1642 (0.1415)	0.7980*** (0.0249)				0.8117
TRIUMCOMP	-0.1817 (0.1412)	0.8271*** (0.0296)	-0.0767* (0.0428)			0.8134
TRIUMCOMP	-0.5130*** (0.1327)	0.9495*** (0.0306)	-0.0319 (0.0386)	0.3562*** (0.0452)		0.8518
TRIUMCOMP	-0.4974*** (0.1361)	0.9453*** (0.0317)	-0.0312 (0.0387)	0.3561*** (0.0453)	-0.0151 (0.0286)	0.8513
<i>Difference</i>	1.0499*** (0.1776)	-0.0934*** (0.0312)				0.0323
<i>Difference</i>	1.0152*** (0.1754)	-0.0358 (0.0368)	-0.1520*** (0.0532)			0.0607
<i>Difference</i>	1.1036*** (0.1844)	-0.0684 (0.0426)	-0.1639*** (0.0536)	-0.0951 (0.0628)		0.0658
<i>Difference</i>	1.1313*** (0.1891)	-0.0758* (0.0440)	-0.1626*** (0.0537)	-0.0952 (0.0629)	-0.0269 (0.0397)	0.0636

Panel C:

Variable	Alfa	MKT	SMB	HML	MOM	D/P	R²_{adj}
SINP	0.4918** (0.1956)	0.7744*** (0.1228)	-0.1776** (0.0740)	0.2238** (0.0916)	-0.0225 (0.0394)	0.1535 (0.1490)	0.7060
COMP	-0.3398*** (0.0928)	1.0738*** (0.0582)	-0.0657* (0.0351)	0.2719*** (0.0434)	-0.0018 (0.0187)	-0.0837 (0.0707)	0.9443
<i>Difference</i>	0.8316*** (0.1711)	-0.2995*** (0.1075)	-0.1119* (0.0648)	-0.0480 (0.0801)	-0.0207 (0.0344)	0.2371* (0.1304)	0.2563
TRIUMP	0.5543** (0.2257)	0.7156*** (0.1417)	-0.1244 (0.0854)	0.1705 (0.1057)	-0.0477 (0.0454)	0.1997 (0.1719)	0.6444
TRIUMCOMP	-0.6055*** (0.1413)	0.7364*** (0.0887)	0.0630 (0.0535)	0.2335*** (0.0662)	-0.0229 (0.0284)	0.2709** (0.1077)	0.8546
<i>Difference</i>	1.1598*** (0.1988)	-0.0208 (0.1249)	-0.1874** (0.0753)	-0.0630 (0.0931)	-0.0248 (0.0400)	-0.0713 (0.1515)	0.0605

Table 4: Impact of Time-Variations in Social Norms

This table reports the results for the time-series regressions of TOBP (the excess monthly return on tobacco industry net of the risk-free) net of FOODP (the excess monthly return on food industry net of the risk-free) *difference* is the return of a portfolio long tobacco stocks and short food stocks) for two sub-periods: 1927 – 1964 and 1965 – 2004. Unlike previous tables the variables in this table are value weighted. The results are presented in the form of a "fitted" regression equation with standard errors within brackets. MKT represents the return on the market proxy (the value weighted CRSP index) in excess of the risk-free rate, SMB denotes the difference in return between a small cap portfolio and a large cap portfolio, HML denotes the return spread between a value portfolio and a growth portfolio and MOM is the return difference between a prior 12-month winner portfolio and a prior 12-month loser portfolio. *** 1% significance; ** 5% significance; * 10% significance.

Variable	Alfa	MKT	SMB	HML	MOM	R ² _{adj}
TOBP (1927-1964)	0.1606 (0.1682)	0.6078*** (0.0321)	-0.0967* (0.0519)	0.0283 (0.0514)	-0.0234 (0.0389)	0.5539
FOODP (1927-1964)	0.0969 (0.0998)	0.8060*** (0.0191)	-0.0046 (0.0308)	-0.0962*** (0.0305)	0.0247 (0.0231)	0.8469
<i>Difference</i> (1927-1964)	0.0637 (0.1558)	-0.1983*** (0.0298)	-0.0921* (0.0481)	0.1245*** (0.0476)	-0.0482 (0.0360)	0.1015
TOBP (1965-2004)	0.8962*** (0.3015)	0.8220*** (0.0695)	-0.2876*** (0.0951)	0.1243 (0.1050)	-0.0292 (0.0766)	0.2361
FOODP (1965-2004)	0.2365 (0.1572)	0.7869*** (0.0362)	-0.1486*** (0.0496)	0.2130*** (0.0547)	0.0228 (0.0400)	0.5098
<i>Difference</i> (1965-2004)	0.6597** (0.2852)	0.0352 (0.0657)	-0.1390 (0.0900)	-0.0887 (0.0993)	-0.0520 (0.0725)	-0.0018

Table 5: Impact of Litigation Risk for Tobacco Stocks

This table reports results of time-series regressions including only tobacco stocks. These time-series regressions of Tobacco (the excess monthly return on tobacco industry net of the risk-free) are divided into two sub-periods: 198501-199706 and 199707-200412. The results are presented in the form of a "fitted" regression equation with standard errors within brackets. MKT represents the return on the market proxy (the equal weighted CRSP index) in excess of the risk-free rate, SMB denotes the difference in return between a small cap portfolio and a large cap portfolio, HML denotes the return spread between a value portfolio and a growth portfolio and MOM is the return difference between a prior 12-month winner portfolio and a prior 12-month loser portfolio. *** 1% significance; ** 5% significance; * 10% significance.

Variable	Alfa	MKT	SMB	HML	MOM	R ² _{adj}
Tobacco (8501 - 9706)	0.7401 (0.4587)	0.5839*** (0.0949)				0.1996
Tobacco (8501 - 9706)	0.3924 (0.4218)	0.8340*** (0.0971)	-0.9196*** (0.1636)			0.3375
Tobacco (8501 - 9706)	0.6388 (0.4548)	0.7548*** (0.1117)	-0.8804*** (0.1653)	-0.3121 (0.2198)		0.3421
Tobacco (8501 - 9706)	0.5325 (0.4775)	0.7554*** (0.1118)	-0.8398*** (0.1744)	-0.2870 (0.2227)	0.1339 (0.1808)	0.3401
Tobacco (9707 - 0412)	0.5757 (0.7774)	0.4051*** (0.1133)				0.1169
Tobacco (9707 - 0412)	0.6039 (0.7296)	0.7007*** (0.1344)	-0.6360*** (0.1769)			0.2223
Tobacco (9707 - 0412)	0.1111 (0.7694)	0.8647*** (0.1604)	-0.5511*** (0.1808)	0.3800* (0.2090)		0.2423
Tobacco (9707 - 0412)	0.2843 (0.7860)	0.7886*** (0.1757)	-0.5027*** (0.1863)	0.3810* (0.2088)	-0.1273 (0.1200)	0.2434

APPENDIX: LIST OF SIN STOCKS (1985-2004)

This appendix list the sin stocks, including exchange listing, company name, start year in the sample and end year in the sample.

Exchange	Company Name	Start	End
NASNM	ACRES GAMING INCORPORATED	1995	2003
NASNM	ADVANCED TECHNICAL PRODUCTS, INC.	1995	2002
NASB	ADVANCED TOBACCO PRODUCTS, INC.	1996	2003
NYSE	Alliance Gaming Corp.	1985	2004
NYSE	Alliant Tech System Inco	1990	2004
ASE	Allied Defense Group Inc	1985	2004
NYSE	Altria Group	1985	2004
NASB	American Ammunition Inc	2001	2004
	AMERICAN MAIZE-PRODUCTS COMPANY	1995	1995
NYSE	American Real Estate Partners LP	1987	2004
NASB	American Wagering Inc	1996	2004
NASNM	Ameristar Casinos Inc	1993	2004
NASNM	ANCHOR GAMING	1995	2001
NYSE	Anheuser-Busch Companies Inc	1985	2004
NASB	Archon Corp.	1993	2004
NYSE	Argosy Gaming Company	1993	2004
NYSE	Aztar Corp.	1990	2004
NYSE	Ball Corp.	1985	2004
NASNM	BALLY S GRAND, INC.	1995	1998
NASNM	BERINGER WINE ESTATES HOLDINGS, INC.	1997	2000
NNASO	Big Buck Brewery & Steakhouse	1999	2002
NASNM	BLACK HAWK GAMING & DEVELOPMENT CO., INC	1995	2002
NYSE	Blount International Inc	1999	2004
NASB	BOARDWALK CASINO	1995	1998
NYSE	Boeing Company	1985	2004
NASNM	BOOMTOWN, INC.	1995	1997
NYSE	Boston Beer Company Inc	1996	2004
NNASO	Bounceback Technologies	1993	1998
NYSE	Boyd Gaming Corp.	1993	2004
NYSE	Brown-Forman Corp.	1985	2004
NYSE	CAESARS ENTERTAINMENT, INC.	1999	2004
NNASO	Capital Gaming International Inc	1990	1995
NNASO	Caribbean Cigar Company	1996	1998
NASNM	CASINO DATA SYSTEMS	1995	2001
NASNM	Century Casinos Inc	1993	2004

NASNM	CHALONE WINE GROUP, LTD. (THE)	1995	2004
NYSE	Coca Cola Company	1985	2004
NNASO	Colorado Casino Resorts Inc	1995	1999
NYSE	Constellation Brands Inc	1986	2004
NNASO	Creative Gaming Inc	1989	1997
ASE	Cruzan International Inc	1992	2004
NASB	Defense Industries International Inc	2001	2004
NASB	Diamondhead Casino Corp.	1989	2004
NYSE	Dover Downs Gaming & Entertainment	2002	2004
NYSE	Dover Motorsports Inc	1996	2004
NYSE	Ducommun Inc	1985	2004
NASNM	Empire Resorts Inc	1994	2004
NYSE	Esco Technologies Inc	2000	2004
NASNM	ESKIMO PIE CORPORATION	1995	2000
NASB	Firearms Training Systems Inc	1996	2004
NASB	Florida Gaming Corp.	1993	2004
NYSE	Fortune Brands Inc	1985	2004
ASE	Full House Resort Inc	1993	2004
NYSE	Gaming Corp Of American	1995	1995
NASNM	Gaming Partners International Corp.	1994	2004
NNASO	GB Holdings Inco	2001	2004
NYSE	Gencorp Inc	1985	2004
NYSE	GENERAL CIGAR HOLDINGS, INC.	1997	2000
NYSE	General Dynamics	1985	2004
NASB	Genesee Corp.	1985	2004
NASB	Global Casinos Inc	1987	1999
NASNM	GOLDEN STATE VINTNERS, INC.	1998	2004
NYSE	GRAND GAMING	1995	1995
NYSE	Harrahs Entertainment Inc	1990	2004
NYSE	HARVEYS CASINO RESORTS	1995	1999
ASE	Hi Shear Technology Corp.	1994	2004
NYSE	Hilton Hotels Corp.	1985	2004
NNASO	Holly Holdings Inc	1995	1997
	HOLLYWOOD CASINO CORPORATION	1995	2003
NNASO	Independence Brewing Company	1997	1999
NYSE	International Game Technology	1985	2004
NNASO	International Thoroughbreds Breeders	1985	1997
NASNM	Isle Of Capris Casinos Inc	1992	2004
NYSE	ITT CORPORATION	1996	1998
NASB	JCC HOLDING COMPANY	2001	2002
NNASO	Lakes Entertainment Inc	1999	2004
	LAS VEGAS ENTERTAINMENT NETWORK, INC.	1995	1997

NYSE	Leucadia National Corp.	1985	2004
NASNM	LION BREWERY, INC., (THE)	1996	1998
NASB	Lion-GRI International Inc	2000	2004
NASB	Littlefield Corp.	1994	2004
NYSE	Lockheed Martin Corp.	1995	2004
NYSE	Loews Corp Carolina Group	2002	2004
NYSE	Loews Corp.	1985	2004
NNASO	Lottery & Wagering Inc	1997	1999
NYSE	M & F Worldwide Corp.	1995	2004
NYSE	MANDALAY RESORT GROUP	1995	2004
NNASO	MBC Holding Company	1993	2001
NASB	Mendocino Brewing Company	1995	2004
NYSE	MGM Mirage Inc	1988	2004
NASNM	MGP Ingredients Inc	1988	2004
NASNM	Mikohn Gaming Corp.	1993	2004
NYSE	Molson Coors Brewing Company	1985	2004
NASNM	Monarch Casino & Resort Inc	1993	2004
NASNM	MONDAVI (ROBERT) CORPORATION	1995	2004
NASNM	MTR Gaming Group Inc	1993	2004
NASNM	Multimedia Games Inc	1999	2004
ASE	National Beverage Corp.	1991	2004
ASE	Nevada Gold & Casinos Inc	1999	2004
NNASO	Nor Wester Brewing Company	1996	1997
NYSE	Olin Corp.	1985	2004
NYSE	Orbital Sciences Corp.	1990	2004
NASNM	OROAMERICA, INC.	1995	2001
NNASO	Pavichevich Brewing Company	1989	1992
NASNM	Penn National Gaming	1994	2004
NYSE	Pepsico Inc	1985	2004
NASNM	PETE S BREWING COMPANY	1995	1998
NNASO	Phlo Corp.	1999	2001
NYSE	Pinnacle Entertainment Inc	1985	2004
NASNM	PURE WORLD, INC.	1995	2004
NASNM	Pyramid Breweries Inc	1996	2004
NASNM	RAVENSWOOD WINERY, INC.	1999	2001
NASNM	Redhook ALE Brewery Inc	1995	2004
NYSE	Reynolds American Inc	1999	2004
ASE	Riviera Holdings	1996	2004
NASNM	Scheid Vineyards Inc	1997	2004
NYSE	Schweitzer-Mauduit International	1995	2004
ASE	Seaboard Corp.	1985	2004

NYSE	Sequa Corp.	1987	2004
NASNM	Shuffle Master Inc	1992	2004
NASB	SILICON GAMING, INC.	1996	1999
ASE	Smith & Wesson Holding Corp	1998	2004
NASB	Spacedev Inc Commerce	1997	2004
NASNM	Spacehab Inc	1999	2004
NASB	Spectrum Sciences & Software Holdings	2002	2004
NNASO	Sport Of Kings Inc	1985	1993
	STANDARD COMMERCIAL CORPORATION	2001	2004
NASNM	Star Scientific Inc	2000	2004
NNASO	Starmet Corp.	1985	1998
NYSE	Station Casinos Income	1993	2004
	STEARNS & LEHMAN INC	1988	2004
NASB	STRATOSPHERE CORPORATION	1995	1997
NYSE	Sturm Ruger & Company Inc	1985	2004
NYSE	SWISHER INTERNATIONAL GROUP INC.	1996	1999
NASNM	Taser International Inc	2001	2004
ASE	TECHNOLOGY FLAVORS & FRAGRANCES, INC.	2000	2004
NASNM	The Sands Regent	1985	2004
NASB	Trans World Corp.	1995	2004
NYSE	UNITED DEFENSE INDUSTRIES, INC.	2002	2004
NYSE	Universal Corp.	1985	2004
NYSE	UST Inc	1985	2004
NYSE	Vector Group Limited	1987	2004
NAS	VENTURIAN CORP.	1995	2001
ASE	Vermont Pure Holdings Limited	1992	2004
NASNM	Wilamette Valley Vineyards	1994	2004
NASNM	Wynn Resorts Limited	2002	2004
NASB	Xstream Beverage Network Inc	2001	2004
NASNM	Youbet Inc	1999	2004

The legend for the exchanges is as follows: ASE – American Stock Exchange
 NASB – NASDAQ International Market
 NASNM – NASDAQ National Market
 NNASO – NASDAQ Non-Bulletin Board
 NYSE – New York Stock Exchange.