Information Spillover Effects between the Commodity and the Stock Markets

Master Thesis

Financial Economics/Banking

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Executive Summary

Problem

Is there a lead-lag relation between the commodity and stock market? The purpose of this study is twofold. At first there is an investigation as to whether or not there are information spillovers between the commodity and the stock market. The primary question is whether the stock market leads the commodity market or vice versa. Therefore, an examination is conducted as to whether the sentiment scores measured by Thomson Reuters News Sentiment Engine (RNSE) provide any useful information on future market movements within and across markets. The study focuses on daily spillover effects from returns and news sentiment scores.

Method

To assess short-term relations the data for this study utilizes time series of daily stock and commodity market index returns as well as time series of the indices sentiment scores measured by the RNSE from 1st January 2003 to 31st August 2010. The S&P 500 Total Return index and the DJ-UBSCI are taken as representatives for the US stock and the commodity market. Bloomberg provides the returns and RNSE the sentiment scores for individual stocks and commodities. Due to the fact that the RNSE does not offer sentiment scores for entire indices, the first step was to model and develop index approximations for the sentiments. To allow the relation between the commodity and the stock market to vary for different business cycles the data additionally is divided into three sub-periods defined by suggestions of the latest announcement of the National Bureau of Economic Research (NBER) on 20th September 2010.

Four different VAR models and two VARX models were developed and examined in order to investigate the information spillover effects across the markets. To visualize the findings the study uses impulse response functions, which base on VMA (vector moving average) estimations.

Result

The results presented in this work confirm that there is an interconnection between the Commodity and the Stock Market. There is evidence for various information spillovers across the markets from returns as well as from news sentiments.

By examining the coefficients of the VAR models it is conspicuous that daily returns seem to have more predictive power than the daily sentiment scores. There is evidence for positive spillovers from returns of the stock market to the commodity market and vice versa. Thus, the magnitude of the coefficients exhibits an increasing tendency from one business cycle to another. Together with the findings of the growing correlations between the two markets it supports the theory that the commodity and the stock market are converging. The coefficients also suggest spillovers from the returns to the sentiments across markets. For the expansion period there is evidence that the stock returns drive the DJ-UBS sentiment and that the commodity returns drive the S&P 500 sentiment. Both coefficients have a high magnitude and a negative algebraic sign. Therefore it is to assume that news article writers base their information on the returns of the previous days. Accordingly the behavior of the analysts changed for the subsequent contraction period. In times of fluctuating stock returns they are looking for profound information. As a consequence the results show only significant coefficients for an impact on sentiments for the first lag of the DJ-UBSTR return. The findings illustrate that during contracting markets the news article-writing analysts base their trust on commodity returns rather than on stock returns, assuming that the commodity market leads the stock market on day-to-day basis. However the results are critically affected by the composition of the VAR model. The effects may completely change to minor modifications. Correcting the impact of the returns for the changes in the trading volumes of the S&P 500 results in a leading role of the stock market. Contrary to the previous findings the stock returns lead the commodity sentiments during the contraction period. Completely different results have been provided when using the VARX model. However the results need to be interpreted with care when treating the sentiments as exogenous variables because of the conceivable endogeneity bias.

Further, the data gives evidence for information spillovers from news sentiments. It is to assume that the news article-writing analysts are influenced by the news sentiments of the previous day. Positive lag coefficients indicate a momentum in sentiment scores within and across markets. The sentiments of both markets are influenced by their own sentiment and the sentiment of the other market from the previous day. In contrast the results for the spillovers from sentiments on returns were disappointing. Further still, the magnitudes are too small for

any economic use. In terms of the Granger Causality this would indicate that there is no lead of the sentiments on the returns. Secondly high p – values denote that the coefficients occurred by chance. Only for the impact of the commodity sentiments on the stock returns there is sporadic evidence. Independent of the choice of the business cycle the relation is negative for significant coefficients. Even still the magnitudes are too small for any economic use. The results of the analysis on information spillovers from sentiments to returns coincide with the findings of J. P. Morgan (2011). They have observed that the impact of news on the stock performance is fairly limited. Their conclusion is based on the assumption that the prices tend to anticipate future news flows. As a consequence the prices rise previously to good news and decrease to previously bad news within a market. This effect could explain the little stock price reaction that is observed after news events.

Links across markets could potentially appear not only in returns and sentiment scores but also in return and sentiment score volatilities. Due to the fact that the findings for spillover effects from sentiments to returns were moderate, the next step was to explore if there were at least any volatility spillovers from sentiments to returns. The findings give evidence for various spillover effects during the expansion period. The volatilities of the S&P 500 and the DJUBS sentiments both have a significant impact on the volatility of the returns in the commodity market Whereas the impact from the stock market is positive and significant for a one-day lag the impact of the commodity market is negative for lag one and positive for lag two and three. The coefficients indicate that high absolute sentiment scores in the stock market are expected to have an increasing influence on the commodity returns and a decreasing influence on the stock returns of the following day. Surprisingly enough the volatility of the stock market sentiment has no significant influence on the volatility of the stock returns. During the contraction period the sentiment volatility spillovers need more time to incorporate into prices. But still there are significant positive volatility spillovers across the markets. Overall, the model for the lead-lag relation in volatilities finds significance for a link between the sentiments and the returns. But there is no consistent direction of the volatility spillovers. Additionally the magnitudes of the coefficients are again very small.

Based on the analysis results presented herein one cannot conclude whether one market primarily leads the other. The cross relations over various interdependences made it difficult to define clear lead-lag relations between the commodity and the stock market. Closing it is to

note that there are various linkages between the two markets and that portfolio manager would be well advised to give attention to it.