Executive Summary

Problem and objective

Correlations between asset returns are rising in times of turbulences in the market. Several former studies have shown that correlations are much greater in downside than in upside moves of the stock market. On the other hand, it has been shown in earlier literature that public news has an important influence on stock prices. Concretely, positive news sentiment leads to higher stock returns and the other way round. Similar findings were also reported for individual commodity futures but there has been no study on the role of news in determining correlations between different commodities. The research questions for this thesis are thus twofold. First of all, can similar behaviour in the commodity market like in the stock market be observed, meaning that in times of turbulences or in recessions correlations between commodity returns rise? Secondly, does news sentiment play a role in the dynamics of cross-commodity correlations?

Furthermore, the reasons for rising correlations in downturns are not quite clear. One possible explanation is that in times of turbulences investors try to get rid of their positions as fast as possible in fear of big losses in their portfolio. They do not think rationally anymore and sell both fundamentally good and bad assets. An additional question is therefore, what the trigger of this mass selling of assets is and if news flow has a direct influence on this process.

Method

News sentiments are taken from the Thomson Reuters News Analytics Archive provided by the Department of Banking and Finance of the University of Zurich. With the help of an algorithmic text-reading tool news are classified as positive or negative whereby news sentiment scores are built. The database contains data of different commodities from 2003 on. A sample of 23 different sentiments, 40 future contracts and 6 commodity subindices are considered for the tests. These news sentiment scores are then used to analyse if there is an influence on cross-commodity correlations and the mass selling effect. Returns and correlations are calculated based on historical commodity futures prices from Bloomberg. To analyse the buying and selling behaviour of investors, aggregated futures volume and aggregated futures open interest of commodity futures also provided by Bloomberg are used. The investigations are done by performing test like the exceedance correlation by **?**, lead-lag analyses and multiple linear regressions.

Results

The analyses show that the effect of rising correlations in times of market turbulences not only happens in the equity market but also in the commodity market. The results of the exceedance correlation demonstrate that correlations between commodity futures within a category and their corresponding subindices do not

only rise in times of falling returns but also with increasing prises, almost without exceptions. Considering that many commodities within a category are substitutes for each other, this result sound reasonable. The fact that if there is a drought destroying 30% of the corn harvest and seriously damaging other crops too, not only drives up prices for corn but forces people to buy substitutes like wheat and soybeans. Higher demand increases the prices of substitutes too and automatically leads to higher correlations in a sector. Interestingly, doing the exceedance correlation analysis among the subindices of the categories, the effect of higher correlations with extreme returns is unusual and does hardly appear. However, in contrast to the single future analysis, there is evidence for asymmetric correlation for at least some of the subindices. In other words, correlations are rising more for negative than for positive returns. This could be a result of the financialization of the commodity markets which has arised by diversifying portfolios through passive investment products like exchange traded commodity funds. Selling these products in times of a crisis and higher liquidity needs can lead to rising correlation among commodity categories.

A lead-lag analysis of the impact of news sentiment on future and subindex returns leads to the conclusion that prices are indeed very sensitive to news. This is especially true for energies, grains and oilseeds and soft commodities like cocoa and coffee which are all very important in our daily life. Thus, a message of falling reserves of crude oil makes investors more nervous than a riot in the country that produces a big share of the world's platinum demand. The fact that returns only react sharply on the day the news is made public is an indicator that the speed of incorporation of news in commodity prices is high and therefore markets are very efficient.

Non-cumulated news sentiment does not influence correlations at all, neither for futures within a category nor for subindices. This seems somehow reasonable as correlation first of all is not calculated for returns of one day only but over a certain period. Moreover, as former research has proposed, news sentiment initially has an impact on trading activity and return. The influence on correlation follows later when sentiment is repeatedly positive or negative and investors start herding. Thus it is little surprising that cumulating news sentiment over 10 days improves the results a lot and an influence on correlation becomes visible. However, cumulated news sentiment is not the only factor that affects correlation as the multiple regression analysis has shown. Factors which influence both correlations between futures and their associated subindices and correlations among subindices much more are the turnover ratio and especially volatility which is at the same time a result from higher returns.

Conspicuous is the special status of precious metals, in particular gold. Correlation of gold to its subindex does not show any reaction to positive or negative news sentiment. This can be interpreted as that investors do not buy gold due to positive or negative news but for other reasons. One reason could be the treatment of gold as a refuge asset in times of turbulences in the markets. Falling correlations between the precious metal subindex and most of the other subindices if volatility

is high emphasizes this status.

Finally, the mass selling effect only, if at all, seems to be indirectly influenced by news sentiment. Large amount of news during the day and consequently triggered trading activity does not exhibit larger volume for negative news sentiment days. Rather, positive and negative returns which may be resulting from positive and negative news sentiment cause volumes to react significantly. Moreover, the traded volume is mostly higher for negative returns. Concluding, news sentiment alone does not lead investor to herd and can therefore not explain the mass selling effect, it is more likely negative returns that have a decisive influence.