The Quarterly Review of Economics and Finance 59 (2016) 63–70

Contents lists available at ScienceDirect

The Quarterly Review of Economics and Finance

journal homepage: www.elsevier.com/locate/qref

Sin stock returns and investor sentiment

Daniel Perez Liston*

University of St. Thomas-Houston, Economics and Finance, 3800 Montrose, Houston, TX 77006, USA

ARTICLE INFO

Article history:
Received 15 December 2014
Received in revised form 28 July 2015
Accepted 12 August 2015
Available online 20 August 2015

Keywords:
Sin stocks
Investor sentiment
GARCH
CAPM

JEL classification:
G00
G02
G19

ABSTRACT

This paper studies the impact of investor sentiment on a portfolio formed of sin stocks—publicly traded companies in the alcohol, tobacco, and gaming industries. Using a variety of sentiments-augmented asset pricing models, this research examines whether investor sentiment is a risk factor for sin stock returns. It also studies if the abnormal returns – found in the literature – for sin stocks persist after controlling for investor sentiment. Furthermore, we utilize a generalized autoregressive conditional heteroscedasticity-in-mean (GARCH) model to study the relationship between investor sentiment and the sin portfolio's conditional volatility. Our findings show that both individual and institutional investor sentiment are priced factors in sin stock returns. Furthermore, after controlling for the role of investor sentiment, the asset-pricing results suggest that the abnormal returns for sin stocks found in previous studies disappear. The results from the GARCH models indicate that investor sentiment has a significant impact on sin stocks' conditional volatility.

1. Introduction

Sin stocks are shares of companies whose main business activities include gambling, tobacco, and alcohol. The disdain of sin stocks by some investors and their unique risk-return characteristics make them good candidates for academic research. For example, the Vice Fund, created in 2002, caters to sin investors. Since inception, the fund has had an average annualized return of 7%, which is higher than the 5% return of the S&P 500 over that same period. Additionally, according to a 2007 report by The Social Investment Forum, about one out of every nine dollars under professional management in the U.S. conforms to socially responsible investing criteria. This paper continues the ongoing conversation for sin stocks and extends it by examining the relationship between sin investing and both individual and institutional investor sentiments.

The literature for sin investing is in its early stages. One of the most significant findings for these stocks is that they generate high risk-adjusted returns in the form of positive and significant Jensen's alpha[1] (Durand, Koh, & Limkriangkrai, 2013; Sauer, Schneider, & Sheikh, 2013; Hong & Kacperczyk, 2009; Fabozzi, Ma, & Oliphant, 2008; Salaber, 2007a). These risk-adjusted returns are inconsistent with the CAPM. Some attribute the over performance of sin stocks to neglect by norm-constrained investors (Hong & Kacperczyk, 2009). That is, because some investors are unwilling to hold sin stocks, a premium is generated in the form of larger returns to entice the investors that are willing to buy these stocks. This view is also consistent with the Heinkel, KCus, and Zechner (2001) model of pollution and with Merton's (1987) model of incomplete information. Some academic studies have tried to find alternative explanations for these large risk-adjusted returns. For instance, Kim and Venkatachalam (2011) investigate if the high returns can be explained by greater information risk (i.e., poor financial reporting quality). They find that sin stocks in fact exhibit superior financial reporting quality, when compared to a control group, and as a result cannot explain the high risk-adjusted returns for sin stocks. Other research has compared sin stock returns to their ethical counter parts. For example, Perez Liston and Soydemir (2010) show that a sin portfolio outperformed a faith-based portfolio and at the same time the sin portfolio exhibited a lower degree of systematic risk (i.e., lower beta). Similarly, Lobe and Roithmeier (2008) compare unethical and socially responsible stocks and find that unethical stocks (sin stocks) exhibit a superior risk-return tradeoff.

A major limitation of the aforementioned studies is that they do not shed light on the possible relationship between investor sentiment and sin stock returns. Baker and Wurgler (2007) define investor sentiment as, "a belief about future cash flows and investment risks that is not justified by the facts at hand" (p.129). There is a growing body of literature relating investor sentiment to the

* Corresponding author. Tel.: +1 713 942 3499.
E-mail address: drperez@stthom.edu

[1] See Jensen (1968) for more details.

http://dx.doi.org/10.1016/j.qref.2015.08.004

return generating process of stock market returns (Lee, Shleifer, & Thaler, 1991; Lee, Jiang, & Indro, 2002; Brown & Cliff, 2004, 2005; Baker & Wurgler, 2007; Verma, Baklaci, & Soydemir, 2008; Ho & Hung, 2009; Baker, Wurgler, & Yuan, 2012)[2]. For the U.S., studies have found that investor sentiment – noise trading – has an influence on the returns of a variety of stock categories. In particular, their results show that harder to arbitrage stocks (e.g., those with low market capitalization, high volatility, high earnings growth, and firms in financial distress) are more susceptible to noise trading (Baker & Wurgler, 2007). Additionally, Lee et al. (2002) shows that excess returns are significantly and positively correlated with changes in investor sentiment. They show that bullish shifts in sentiment are associated with lower future volatility. Studies have also shown that the influence of investor sentiment on stock returns in not just a U.S. phenomena. For example, Baker et al. (2012) find that various foreign stock markets are influenced by both "global" and "local" investor sentiment factors. They also find that global sentiment is contagious across markets and the mechanism that might propagate this spillover is capital flows. Schmeling (2009) examine whether investor sentiment – in the form of consumer confidence – impacts future stock returns for 18 industrialized countries. Their results indicate that sentiment can forecast equity returns for most of these countries. In general, these studies document a positive contemporaneous relationship between investor sentiment and stock market returns.

There is evidence in both the sin stock and investor sentiment literature which suggests that sin stocks might be susceptible to waves of both individual and institutional investor sentiment. First, the literature has shown that stocks with a high concentration of retail investors exhibit excess return co-movement, which is consistent with these stocks being influenced by investor sentiment (Kumar & Lee, 2006). The results found in Kumar and Lee (2006) suggests that sin stocks might be influenced by investor sentiment. This is due to the fact that sin stocks exhibit greater levels of retail investor ownership and therefore might be harder to arbitrage (Hong & Kacperczyk, 2009). Second, Hong and Kacperczyk (2009) find that there is less analyst coverage for sin stocks. The literature has shown that low levels of analyst coverage can lead to stock undervaluation (Doukas, Kim, & Pantzalis, 2005), which in turn could lead to more noise trading. The low number of analysts covering sin stocks could imply that sin stocks might be susceptible to noise trading. Third, Baker and Wurgler (2006) suggest that firms with similar characteristics (e.g., stocks in the same industry or with similar earnings growth) may be vulnerable to waves of investor sentiment. Despite the fact that sin stocks come from at least three different industries, many individual and retail investors view them as being grouped into a single industry, which is the "sin industry." Therefore, it is plausible that noise traders might "industry" herd in and out of sin stocks which could lead to equity pricing errors. Finally, Kim and Venkatachalam (2011) find that social norms – which are non-financial attributes – might play a role in the return generating process for sin stocks.

Historically, the sin stock literature conducts its empirical analyses through the prism of neoclassical finance. In this paper, we argue that a behavioral approach, which accounts for the role of investor sentiment, is a suitable paradigm when examining sin stocks. In particular, we hypothesize that the introduction of investor sentiment in the asset pricing equations causes abnormal sin stock performance to vanish. By introducing investor sentiment into an asset pricing framework, we allow for a behavioral explanation of sin stock returns. The previous literature for sin stocks returns has not examined whether behavioral models, like De Long, Shleifer, Summers, and Waldmann (1990), DSSW hereafter, are consistent with sin returns.

This paper contributes to the literature by linking the sin stock literature with the investor sentiment literature. First, using sentiments-augmented asset pricing models, we investigate the relation between investor sentiment and sin stock returns to determine whether both individual and institutional investor sentiment influence sin portfolio returns. Second, we investigate if behavioral risk factors can explain the over performance found for sin stocks in the literature. Third, we use a GARCH model to examine if sin stock conditional volatility influences sin stock portfolio returns. Furthermore, we study if sin stock returns exhibit volatility clustering and leverage effects. Finally, we extend the volatility analysis by examining the impact of investor sentiment on the sin portfolio's conditional volatility.

The results from the sentiments-augmented asset pricing models suggest that both individual and institutional investor sentiment have a positive impact on sin returns. The results also show that after controlling for investor sentiment Jensen's alpha disappears in most asset pricing model specifications. This finding indicates that investor sentiment – rather than limited risk sharing as posited in the literature – might be driving the large risk-adjusted returns found in the literature for sin stocks. In the conditional mean equation, the results from the GARCH estimations also confirm that investor sentiment has a positive impact on sin stock returns. Moreover, the GARCH-in-mean term is positive and significant when individual investor sentiment is included in the model. In the conditional variance equation, GARCH estimations indicate that sin stocks returns exhibit volatility clustering and leverage effects. Furthermore, the evidence suggests that investor sentiment impacts sin stock conditional volatility. Overall, the results from both the augmented-asset pricing and GARCH models support the view that investor sentiment influences sin stock returns.

The remainder of this paper is organized as follows. Section 2 discusses the measurement and data sources used in the empirics. Then, Section 3 discusses the econometric methods used while Section 4 presents the results of the paper. Finally, Section 5 concludes.

2. Measurement and data sources

This section provides a description of the variables used in this study. We follow previous studies and conduct the empirical analysis using monthly data. The sample spans from January 1988 to June 2009. The data are obtained through various sources. The portfolio of sin is constructed using data obtained from The Center for Research in Security Prices (CRSP). Sentiment data are collected through Datastream. The 10-year U.S. Treasury bond, 3-month U.S. T-bill, Aaa corporate bond yield, Baa corporate bond yield, and the inflation rate are all downloaded from the Federal Reserve Bank of St. Louis' website (FRED). The excess return on the market (*EXRm*), small minus big premium (*SMB*), high minus low premium (*HML*), momentum premium (*MOM*), dividend yield for the CRSP value-weighted index (*DY*), and one-month treasury bill rate (*RF*) are all obtained from Ken French's website[3].

2.1. Sin portfolio

The sin portfolio (*SIN*) is defined in a similar manner to Hong and Kacperczyk (2009). It includes only equities that are in the tobacco, alcohol, and gaming industries[4]. Sin stocks are selected

[2] See Hirshleifer (2001) for a comprehensive survey that links investor psychology to the stock market.

[3] I would like to thank Kenneth French for making the data available on his website. http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/.

[4] For more information on the construction of the sin portfolio, see Hong and Kacperczyk (2009) p. 19.