Peter Štefko – Dissertation

Essays on Information in Financial Markets

Abstract

The first chapter of this dissertation carries out a multidimensional investigation of weak-form market efficiency for the stock market indices of the United States, Germany, and five CEE countries during the years following the 2008 Global Financial Crisis. We analyze developments over time in the predictable power and potential profitability of three classes of well known technical trading rules applied to market index prices, sampled at three different frequencies: daily, hourly, and 15-minute. We approach our analysis by testing for true abnormal performance of trading rules using White's Reality Check procedure as well as by evaluating a simple out of sample investment strategy based on ex-post best performing trading rules. We find that, while the developed stock markets of the US and Germany exhibit results strongly consistent with market efficiency at all three sampling frequencies, some evidence of predictable power of technical analysis (consistent with the concept of adaptive efficiency introduced by Lo (2005)) is present for the stock markets of Austria, the Czech Republic, Hungary, Poland, and Slovenia at the two intraday sampling frequencies. However, the results are challenged when we take transaction costs into account. Our proposed comparison of developed and emerging stock markets provides new insights regarding the degree of market efficiency, especially for intraday data and for countries that have experienced a transition to a market economy relatively recently.

The second chapter utilizes trade-level data on WTI crude oil futures contracts during the period 2017 - 2019 to assess the dynamics of market microstructure order flow toxicity around the weekly regular US crude oil inventory levels announcements. We estimate order flow toxicity using the Volume-synchronized Probability of Informed Trading (VPIN) metric devised by Easley, de Prado and O´Hara (2012) and we investigate announcements by two different publishers. We find that this probability metric increases on average by 20% immediately (within seconds) after data publication and the magnitude of this change is positively associated with the degree to which the particular announcement can be regarded as surprising. Moreover, for the report published by the US Department of Energy, we observe 20% smaller average values of daily VPIN profile during the 30 minutes leading up to the publication time, as opposed to the same time of day on non-announcement days.

The third chapter investigates risk contagion dynamics within a set of the four most liquid Eurozone sovereign government bond futures (France, Germany, Italy, and Spain) during the period 2016 - 2020, applying the Diebold and Yilmaz (2014) connectedness framework. We find that the overall system-wide connectedness, as measured by the Total Spillover Index, varies between 30 and 72 percent, representing a moderately interconnected system when compared to

other benchmark studies. The connectedness exhibits the tendency to rise sharply following geopolitical or macroeconomic shocks, represented in our sample mainly by the Italian political crisis of 2018 and the Covid-19 outbreak of 2020. Italian government bond futures are the principal spillovers transmitter vis-à-vis the rest of the system, despite the fact that the Italian bond market accounts for a proportionately smaller fraction of the system's aggregate traded volume. While the volatility transmitting role of Italy is predominantly associated with its internal turbulent political development, Germany takes the leading role as the sample's volatility transmitter of major global affairs. We additionally find evidence of a significant association between the degree of a country's directional spillovers transmission and its underlying macroeconomic fundamentals, particularly the changes in the country's debt-to-GDP ratio.