

## SUPPORTING INFORMATION S2: Web search queries can predict stock market volumes.

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### 1 Beyond Granger Tests: Tables

Table S 1. Test 1: p-values for the 26 companies for which  $Q \rightarrow V$  at  $p = 0.01$

| Ticker | $p - val(Q \rightarrow V)$ | $p - val(V \rightarrow Q)$ | CCF  |
|--------|----------------------------|----------------------------|------|
| atvi   | 0.000100                   | 0.995100                   | 0.39 |
| csc    | 0.000100                   | 1.000000                   | 0.74 |
| expe   | 0.000100                   | 0.997100                   | 0.52 |
| ilmn   | 0.000100                   | 0.996800                   | 0.40 |
| isrg   | 0.000100                   | 0.998900                   | 0.67 |
| nflx   | 0.000100                   | 1.000000                   | 0.68 |
| nvda   | 0.000100                   | 1.000000                   | 0.79 |
| rimm   | 0.000100                   | 1.000000                   | 0.66 |
| altr   | 0.000200                   | 0.999900                   | 0.55 |
| msft   | 0.000200                   | 0.961500                   | 0.42 |
| symc   | 0.000200                   | 0.986800                   | 0.58 |
| mrvi   | 0.000500                   | 0.990800                   | 0.40 |
| orcl   | 0.000500                   | 0.966600                   | 0.52 |
| erts   | 0.000800                   | 0.954600                   | 0.62 |
| amgn   | 0.000900                   | 0.949500                   | 0.36 |
| ffiv   | 0.001400                   | 0.793400                   | 0.65 |
| ntap   | 0.001800                   | 0.968100                   | 0.61 |
| bbby   | 0.001900                   | 0.983300                   | 0.43 |
| apol   | 0.002000                   | 0.896500                   | 0.79 |
| amzn   | 0.002100                   | 0.769600                   | 0.48 |
| urbi   | 0.002700                   | 0.880500                   | 0.37 |
| vrtx   | 0.003200                   | 0.973900                   | 0.50 |
| adbe   | 0.004300                   | 0.766700                   | 0.85 |
| qgen   | 0.006000                   | 0.981300                   | 0.35 |
| chrw   | 0.007300                   | 0.965600                   | 0.16 |
| stx    | 0.008600                   | 0.995600                   | 0.37 |

Table S 2. Test 1: p-values for the ten companies with smallest  $p - val(V \rightarrow Q)$

| Ticker | p - val(Q $\rightarrow$ V) | p - val(V $\rightarrow$ Q) |
|--------|----------------------------|----------------------------|
| dltr   | 0.957000                   | 0.019700                   |
| mxim   | 0.963700                   | 0.060700                   |
| ltc    | 0.936800                   | 0.106900                   |
| rost   | 0.851700                   | 0.142600                   |
| cmcsa  | 0.913600                   | 0.175900                   |
| vrsn   | 0.781100                   | 0.176800                   |
| infy   | 0.750700                   | 0.183600                   |
| fir    | 0.836400                   | 0.193800                   |
| vmed   | 0.805600                   | 0.220700                   |
| intu   | 0.821200                   | 0.270100                   |

Table S 3. List of tickers for which Test 2 gives significant results

| Ticker | Outcome           |
|--------|-------------------|
| aapl   | $Q \rightarrow V$ |
| adbe   | $Q \rightarrow V$ |
| adp    | $Q \rightarrow V$ |
| akam   | $Q \rightarrow V$ |
| altr   | $Q \rightarrow V$ |
| amgn   | $Q \rightarrow V$ |
| amzn   | $Q \rightarrow V$ |
| apol   | $Q \rightarrow V$ |
| atvi   | $Q \rightarrow V$ |
| bbby   | $Q \rightarrow V$ |
| bidu   | $Q \rightarrow V$ |
| biib   | $Q \rightarrow V$ |
| brem   | $Q \rightarrow V$ |
| celg   | $Q \rightarrow V$ |
| ceph   | $Q \rightarrow V$ |
| csc    | $Q \rightarrow V$ |
| ctrp   | $Q \rightarrow V$ |
| ctxs   | $Q \rightarrow V$ |
| dltr   | $Q \rightarrow V$ |
| erts   | $Q \rightarrow V$ |
| esrx   | $Q \rightarrow V$ |
| expd   | $Q \rightarrow V$ |
| expe   | $Q \rightarrow V$ |
| ffiv   | $Q \rightarrow V$ |
| fslr   | $Q \rightarrow V$ |
| gild   | $Q \rightarrow V$ |
| grmn   | $Q \rightarrow V$ |
| ilmn   | $Q \rightarrow V$ |
| infy   | $Q \rightarrow V$ |
| intc   | $Q \rightarrow V$ |
| iisrg  | $Q \rightarrow V$ |
| klac   | $Q \rightarrow V$ |
| lrcx   | $Q \rightarrow V$ |
| mchp   | $Q \rightarrow V$ |
| micc   | $Q \rightarrow V$ |
| mrvl   | $Q \rightarrow V$ |
| msft   | $Q \rightarrow V$ |
| nflx   | $Q \rightarrow V$ |
| nihd   | $Q \rightarrow V$ |
| ntap   | $Q \rightarrow V$ |
| nvda   | $Q \rightarrow V$ |
| orcl   | $Q \rightarrow V$ |
| pcar   | $Q \rightarrow V$ |
| pcln   | $Q \rightarrow V$ |
| rimm   | $Q \rightarrow V$ |
| sbux   | $Q \rightarrow V$ |
| shld   | $Q \rightarrow V$ |
| sndk   | $Q \rightarrow V$ |
| srel   | $Q \rightarrow V$ |
| stx    | $Q \rightarrow V$ |
| symc   | $Q \rightarrow V$ |
| urbn   | $Q \rightarrow V$ |
| wcrx   | $Q \rightarrow V$ |
| wfmi   | $Q \rightarrow V$ |
| yhoo   | $Q \rightarrow V$ |

Table S 4. List of tickers for which Test 2 gives significant results

| <b>Ticker</b> | <b>Outcome</b>    |
|---------------|-------------------|
| joyg          | $V \rightarrow Q$ |
| lltc          | $V \rightarrow Q$ |
| rost          | $V \rightarrow Q$ |
| teva          | $V \rightarrow Q$ |
| vrsn          | $V \rightarrow Q$ |
| vrtx          | $V \rightarrow Q$ |

Table S 5. Outcome of Test 3

| Ticker | p - val(Q → V) | p - val(V → Q) | Ticker | p - val(Q → V) | p - val(V → Q) |
|--------|----------------|----------------|--------|----------------|----------------|
| aapl   | 0.000002       | 0.006796       | joyg   | 0.000000       | 0.000000       |
| adbe   | 0.000000       | 0.000000       | klac   | 0.000000       | 0.000000       |
| adp    | 0.000000       | 0.000237       | linta  | 0.030768       | 0.000000       |
| adsk   | 0.000000       | 0.000000       | lltc   | 0.000000       | 0.000000       |
| akam   | 0.000000       | 0.000000       | lrcx   | 0.000000       | 0.000000       |
| altr   | 0.000000       | 0.000000       | mat    | 0.000000       | 0.000970       |
| amat   | 0.000000       | 0.000151       | mchp   | 0.000000       | 0.000000       |
| amgn   | 0.000000       | 0.000545       | micc   | 0.000000       | 0.000000       |
| amzn   | 0.000000       | 0.000000       | mrvl   | 0.000000       | 0.000000       |
| apol   | 0.000000       | 0.000000       | msft   | 0.000000       | 0.005801       |
| atvi   | 0.000000       | 0.000125       | mu     | 0.000002       | 0.048229       |
| bbby   | 0.000000       | 0.000061       | mxim   | 0.000000       | 0.000000       |
| bidu   | 0.000000       | 0.000000       | myl    | 0.000000       | 0.000000       |
| biib   | 0.000000       | 0.000229       | nflx   | 0.000000       | 0.000003       |
| bmc    | 0.000000       | 0.000000       | nihd   | 0.000000       | 0.000000       |
| brcm   | 0.000000       | 0.000000       | ntap   | 0.000000       | 0.000004       |
| celg   | 0.000575       | 0.006149       | nvda   | 0.000000       | 0.000001       |
| ceph   | 0.000000       | 0.000000       | nwsa   | 0.000000       | 0.000000       |
| chkp   | 0.033902       | 0.000000       | orcl   | 0.000000       | 0.000000       |
| chrw   | 0.000000       | 0.000000       | payx   | 0.000027       | 0.000000       |
| cmcsa  | 0.000000       | 0.000000       | pcar   | 0.000000       | 0.000000       |
| csc    | 0.000000       | 0.000000       | pcln   | 0.000000       | 0.000000       |
| ctrp   | 0.000000       | 0.000000       | qcom   | 0.000000       | 0.000000       |
| ctsh   | 0.000000       | 0.000005       | qgen   | 0.000000       | 0.000000       |
| ctxs   | 0.000000       | 0.004119       | rimm   | 0.000000       | 0.000000       |
| dltr   | 0.000000       | 0.000000       | rost   | 0.000000       | 0.000000       |
| dtv    | 0.000001       | 0.000001       | sbux   | 0.000000       | 0.000044       |
| erts   | 0.000000       | 0.000000       | shld   | 0.000000       | 0.000000       |
| esrx   | 0.000000       | 0.000000       | sial   | 0.000080       | 0.024980       |
| expd   | 0.000000       | 0.000000       | sndk   | 0.000000       | 0.000000       |
| expe   | 0.000000       | 0.000449       | spls   | 0.000006       | 0.000000       |
| ffiv   | 0.000000       | 0.000000       | srcl   | 0.000000       | 0.000000       |
| fisv   | 0.054118       | 0.000000       | stx    | 0.000000       | 0.000000       |
| flir   | 0.000005       | 0.000000       | symc   | 0.000000       | 0.000001       |
| fslr   | 0.000000       | 0.000000       | teva   | 0.000000       | 0.000567       |
| gild   | 0.000000       | 0.000000       | urbn   | 0.000000       | 0.000000       |
| goog   | 0.000000       | 0.155566       | vmed   | 0.000003       | 0.000000       |
| grmn   | 0.000000       | 0.000000       | vod    | 0.000000       | 0.004847       |
| hsic   | 0.000000       | 0.000000       | vrsn   | 0.000000       | 0.000000       |
| ilmn   | 0.000000       | 0.001255       | vrtx   | 0.000000       | 0.057984       |
| infy   | 0.000000       | 0.000000       | wcrx   | 0.000000       | 0.000000       |
| intc   | 0.000000       | 0.000000       | wfmi   | 0.000000       | 0.000000       |
| intu   | 0.000000       | 0.000000       | yhoo   | 0.000000       | 0.000000       |
| isrg   | 0.000000       | 0.026642       |        |                |                |