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Incremental information of stock indicators

Dimitrios I. Vortelinos *

Lincoln Business School, University of Lincoln, LN6 7TS, UK

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ABSTRACT

The present paper is the first to examine the incremental information of stock indicators in the spot and futures stock markets. The properties of volatility series of indicators in relation to spot and futures stock indices are examined. Correlations between either the spot or futures stock indices and the corresponding indicators are examined for their properties. The asymmetry, heterogeneity and jump properties of volatilities and correlations are studied. Indicators offer information not captured in the corresponding futures and spot stock indices. Volatility and correlation in the stock market are accurately in-sample predicted via asymmetric and HAR models. The inclusion of indicators improves the in-sample modeling of volatility and correlation in the stock market.

1. Introduction

Financial indicators are useful for explaining the behavior of financial markets. In many times, they work as sentiment measures. These indicators can be thought of as the underlying market itself. The finance literature has not either analyzed or utilized these financial indicators. When, at the same time, they are very popular among professionals. This paper is one among very few papers to analyze the properties of seven major indicators of the US stock market. Their properties are compared to their underlying markets. As underlying markets, nine spot stock indices and five e-mini futures stock indices are used. The main research question of the paper is the incremental information of indicators, as depicted in the underlying spot and (e-mini) futures indices.

Incremental information of indicators is examined on: (a) distributional properties of returns, volatilities and correlations across indicators, spot stock indices and futures stock indices, (b) Granger-causality asymmetries on correlations between indicators and underlying (spot and futures) indices, and (c) the explanatory power of heterogeneity- and jumps-properties of indicators' volatility in correlations via a heterogeneity- and jumps-model (HAR-RV-J); and (d) the explanatory power of the continuous- and jumps-components of indicators' volatility in correlations via a continuous- and jumps-components model (HAR-RV-CJ).

Volatility is estimated using the realized (Parkinson) range estimator as in Martens and van Dijk (2007) and Todorova and Soucek (2014). Correlation series are estimated via the realized (Parkinson) range correlation estimator, as settled in Martens and van Dijk (2007). Jumps in volatility and correlation series are detected via the jump detection scheme introduced in Huang and Tauchen (2005) and finalized in Andersen, Bollerslev, and Diebold (2007).

In this paper, the distributional properties of returns, volatilities and correlations across indicators, spot stock indices and futures stock indices are examined via (a) the magnitude of the average-, standard deviation-, skewness- and kurtosis-values; (b) the CVM normality test; (c) the Ljung–Box serial correlation test in levels and squared series; and (d) comparisons of distributional properties (Kolmogorov–Smirnov test).

* Tel.: +44 1522835634.
E-mail address: dvortelinos@lincoln.ac.uk.

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Table 1
Realized ranges — Kolmogorov–Smirnov test.

	TRIN	TICK	TIKI	ADV	DECL	UVOL	DVOL
Panel A. Spot stock indices — indicators							
INDU	0.999*	1.000*	1.000*	0.403*	0.999*	0.998*	1.000*
p-Values	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16
NDX	0.992*	0.996*	1.000*	0.706*	1.000*	0.996*	1.000*
p-Values	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16
INX	0.992*	0.996*	1.000*	0.420*	0.996*	0.996*	1.000*
p-Values	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16
COMPX	0.991*	0.996*	1.000*	0.542*	1.000*	0.996*	1.000*
p-Values	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16
RUT	0.990*	0.996*	1.000*	0.561*	1.000*	0.995*	1.000*
p-Values	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16
OEX	0.991*	0.996*	1.000*	0.418*	0.996*	0.996*	1.000*
p-Values	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16
IDX	0.993*	0.997*	1.000*	0.477*	1.000*	0.996*	1.000*
p-Values	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16
RUI	0.992*	0.995*	0.999*	0.403*	0.998*	0.997*	0.999*
p-Values	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16
RUA	0.991*	0.996*	0.998*	0.404*	1.000*	0.995*	0.998*
p-Values	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16
Panel B. Futures stock indices — indicators							
ES	0.991*	0.995*	0.998*	0.479*	0.993*	0.995*	0.998*
p-Values	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16
NQ	0.991*	0.995*	0.999*	0.653*	0.992*	0.996*	0.999*
p-Values	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16
YM	0992*	0.996*	0.999*	0.444*	0.993*	0.996*	0.998*
p-Values	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16
TF	0.991*	0.996*	0.999*	0.720*	0.998*	0.996*	0.999*
p-Values	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16
EMD	0.992*	0.996*	1.000*	0.555*	1.000*	0.996*	1.000*
p-Values	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16	<2.2e-16

Notes. Table 1. H0: the two estimators come from the same distribution. There are both statistic- and p-values of the Kolmogorov–Smirnov test. The distributional properties of realized range of spot stock indices compared to realized range of the corresponding stock indicators (panel A), and also compare the properties of realized range of futures stock indices to realized range of the corresponding stock indicators (panel B). * reveals significance in the 5% significance level.

Amira, Taamouti, and Tsafack (2011) analyzed the Granger-causality asymmetries on correlations are analyzed regarding returns- and volatilities-news. A recent study on asymmetries is Soucek and Todorova (2014). The present paper examines Granger-causality asymmetries on correlations between indicators and underlying (spot and futures) indices. The scope of asymmetric regressions is to detect, apart from asymmetries, the existence of incremental information from indicators.

The role of jumps in realized volatility was recently researched in Soucek and Todorova (2014). The benefit of modeling jumps in realized volatility is deployed in Liao (2013). A recent study utilizing the benefits of HAR modeling is Sevi (2013). Atak and Kapetanios (2013) compare the out-of-sample performance of HAR to factor models. In the present paper, the explanatory power of heterogeneity- and jumps-properties of indicators' volatility in correlations via a heterogeneity- and jumps-model (HAR-RV-J). The explanatory power of the continuous- and jumps-components of indicators' volatility in correlations via a continuous- and jumps-components model (HAR-RV-CJ).

The rest of the paper is organized as follows. Section 2 describes the data. Section 3 presents the realized volatility (correlation) estimation & jumps detection. Section 4 presents a preliminary analysis of volatilities and correlations. Section 5 studies asymmetries. Section 6 examines heterogeneity and jumps. Section 7 summarizes the results.

2. Data

The present paper uses 5-min data, which are sampled further from 1-min data. The dataset includes seven stock indicators, ten underlying stock spot indices, and five underlying stock futures indices. The indicators[1] used are: (i) NYSE Short Term Trade Index (symbol: TRIN), (ii) NYSE Issues Up/Down Ratio (TICK), (iii) DJIA Issues Up/Down Ratio (TIKI), (iv) NYSE Advancing Issues (ADV), (v) NYSE Declining Issues (DECL), (vi) NYSE Up Volume (UVOL), and (vii) NYSE Decline Volume (DVOL). The underlying stock spot indices are: (i) Dow Jones Industrial Average (INDU), (ii) Nasdaq 100 Index (NDX), (iii) S&P 500 Index (INX), (iv) Nasdaq Composite Index (COMPX), (v) Russell 2000 Index (RUT), (vi) S&P 100 Index (OEX), (vii) S&P 400 Midcap Index (IDX), (viii) Russell 1000 Index (RUI), and (ix) Russell 3000 Index (RUA). The underlying stock futures indices are: (i) E-Mini S&P 500 Continuous Contract (ES), (ii) E-Mini Nasdaq 100 Continuous Contract (NQ), (iii) Mini-sized Dow Futures Continuous Contract (YM), (iv) Mini Russell 2000 Continuous Contract (TF), and (v) E-Mini S&P MidCap 400 Continuous Contract (EMD).

[1] For detailed professional analysis of Intraday indicators, see the Active Trader Magazine and markettells.com.