Exercise 12 - High Frequency Granger Causality Analysis (in R)

Jan 7, 2018

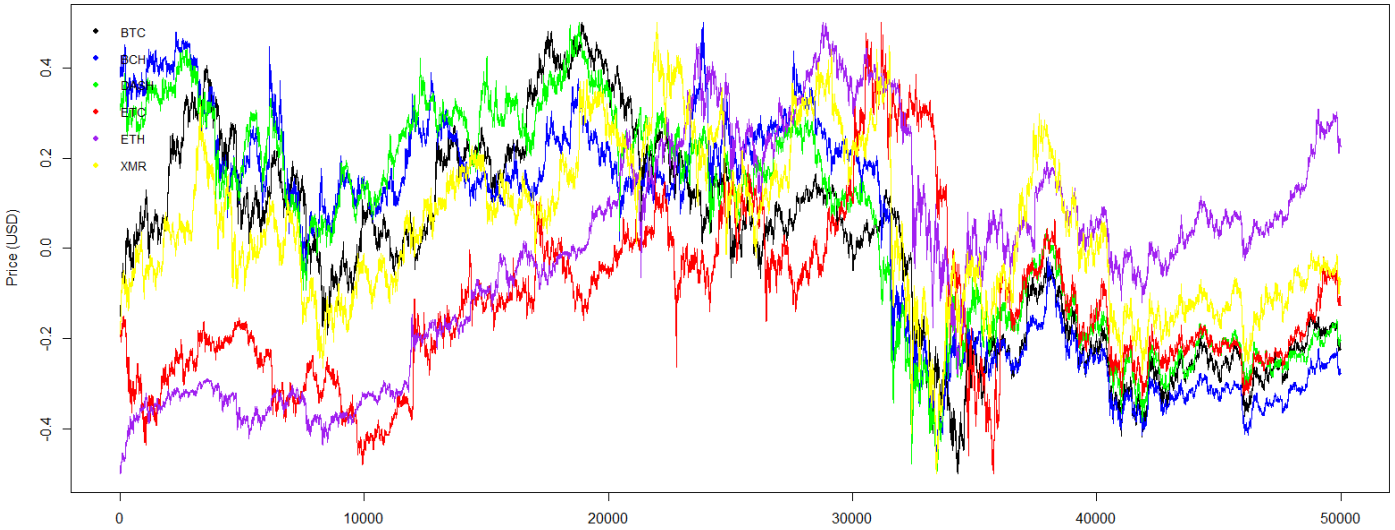

Figure 1 - Normalised cryptocurrency price in USD (30 days)

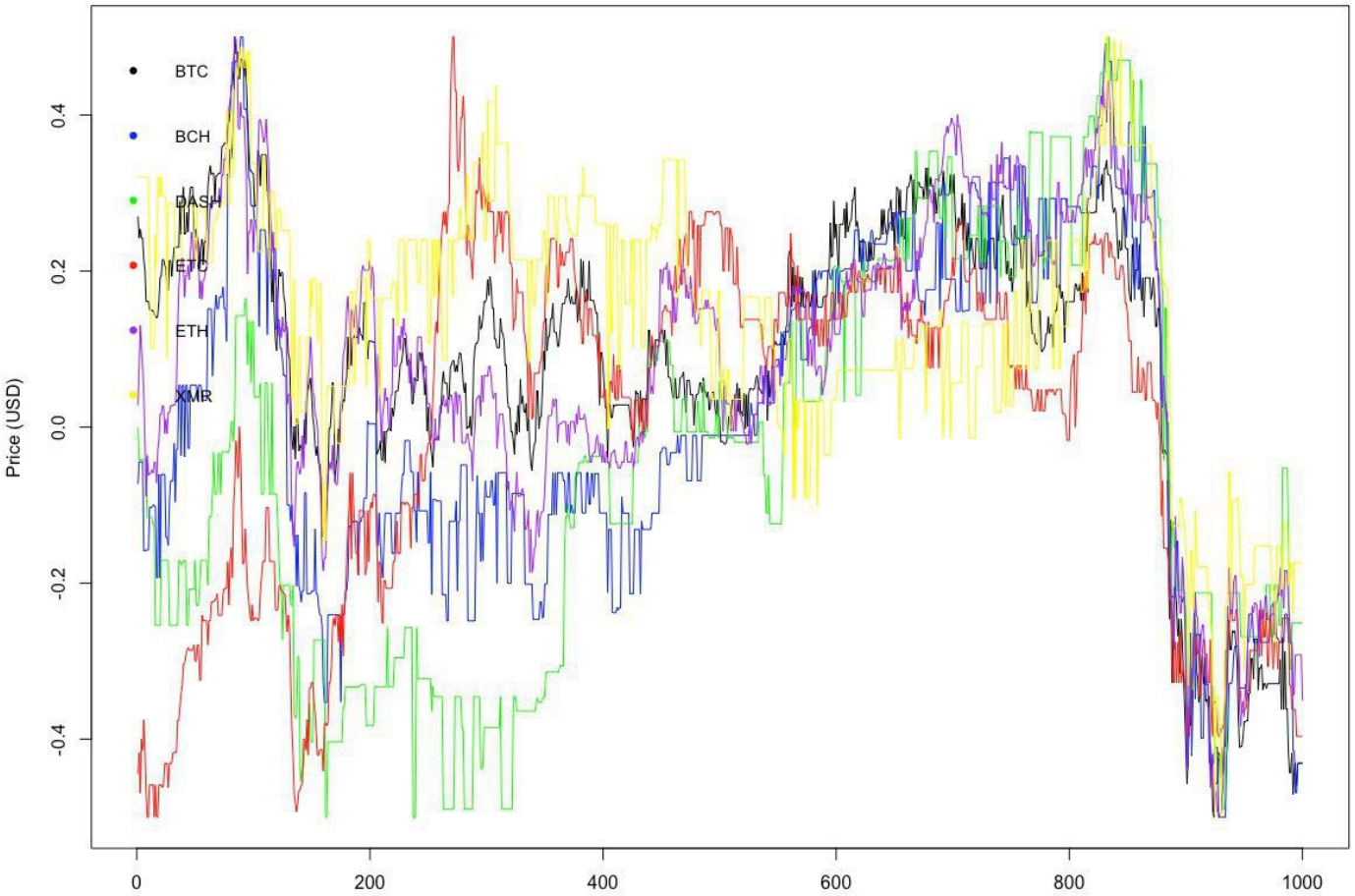

Figure 2 - Normalised cryptocurrency price in USD (16 hours, falling)

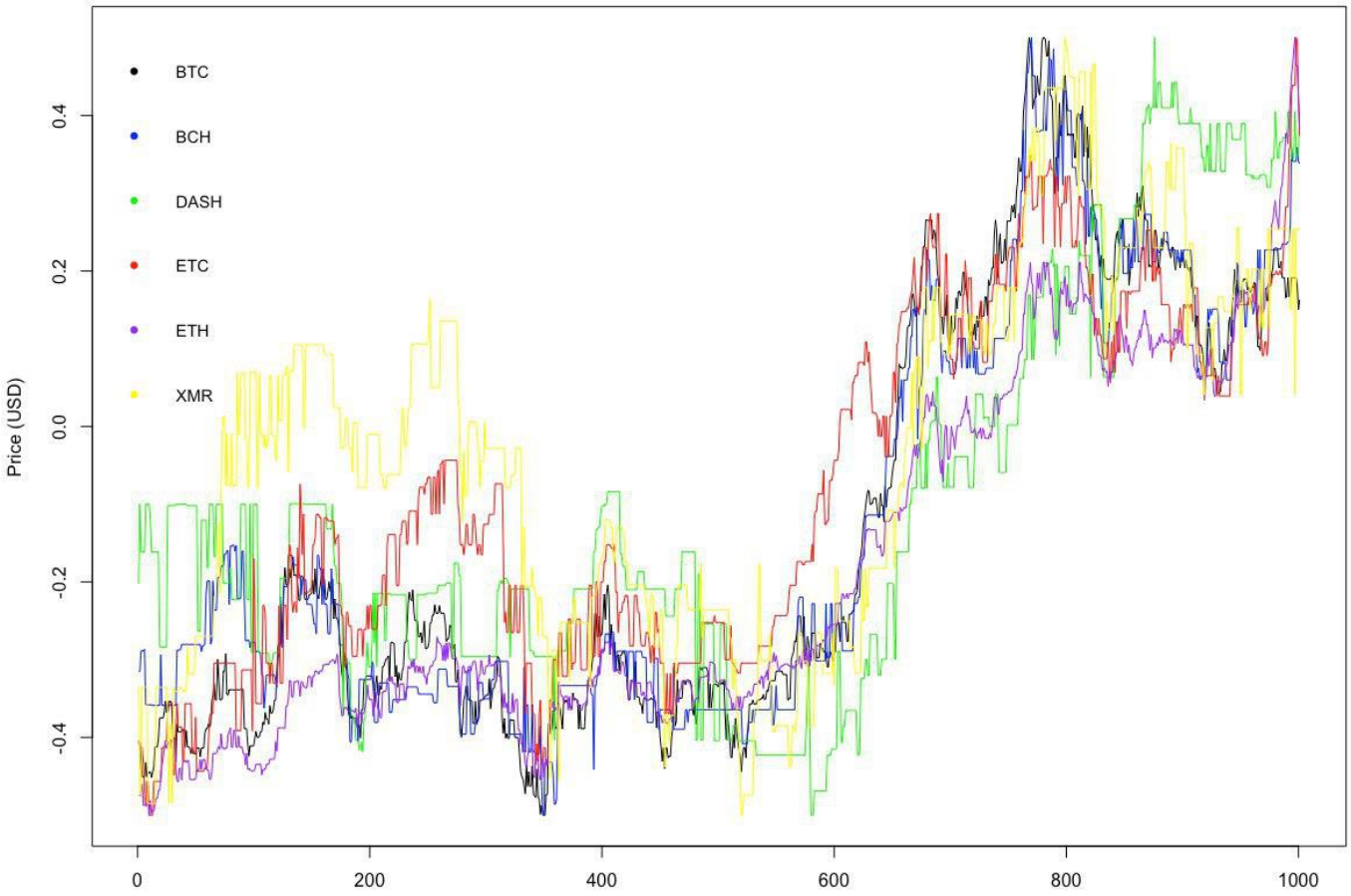

Figure 3 - Normalised cryptocurrency price in USD (16 hours, rising)

Data collected via script: 600MiB, 1000s features (Poloniex)
Data collected via scraping: 1 Year, 7 currencies (CoinMarketCap)

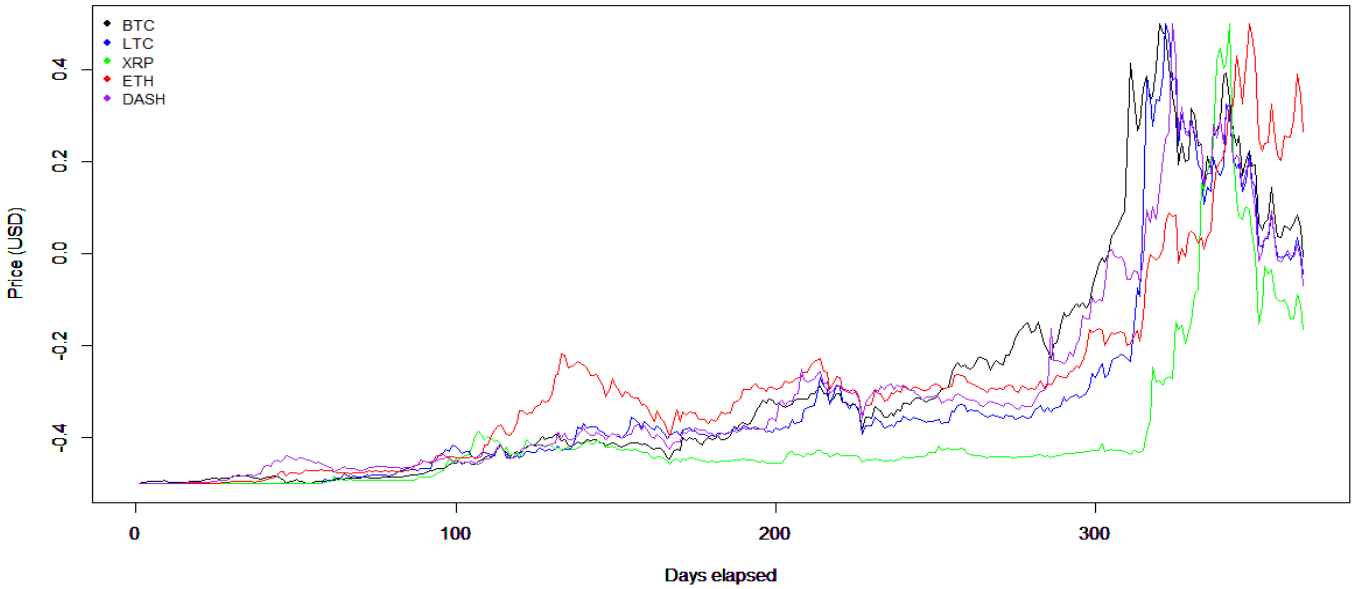

Figure 4 - Normalised cryptocurrency price in USD (365 days)

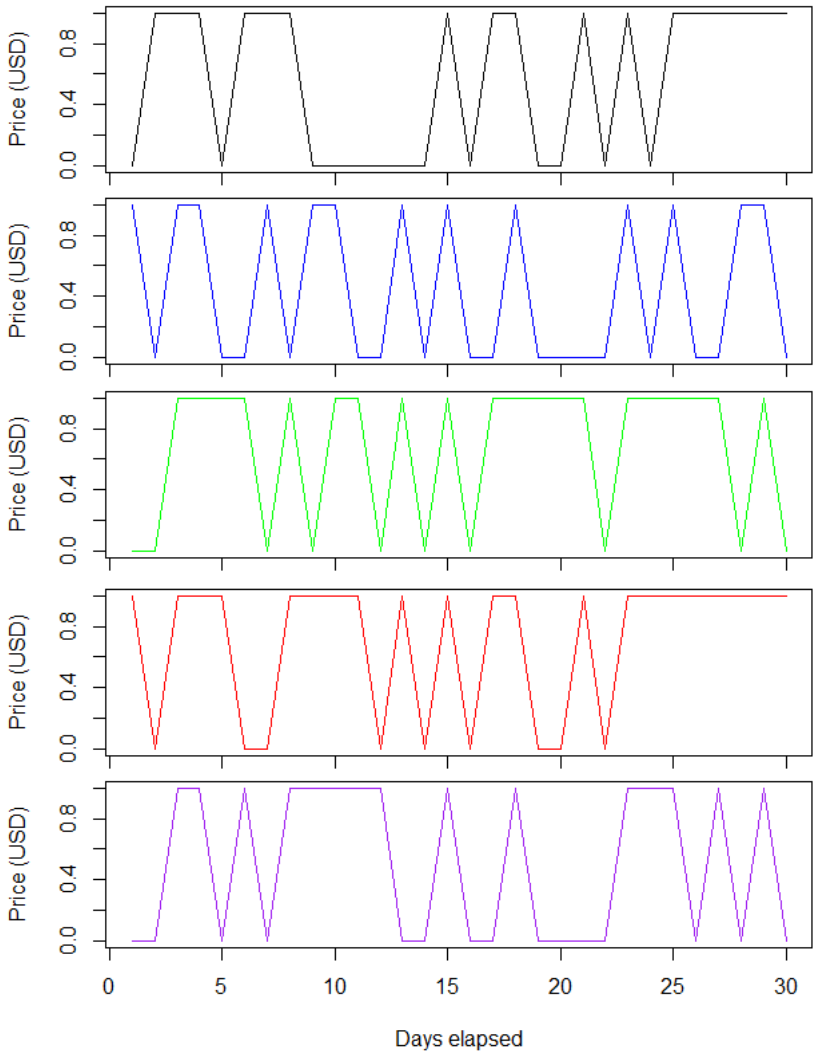

Figure 5 - Cryptocurrency binary price change (last 30 days)

Lag order	1	2	3	4	5	10	20	30	40	70
BTC-ETH	P = 0.0789	P = 1e-06	P = 1e-12	P = 6e-16	P = 0	P = 5e-15	P = 5e-14	P = 1e-13	P = 7e-13	P = 3e-10
ETH-BTC	P = 0.2015	P = 0.0056	P = 0.0067	P = 0.0299	P = 0.0284	P = 0.0793	P = 0.0228	P = 0.0700	P = 0.0358	P = 0.0734
BTC-DASH	P = 0.0026	P = 8e-05	P = 9e-10	P = 4e-10	P = 2e-09	P = 6e-10	P = 8e-10	P = 4e-09	P = 2e-09	P = 3e-06
DASH-BTC	P = 0.9290	P = 0.0518	P = 0.0699	P = 0.0599	P = 0.1073	P = 0.0297	P = 0.2037	P = 0.1404	P = 0.1732	P = 0.1004
BTC-BCH	P = 7e-09	P = 2e-07	P = 1e-08	P = 5e-09	P = 2e-09	P = 3e-11	P = 2e-11	P = 2e-11	P = 2e-10	P = 1e-07
BCH-BTC	P = 0.3137	P = 0.1449	P = 0.2188	P = 0.4062	P = 0.0443	P = 0.0758	P = 0.0889	P = 0.0909	P = 0.1115	P = 0.2353
BCH-DASH	P = 0.0004	P = 0.0033	P = 0.0009	P = 0.0019	P = 0.0037	P = 0.0249	P = 0.0007	P = 0.0042	P = 0.0023	P = 0.0124
DASH-BCH	P = 0.0003	P = 0.0047	P = 0.0191	P = 0.0013	P = 0.0025	P = 0.0063	P =0.0119	P = 0.0042	P = 0.0040	P = 0.1533

Table 1 - High Frequency Granger Causality tests for different lag orders (1000min of **falling** data, as in figure 2)

Lag order	1	2	3	4	5	10	20	30	40	70
BTC-ETH	P = 0.0624	P = 5e-07	P = 8e-09	P = 3e-11	P = 3e-10	P = 1e-09	P = 3e-07	P = 4e-06	P = 0.0004	P = 0.0012
ETH-BTC	P = 0.1992	P = 0.0103	P = 0.0009	P = 0.0022	P = 0.0076	P = 0.0533	P = 0.0571	P = 0.0007	P = 0.0006	P = 0.0005
BTC-DASH	P = 2e-05	P = 7e-05	P = 3e-05	P = 5e-05	P = 3e-06	P = 2e-07	P = 6e-07	P = 2e-05	P = 2e-06	P = 7e-05
DASH-BTC	P = 0.1621	P = 0.1179	P = 0.1805	P = 0.2424	P = 0.2757	0.6121	0.3166	0.1037	0.2511	0.2895
BTC-BCH	P = 9e-16	P = 2e-12	P = 1e-14	P = 9e-15	P = 2e-16	P = 4e-15	P = 2e-13	P = 2e-12	P = 1e-13	P = 1e-10
BCH-BTC	P = 0.3537	P = 0.9893	P = 0.9517	P = 0.9571	P = 0.9232	P = 0.8869	P = 0.9087	P = 0.9092	P = 0.5594	P = 0.5159
BCH-DASH	P = 1e-06	P = 9e-07	P = 1e-06	P = 2e-06	P = 4e-06	P = 3e-06	P = 2e-05	P = 0.0002	P = 7e-05	P = 0.0003
DASH-BCH	P = 0.1900	P = 0.4876	P = 0.3386	P = 0.2298	P = 0.1942	P = 0.2396	P = 0.6518	P = 0.4756	P = 0.2626	P = 0.4014

Table 2 - High Frequency Granger Causality tests for different lag orders (1000min of **rising** data, as in figure 3)