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Oil price risk exposure: The case of the U.S. Travel and Leisure Industry

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ABSTRACT

We investigate the oil price risk exposure of the U.S. Travel and Leisure industry. In this paper, we utilize the Fama–French–Carhart's (1997) four-factor asset pricing model augmented with oil price risk factor. The results of our study suggest that oil price sensitivities vary significantly across six subsectors: airlines, gambling, hotels, recreational services, restaurants and bars, and travel & tourism. The extent of the exposure is generally negative, but it is particularly significant for a number of subsectors including airlines, recreational services and restaurants and bars. We also document that oil price risk exposures vary considerably over time. In particular, the 2007–2009 recession triggered by the U.S. subprime lending crisis has significantly contributed to the oil price risk exposure of airline industry. These results should be of much interest to financial analysts, corporate executives, money managers, regulators, and policy makers.

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1. Introduction

The historically high price of crude oil (U.S. $147 per barrel in July 2008) clearly highlighted the vulnerability of the United States Travel and Leisure sector to oil price shocks. Industry analysts suggest that the level of oil price is likely to be more critical to almost every part of the leisure and tourism value chain. Furthermore, the International Energy Agency (IEA) predicted that oil prices would rise more than U.S. $100 per barrel as soon as the economies around the world recover from recession.[1]

There has long been interest in the extent and effects of oil price exposure on economic activity.[2] However, there has been less research examining the exposure of asset returns to oil price shocks. Several studies estimate oil price risk exposures of equity markets at the aggregate level (e.g., Chen et al., 1986; Driesprong et al., 2008; Jones and Kaul, 1996; Kilian and Park, 2009; Park and Ratti, 2008; Sadorsky, 1999), as well as at the industry level (e.g., Aggarwal, Akhibe, Mohanty, 2012; Gogineni, 2010; Mohanty, Akhigbe, Al-Khyal and Bugshan, 2013; Mohanty and Nandha, 2011a,b; Nandha and Brooks, 2009; Nandha and Faff, 2008; Sadorsky, 2001). Most of these studies at the industry level focus on oil and gas industry and transportation industry. For example, Mohanty and Nandha (2011a) show that oil price exposures vary across subsectors within the U.S. Oil and Gas industry and oil price exposures also vary over time. Similarly, Gogineni (2010) finds evidence that oil price exposures vary significantly across industries. He reports that industries that are heavily dependent on oil prices are most sensitive to oil price shocks. However, none of these prior studies examines the oil price risk exposure of the U.S. Tourism and Leisure industry.

We extend Mohanty and Nandha (2011a) study which analyzes the impact of oil price shocks on the U.S. Oil and Gas industry returns. In this paper, we examine the oil price risk exposure of the U.S. Travel and Leisure industry, as well as for various subsectors within the industry for several reasons. First, Hickman et al. (1987) show how oil shocks affect macroeconomy and economic activities. They argue that the impact of oil shocks on travel and leisure activities stems from the effect of oil price on consumer income. Thus, the travel and leisure industry is susceptible to oil price risk. Therefore, we estimate oil price risk exposure of the travel and leisure industry which is an important sector in the U.S. economy. Second, following the spirit of Fama and French (1997), we

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[1] According to IEA, strong economic growth in emerging economies such as China and India along with maturing of several oil fields will soon lead to an oil price rally in the future.

[2] Mork (1994) surveys a large body of academic research investigating the relation between oil price and macroeconomic variables and finds significant impact of oil price shocks on economic output. In a recent empirical study, Hamilton (2009) finds that shocks to oil prices tend to reduce output growth.

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argue that all industries are not homogeneous. Different industry factors including cost structure, competition, and regulation can have different impacts on industry returns due to changes in oil prices. Third, while profit levels and the stock market performance of the tourism and leisure industry are of interest to policy makers, investors, analysts, among others, there has been little research investigating the relation between oil price changes and stock returns in the U.S. Travel and Leisure industry. Finally, in addition to industry-level analysis, our study also explicitly analyzes the relation between changes in oil prices and stock returns using subsector-level data. Analysis at the subsector level is crucial because aggregate or industry-level analysis may not reveal the true nature of the impact of oil price shocks on individual subsector. Our paper addresses the following questions:

1) Do oil price shocks affect the U.S. Travel and Leisure industry returns?
2) Do oil price shocks have the same effects on returns at the subsector level (e.g., same oil price risk sensitivity for travel and tourism, airlines, gambling, hotels, recreational services, and restaurant and bar subsectors)?
3) Do oil price exposures at the industry level as well as at the subsector level vary over time?
4) Do oil shocks have a significant impact on travel and leisure industry returns during the past three U.S. recessions?

2. Literature review

One of the first studies to investigate the exposure of stock returns to oil price movements was Chen et al. (1986). They find that oil prices have no significant effect on U.S. stock returns for the period 1958 to 1984. Huang et al. (1996) find a similar result using oil price futures and aggregate and industry levels in daily data from the U.S. between the years of 1983 and 1990. Rajgopal (1999) examines the commodity price exposure of oil and gas producers and finds that the commodity price risk disclosures are associated with the market's perception of oil and gas price sensitivity. Sadorsky (2001) examines Canadian oil and gas industry stock market reactions to changes in oil prices using monthly data for the period 1983(Q:4)–1999(Q:4). He finds that stock price returns are sensitive to risk factors, such as market index, interest rate, and oil price. Using monthly data over the 1979–1999 period, Click (2001) examines the long-run exposure of oil companies to oil price changes. He finds that the oil price risk is a significant factor in explaining the stock market returns of oil companies. Using a cointegration analysis, Aleisa, Dibooglu and Hammoudeh (2003) examine long-run relations or co-movements among the U.S. oil prices and the U.S. oil industry's sector stock indices for the period 1995–2001. Their study finds evidence that the changes in oil futures prices affect the oil company stock prices, especially those that are engaged in exploration, production, refining, and marketing services. Using a multifactor regression model, Boyer and Filion (2007) assess the impact of oil shocks on stock returns of Canadian oil and gas companies. Their study finds that the returns on Canadian oil and gas stocks are positively related to crude oil and natural gas prices. They also find that oil and natural gas price risk sensitivities of Canadian oil and gas stocks change significantly over the years 1995–1998 and 2000–2002. Jin and Jorion (2006) investigate the relation between stock return sensitivity of oil and gas producers to commodity prices over the period 1998 to 2001. They find that oil and gas prices have a significant positive effect on firm value. Nandha and Faff (2008) provide evidence that oil price shocks have a negative impact on equity returns for all sectors except for mining and oil and gas industries. Mohanty and Nandha (2011a,b) find evidence that the oil price risk exposure of the U.S. oil and gas industry is positive and significant. Their study shows that that oil price risk exposures vary considerably over time and across subsectors within the oil and gas industry.

However, the literature related to impact of oil shocks on equity returns on the U.S. Tourism and Leisure industry is scant. Kilian (2008) examines effects of oil shocks on economy and finds that energy price shocks have negative effects on restaurant and lodging industry. Kilian (2008) also documents that the sale of airline tickets is adversely affected by energy price shocks. Papatheodorou, Rossello and Xiao (2010) provide linkage to the 2007–09 global economic crisis and the decline in tourism industry. Their findings suggest that a global demand shock, such as a global economic crisis triggered by the 2007–08 U.S. subprime lending debacle, can lead to a decrease in global economic output, an increase in unemployment, and a decrease in consumers' discretionary income. This, in turn, is likely to have an adverse effect on the tourism industry. Thus, during an economic downturn, despite a fall in oil price, a decrease in consumers' discretionary income is likely to have a negative impact on tourism industry's cash flow and earnings. Similarly, Smeral (2009) finds evidence that the 2007–08 global financial crisis has led to the decline in European tourism. He argues that a decrease in demand on tourism activities depends on income and price elasticity. In this paper, we hypothesize that the U.S. Travel and Leisure industry is likely to be adversely affected either by an increase in oil price or by a decrease in consumers' discretionary income.[3]

3. Oil price shocks and the U.S. Travel and Leisure Industry Returns

Using a simple illustration, Huang et al. (1996) find that macroeconomic variables such as oil price can have a significant impact on the stock return of a firm. It is well known that the market value of a firm is affected by systematic movements in expected cash flow and discount rates. Thus, an increase in oil price can have a positive or negative effect on a firm's value depending on whether the firm uses oil as an input (consumer of resources) or output (producer of resources). Similarly, the change in oil prices can also affect discount rates for various reasons. The expected discount rate is composed of the expected inflation rate and the expected real interest rate. Since oil is a commodity, changes in oil prices may track the inflation rate, leading to an increase in the expected discount rate. It is likely that an increase in the expected discount rate can lead to an increase in cost of capital for a firm, and a higher cost of capital will have a negative impact on a firm's value. Thus, the true relation between changes in oil prices and returns on equity at the industry level depends on net effects due to changes in expected cash flow and expected discount rates at the firm level.

The travel and leisure industry is one of the largest in the U.S. However, the effects of oil shocks on equity returns at the industry level may greatly differ due to several factors. First, the effect of oil shocks on a specific industry could be positive or negative depending on whether the industry is a net producer or net consumer of oil (e.g., Huang et al., 1996; Nandha and Brooks, 2009; Nandha and Faff, 2008).[4] For example, tourism and leisure sector is considered to be net consumer of oil. Hence, one would expect lower industry returns due to cost pressures arising from higher energy prices. Second, a rise in oil price may induce resource reallocation (Hamilton, 1996; Pindyck, 1991) from more adversely affected sectors to less adversely affected sector, which in turn, may affect an industry's expected future cash flow and earnings. Third, Kilian (2008) suggests that oil price shocks may have different effects on the real economy depending on whether oil shocks are attributed to either global supply shocks or to global demand shocks

[3] For example, the recreational activities and vacations are considered to be luxuries, so they have relatively high income elasticity. Similarly, travel or tourism is considered complementary with gasoline, so the demand on them is likely to fall as price of gasoline goes up.

[4] Jin and Jorion (2006) find that the market recognizes the effect of hedging activities on the stock's exposure to commodity prices. However, they also find that more hedging is not necessarily associated with greater market values of firms. Tufano (1998) suggests that managers who hold more stocks tend to undertake more hedging activities, providing support for the managerial risk aversion theory.

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