

variance

Theoretical price of stock			
<i>Trading day</i>	<i>Stock-i</i>		
	Company 1	Company 2	Company 3
1	100	200	1000
2	110	210	1050
3	121	205	1080
4	95	150	1020
5	98	210	950

one-day return

Company 1

Company 2

Company 3

0.09531018	0.048790164	0.048790164	0.010072
0.09531018	-0.024097552	0.028170877	0.010072
-0.241913654	-0.312374685	-0.057158414	0.056104
0.031090587	0.336472237	-0.071095922	0.001306
-0.005050677	0.012197541	-0.012823324	0.025852
-0.005050677	0.012197541	-0.012823324	0.025852

variance

two days return

Company 1 Company 2 Company 3

0.001339	0.003796					
0.001317	0.001681	0.19062036	0.02469261	0.076961041	0.06062548	0.014541
0.105347	0.001966	-0.1466035	-0.33647224	-0.028987537	0.008281257	0.057878
0.105154	0.003396	-0.2108231	0.02409755	-0.128254336	0.024093561	0.014398
0.071053	0.003613	-0.0556021	-0.09589402	-0.026760277	0.046500149	0.043408
0.071053	0.003613				0.046500149	0.043408

0.010758

4.96E-06

0.010301

0.010532

0.010532

Compa ny	Year							
	2014				2015			
	I.	II.	III.	IV.	I.	II.	III.	IV.
A	1010	1055	1100	1031	988	1065	918	1060
B	2650	3000	3848	3228	3638	4205	3979	4731
C	1505	2030	2190	2325	2250	2443	1700	1796
D	178	300	325	396	351	370	335	327
E	281	372	358	494	460	539	443	468
F	2645	3125	3400	3330	3400	3425	3475	4100
G	547	800	803	1070	975	952	997	944

Covariance Matrix

A
B
C
D
E
F
G

sigma

sigma Correl Matrix

0.098067 A
0.146364 B
0.198645 C
0.220938 D
0.190778 E
0.077418 F
0.181996 G

Correl M - by using fce

A
B
C
D
E
F
G

A
B
C
D
E
F
G

Q-returns

							E(ri)
0.04359	0.041769	-0.06478	-0.0426	0.075047	-0.14853	0.143827	0.006903
0.124053	0.248941	-0.17569	0.119571	0.14484	-0.05524	0.173106	0.082797
0.299243	0.075866	0.059818	-0.03279	0.082297	-0.3626	0.054934	0.025253
0.521999	0.080043	0.197589	-0.12063	0.052717	-0.09937	-0.02417	0.086882
0.280539	-0.03836	0.322003	-0.07131	0.158489	-0.19615	0.054899	0.072873
0.166763	0.084341	-0.0208	0.020803	0.007326	0.014493	0.165392	0.062617
0.380163	0.003743	0.287059	-0.09298	-0.02387	0.046186	-0.05462	0.077954

A	B	C	D	E	F	G	
0.009617	0.010344	0.013408	0.004913	0.006368	0.005069	-0.00303	A
0.010344	0.021422	0.0114	-0.00098	-0.00646	0.006738	-0.01235	A
0.013408	0.0114	0.03946	0.033623	0.02949	0.007957	0.016462	B
0.004913	-0.00098	0.033623	0.048813	0.032966	0.007341	0.03579	c
0.006368	-0.00646	0.02949	0.032966	0.036396	0.001804	0.024994	d
0.005069	0.006738	0.007957	0.007341	0.001804	0.005994	0.002183	e
-0.00303	-0.01235	0.016462	0.03579	0.024994	0.002183	0.033122	f

0.098067	0.146364	0.198645	0.220938	0.190778	0.077418	0.181996	g
0.098067	0.146364	0.198645	0.220938	0.190778	0.077418	0.181996	B
A	B	C	D	E	F	G	A
1	0.720674	0.688288	0.226756	0.340369	0.667638	-0.16979	B
0.720674	1	0.392109	-0.03026	-0.23152	0.594603	-0.46366	c
0.688288	0.392109	1	0.766101	0.778153	0.517375	0.455353	d
0.226756	-0.03026	0.766101	1	0.782114	0.429199	0.890092	e
0.340369	-0.23152	0.778153	0.782114	1	0.122128	0.719859	f
0.667638	0.594603	0.517375	0.429199	0.122128	1	0.154941	g
-0.16979	-0.46366	0.455353	0.890092	0.719859	0.154941	1	C

0.098067	0.146364	0.198645	0.220938	0.190778	0.077418	0.181996	A
0.098067	0.146364	0.198645	0.220938	0.190778	0.077418	0.181996	B
A	B	C	D	E	F	G	c
1	0.720674	0.688288	0.226756	0.340369	0.667638	-0.16979	d
0.720674	1	0.392109	-0.03026	-0.23152	0.594603	-0.46366	e
0.688288	0.392109	1	0.766101	0.778153	0.517375	0.455353	f
0.226756	-0.03026	0.766101	1	0.782114	0.429199	0.890092	g
0.340369	-0.23152	0.778153	0.782114	1	0.122128	0.719859	
0.667638	0.594603	0.517375	0.429199	0.122128	1	0.154941	
-0.16979	-0.46366	0.455353	0.890092	0.719859	0.154941	1	

Two-years return

0.048319

0.579577

0.176769

0.608177

0.510114

0.438316

0.545677

Variance							fce	
0.001346	0.001216	0.005139	0.002451	0.004644	0.02416	0.018748	0.009617	0.009617
0.001702	0.027604	0.066816	0.001352	0.003849	0.019055	0.008156	0.021422	0.021422
0.075071	0.002562	0.001195	0.003369	0.003254	0.150429	0.000881	0.03946	0.03946
0.189326	4.68E-05	0.012256	0.043061	0.001167	0.034691	0.012333	0.048813	0.048813
0.043125	0.012373	0.062065	0.020789	0.00733	0.072371	0.000323	0.036396	0.036396
0.010847	0.000472	0.006959	0.001748	0.003057	0.002316	0.010563	0.005994	0.005994
0.09133	0.005507	0.043725	0.029217	0.010369	0.001009	0.017577	0.033122	0.033122

Covariance						
0.036688	0.034867	-0.07168	-0.0495	0.068145	-0.15544	0.136924
0.041256	0.166145	-0.25849	0.036775	0.062044	-0.13804	0.090309
0.27399	0.050613	0.034566	-0.05804	0.057044	-0.38785	0.029681
0.435117	-0.00684	0.110707	-0.20751	-0.03417	-0.18625	-0.11105
0.207666	-0.11123	0.249129	-0.14418	0.085616	-0.26902	-0.01797
0.104147	0.021725	-0.08342	-0.04181	-0.05529	-0.04812	0.102776
0.302209	-0.07421	0.209105	-0.17093	-0.10183	-0.03177	-0.13258

							covar_i
0.001346	0.001216	0.005139	0.002451	0.004644	0.02416	0.018748	0.009617
0.001514	0.005793	0.018529	-0.00182	0.004228	0.021456	0.012366	0.010344
0.010052	0.001765	-0.00248	0.002873	0.003887	0.060286	0.004064	0.013408
0.015963	-0.00024	-0.00794	0.010273	-0.00233	0.028951	-0.01521	0.004913
0.007619	-0.00388	-0.01786	0.007138	0.005834	0.041815	-0.00246	0.006368
0.003821	0.000757	0.00598	0.00207	-0.00377	0.00748	0.014073	0.005069
0.011087	-0.00259	-0.01499	0.008462	-0.00694	0.004938	-0.01815	-0.00303
0.001514	0.005793	0.018529	-0.00182	0.004228	0.021456	0.012366	0.010344
0.001702	0.027604	0.066816	0.001352	0.003849	0.019055	0.008156	0.021422
0.011304	0.008409	-0.00893	-0.00213	0.003539	0.053539	0.00268	0.0114
0.017951	-0.00114	-0.02862	-0.00763	-0.00212	0.025711	-0.01003	-0.00098
0.008567	-0.01848	-0.0644	-0.0053	0.005312	0.037136	-0.00162	-0.00646
0.004297	0.003609	0.021563	-0.00154	-0.00343	0.006643	0.009282	0.006738
0.012468	-0.01233	-0.05405	-0.00629	-0.00632	0.004385	-0.01197	-0.01235
0.010052	0.001765	-0.00248	0.002873	0.003887	0.060286	0.004064	0.013408
0.011304	0.008409	-0.00893	-0.00213	0.003539	0.053539	0.00268	0.0114
0.075071	0.002562	0.001195	0.003369	0.003254	0.150429	0.000881	0.03946
0.119218	-0.00035	0.003827	0.012044	-0.00195	0.072239	-0.0033	0.033623
0.056898	-0.00563	0.008611	0.008369	0.004884	0.104339	-0.00053	0.02949
0.028535	0.0011	-0.00288	0.002427	-0.00315	0.018665	0.00305	0.007957
0.082802	-0.00376	0.007228	0.009921	-0.00581	0.012321	-0.00394	0.016462

Sigma_i	fce
0.098067	0.098067
0.146364	0.146364
0.198645	0.198645
0.220938	0.220938
0.190778	0.190778
0.077418	0.077418
0.181996	0.181996

Date	XOM	Apple	GS	returns			Variances
2/16/2021	52.04	133.19	311.96				
2/17/2021	52.85	130.84	312.74	0.015445	-0.0178	0.002497	0.000192
2/18/2021	52.02	129.71	309.9	-0.01583	-0.00867	-0.00912	0.000303
2/19/2021	52.37	129.87	315.62	0.006706	0.001233	0.018289	2.62E-05
2/22/2021	54.3	126	316.87	0.03619	-0.03025	0.003953	0.001197
2/23/2021	55.05	125.86	319.21	0.013718	-0.00111	0.007358	0.000147
2/24/2021	56.7	125.35	330.64	0.029532	-0.00406	0.035181	0.000781
2/25/2021	55.76	120.99	327.76	-0.01672	-0.0354	-0.00875	0.000335
2/26/2021	54.37	121.26	319.48	-0.02524	0.002229	-0.02559	0.00072
3/1/2021	56.4	127.79	329.92	0.036657	0.052451	0.032156	0.00123
3/2/2021	56.07	125.12	330.94	-0.00587	-0.02111	0.003087	5.56E-05
3/3/2021	56.52	122.06	334.43	0.007994	-0.02476	0.01049	4.1E-05
3/4/2021	58.71	120.13	329.29	0.038015	-0.01594	-0.01549	0.001327
3/5/2021	60.93	121.42	327.37	0.037116	0.010681	-0.00585	0.001262
3/8/2021	60.87	116.36	334.19	-0.00099	-0.04257	0.020619	6.63E-06
3/9/2021	59.93	121.09	330.59	-0.01556	0.039845	-0.01083	0.000294
3/10/2021	61.77	119.98	342.02	0.030241	-0.00921	0.03399	0.000821
3/11/2021	61.31	121.96	342.1	-0.00747	0.016368	0.000234	8.22E-05
3/12/2021	61.97	121.03	348.81	0.010707	-0.00765	0.019424	8.31E-05
3/15/2021	60.39	123.99	346.05	-0.02583	0.024162	-0.00794	0.000752
3/16/2021	59.11	125.57	341.71	-0.02142	0.012662	-0.01262	0.00053
3/17/2021	59.37	124.76	344.95	0.004389	-0.00647	0.009437	7.84E-06
3/18/2021	56.81	120.53	348	-0.04408	-0.03449	0.008803	0.002085
3/19/2021	56.49	119.99	344.2	-0.00565	-0.00449	-0.01098	5.24E-05
3/22/2021	55.91	123.39	339.33	-0.01032	0.027942	-0.01425	0.000142
3/23/2021	55.22	122.54	331.77	-0.01242	-0.00691	-0.02253	0.000196
3/24/2021	56.34	120.09	328.65	0.02008	-0.0202	-0.00945	0.000342
3/25/2021	56.18	120.59	330.55	-0.00284	0.004155	0.005765	1.97E-05
3/26/2021	57.71	121.21	327.39	0.02687	0.005128	-0.00961	0.000639
3/29/2021	57.4	121.39	325.73	-0.00539	0.001484	-0.00508	4.87E-05
3/30/2021	56.69	119.9	332.01	-0.01245	-0.01235	0.019096	0.000197
3/31/2021	55.83	122.15	327	-0.01529	0.018592	-0.0152	0.000285
4/1/2021	57.39	123	327.64	0.027559	0.006935	0.001955	0.000674
4/5/2021	56.5	125.9	323.54	-0.01563	0.023304	-0.01259	0.000296
4/6/2021	56.34	126.21	327.06	-0.00284	0.002459	0.010821	1.96E-05
4/7/2021	56.59	127.9	326.55	0.004428	0.013302	-0.00156	8.06E-06
4/8/2021	56	130.36	331.14	-0.01048	0.019051	0.013958	0.000146
4/9/2021	55.87	133	330.81	-0.00232	0.020049	-0.001	1.53E-05
4/12/2021	55.5	131.24	331.84	-0.00664	-0.01332	0.003109	6.78E-05
4/13/2021	55.71	134.43	327.68	0.003777	0.024016	-0.01262	4.78E-06
4/14/2021	57.32	132.03	335.35	0.02849	-0.01801	0.023137	0.000724
4/15/2021	56.98	134.5	338.55	-0.00595	0.018535	0.009497	5.68E-05
4/16/2021	56.66	134.16	342.31	-0.00563	-0.00253	0.011045	5.21E-05
4/19/2021	56.48	134.84	343.09	-0.00318	0.005056	0.002276	2.28E-05
4/20/2021	55.29	133.11	331.88	-0.02129	-0.01291	-0.03322	0.000524
4/21/2021	56	133.5	335.27	0.01276	0.002926	0.010163	0.000125
4/22/2021	55.27	131.94	330.85	-0.01312	-0.01175	-0.01327	0.000216
4/23/2021	55.57	134.32	339.35	0.005413	0.017878	0.025367	1.46E-05
4/26/2021	55.68	134.72	343.52	0.001978	0.002973	0.012213	1.51E-07

4/27/2021	56.41	134.39	346.63	0.013025	-0.00245	0.009013	0.000131
4/28/2021	58.11	133.58	348.11	0.029691	-0.00605	0.004261	0.00079
4/29/2021	58.94	133.48	352.97	0.014182	-0.00075	0.013865	0.000159
4/30/2021	57.24	131.46	348.45	-0.02927	-0.01525	-0.01289	0.000952
5/3/2021	58.82	132.54	350.16	0.027229	0.008182	0.004895	0.000657
5/4/2021	59.19	127.85	349.84	0.006271	-0.03603	-0.00091	2.19E-05
5/5/2021	60.97	128.1	357.62	0.029629	0.001954	0.021995	0.000786
5/6/2021	61.55	129.74	365.97	0.009468	0.012721	0.02308	6.21E-05
5/7/2021	62.43	130.21	370.89	0.014196	0.003616	0.013354	0.000159
5/10/2021	62.58	126.85	368.68	0.0024	-0.02614	-0.00598	6.57E-07
5/11/2021	60.59	125.91	359.92	-0.03232	-0.00744	-0.02405	0.00115
5/12/2021	60.04	122.77	354.4	-0.00912	-0.02525	-0.01546	0.000115
5/13/2021	59.3	124.97	358.81	-0.0124	0.017761	0.012367	0.000196
5/14/2021	60.77	127.45	368.77	0.024487	0.01965	0.02738	0.000524
5/17/2021	62.19	126.27	369.25	0.023098	-0.0093	0.001301	0.000463
5/18/2021	60.43	124.85	364.56	-0.02871	-0.01131	-0.01278	0.000918
5/19/2021	58.98	124.69	358.38	-0.02429	-0.00128	-0.0171	0.00067
5/20/2021	58.84	127.31	359.78	-0.00238	0.020794	0.003899	1.57E-05
5/21/2021	58.92	125.43	366.26	0.001359	-0.01488	0.017851	5.31E-08
5/24/2021	59.61	127.1	368.29	0.011643	0.013226	0.005527	0.000101
5/25/2021	58.26	126.9	364.51	-0.02291	-0.00157	-0.01032	0.0006
5/26/2021	58.94	126.85	367.4	0.011604	-0.00039	0.007897	0.0001
5/27/2021	58.56	125.28	371.37	-0.00647	-0.01245	0.010748	6.49E-05
5/28/2021	58.37	124.61	372.02	-0.00325	-0.00536	0.001749	2.34E-05
6/1/2021	60.46	124.28	382.44	0.03518	-0.00265	0.027624	0.001128
6/2/2021	60.94	125.06	383.44	0.007908	0.006257	0.002611	3.99E-05
6/3/2021	61.18	123.54	388.72	0.003931	-0.01223	0.013676	5.48E-06
6/4/2021	61.45	125.89	391.45	0.004404	0.018844	0.006999	7.92E-06
6/7/2021	61.05	125.9	388.16	-0.00653	7.95E-05	-0.00844	6.59E-05
6/8/2021	62.13	126.74	384.7	0.017536	0.00665	-0.00895	0.000254
6/9/2021	62.65	127.13	382.78	0.008335	0.003072	-0.005	4.55E-05
6/10/2021	62.75	126.11	373.94	0.001595	-0.00806	-0.02337	3.22E-11
6/11/2021	62.17	127.35	378.05	-0.00929	0.009785	0.010931	0.000118
6/14/2021	62.07	130.48	372.92	-0.00161	0.024281	-0.01366	1.02E-05
6/15/2021	64.33	129.64	371.3	0.035763	-0.00646	-0.00435	0.001168
6/16/2021	64.1	130.15	371	-0.00358	0.003926	-0.00081	2.67E-05
6/17/2021	61.99	131.79	361.5	-0.03347	0.012522	-0.02594	0.001229
6/18/2021	60.4	130.46	348.83	-0.02598	-0.01014	-0.03568	0.00076
6/21/2021	62.59	132.3	357.54	0.035616	0.014005	0.024663	0.001158
6/22/2021	63.79	133.98	357.53	0.018991	0.012618	-2.8E-05	0.000303
6/23/2021	64.26	133.7	361.05	0.007341	-0.00209	0.009797	3.31E-05
6/24/2021	64.52	133.41	368.75	0.004038	-0.00217	0.021102	6E-06
6/25/2021	64.66	133.11	368.77	0.002168	-0.00225	5.42E-05	3.35E-07
6/28/2021	63.01	134.78	368.71	-0.02585	0.012468	-0.00016	0.000753
6/29/2021	62.62	136.33	372.62	-0.00621	0.011435	0.010549	6.08E-05
6/30/2021	63.08	136.96	379.53	0.007319	0.004611	0.018375	3.28E-05
7/1/2021	63.26	137.27	374.99	0.002849	0.002261	-0.01203	1.59E-06
7/2/2021	63.17	139.96	374.16	-0.00142	0.019407	-0.00222	9.08E-06
7/6/2021	61.37	142.02	369.86	-0.02891	0.014611	-0.01156	0.00093
7/7/2021	60.41	144.57	367.67	-0.01577	0.017796	-0.00594	0.000301

7/8/2021	60.14	143.24	358.94	-0.00448	-0.00924	-0.02403	3.68E-05
7/9/2021	61.23	145.11	371.76	0.017962	0.012971	0.035093	0.000268
7/12/2021	61.17	144.5	380.5	-0.00098	-0.00421	0.023238	6.6E-06
7/13/2021	60.88	145.64	375.98	-0.00475	0.007858	-0.01195	4.02E-05
7/14/2021	59.53	149.15	374.4	-0.02242	0.023815	-0.00421	0.000577
7/15/2021	58.95	148.48	373.35	-0.00979	-0.0045	-0.00281	0.00013
7/16/2021	57.32	146.39	364.8	-0.02804	-0.01418	-0.02317	0.000878
7/19/2021	55.35	142.45	354.72	-0.03497	-0.02728	-0.02802	0.001337
7/20/2021	55.96	146.15	364.76	0.010961	0.025642	0.027911	8.78E-05
7/21/2021	57.76	145.4	373.5	0.031659	-0.00514	0.023678	0.000904
7/22/2021	57.11	146.8	372.71	-0.01132	0.009583	-0.00212	0.000167
7/23/2021	57.04	148.56	374.05	-0.00123	0.011918	0.003589	7.93E-06
7/26/2021	58.48	148.99	375.9	0.024932	0.00289	0.004934	0.000545
7/27/2021	57.83	146.77	374.84	-0.01118	-0.01501	-0.00282	0.000163
7/28/2021	58.22	144.98	374.23	0.006721	-0.01227	-0.00163	2.63E-05
7/29/2021	58.93	145.64	377.55	0.012121	0.004542	0.008832	0.000111
7/30/2021	57.57	145.86	374.88	-0.02335	0.001509	-0.0071	0.000622
8/2/2021	57.58	145.52	378.19	0.000174	-0.00233	0.008791	2E-06
8/3/2021	58.2	147.36	380.36	0.01071	0.012565	0.005721	8.32E-05
8/4/2021	56.84	146.95	377.86	-0.02365	-0.00279	-0.00659	0.000637
8/5/2021	57.2	147.06	384.3	0.006314	0.000748	0.0169	2.23E-05
8/6/2021	57.86	146.14	397.89	0.011472	-0.00628	0.034752	9.77E-05
8/9/2021	57.2	146.09	399.88	-0.01147	-0.00034	0.004989	0.000171
8/10/2021	58.18	145.6	407.97	0.016988	-0.00336	0.020029	0.000237
8/11/2021	58.35	145.86	413.89	0.002918	0.001784	0.014407	1.76E-06
8/12/2021	57.35	148.89	415	-0.01729	0.020561	0.002678	0.000356
8/13/2021	56.77	149.1	410.78	-0.01016	0.001409	-0.01022	0.000138
8/16/2021	55.94	151.12	408.35	-0.01473	0.013457	-0.00593	0.000266
8/17/2021	55.56	150.19	404.97	-0.00682	-0.00617	-0.00831	7.06E-05
8/18/2021	54.39	146.36	398.8	-0.02128	-0.02583	-0.01535	0.000523
8/19/2021	52.73	146.7	393.57	-0.031	0.00232	-0.0132	0.001062
8/20/2021	52.74	148.19	395.87	0.00019	0.010106	0.005827	1.96E-06
8/23/2021	54.91	149.71	401.45	0.040321	0.010205	0.013997	0.0015
8/24/2021	55.36	149.62	408.56	0.008162	-0.0006	0.017556	4.32E-05
8/25/2021	55.46	148.36	413.12	0.001805	-0.00846	0.011099	4.64E-08
8/26/2021	54.71	147.54	412.41	-0.01362	-0.00554	-0.00172	0.000231
8/27/2021	55.77	148.6	419.69	0.01919	0.007159	0.017498	0.00031
8/30/2021	55.16	153.12	413.6	-0.011	0.029964	-0.01462	0.000158
8/31/2021	54.52	151.83	413.51	-0.01167	-0.00846	-0.00022	0.000176
9/1/2021	53.77	152.51	413.66	-0.01385	0.004469	0.000363	0.000238
9/2/2021	55.08	153.65	414.5	0.024071	0.007447	0.002029	0.000505
9/3/2021	54.87	154.3	411.31	-0.00382	0.004222	-0.00773	2.93E-05
9/7/2021	54.55	156.69	410.32	-0.00585	0.015371	-0.00241	5.53E-05
9/8/2021	54.05	155.11	405	-0.00921	-0.01013	-0.01305	0.000117
9/9/2021	54.09	154.07	404.58	0.00074	-0.00673	-0.00104	7.21E-07
9/10/2021	53.98	148.97	403.48	-0.00204	-0.03366	-0.00272	1.31E-05
9/13/2021	55.37	149.55	409.26	0.025424	0.003886	0.014224	0.000568
9/14/2021	54.58	148.12	403.69	-0.01437	-0.00961	-0.0137	0.000255
9/15/2021	56.42	149.03	401.95	0.033156	0.006125	-0.00432	0.000996
9/16/2021	55.82	148.79	396.68	-0.01069	-0.00161	-0.0132	0.000151

9/17/2021	55.16	146.06	391.46	-0.01189	-0.01852	-0.01325	0.000182
9/20/2021	53.69	142.94	378.13	-0.02701	-0.02159	-0.03465	0.000818
9/21/2021	53.64	143.43	375.84	-0.00093	0.003422	-0.00607	6.35E-06
9/22/2021	55.21	145.85	385.47	0.028849	0.016732	0.0253	0.000743
9/23/2021	57.08	146.83	391.86	0.03331	0.006697	0.016441	0.001006
9/24/2021	57.59	146.92	390.85	0.008895	0.000613	-0.00258	5.34E-05
9/27/2021	59.3	145.37	399.81	0.02926	-0.01061	0.022666	0.000766
9/28/2021	59.92	141.91	389.5	0.010401	-0.02409	-0.02613	7.76E-05
9/29/2021	59.88	142.83	384.89	-0.00067	0.006462	-0.01191	5.09E-06
9/30/2021	58.82	141.5	378.03	-0.01786	-0.00936	-0.01798	0.000378
10/1/2021	60.93	142.65	380	0.035244	0.008094	0.005198	0.001133
10/4/2021	61.72	139.14	374.15	0.012882	-0.02491	-0.01551	0.000128
10/5/2021	61.62	141.11	385.81	-0.00162	0.014059	0.030688	1.03E-05
10/6/2021	60.49	142	388.05	-0.01851	0.006287	0.005789	0.000404
10/7/2021	60.66	143.29	390.62	0.002806	0.009043	0.006601	1.48E-06
10/8/2021	62.18	142.9	392.81	0.024749	-0.00273	0.005591	0.000536
10/11/2021	61.56	142.81	385.24	-0.01002	-0.00063	-0.01946	0.000135
10/12/2021	61.24	141.51	386.53	-0.00521	-0.00914	0.003343	4.63E-05
10/13/2021	61.07	140.91	386.31	-0.00278	-0.00425	-0.00057	1.91E-05
10/14/2021	62	143.76	391.2	0.015114	0.020024	0.012579	0.000183
10/15/2021	62.59	144.84	406.07	0.009471	0.007484	0.037307	6.21E-05
10/18/2021	62.56	146.55	413.69	-0.00048	0.011737	0.018591	4.28E-06
10/19/2021	63.5	148.76	412.16	0.014914	0.014968	-0.00371	0.000178
10/20/2021	63.85	149.26	407.89	0.005497	0.003355	-0.01041	1.53E-05
10/21/2021	62.69	149.48	407.59	-0.01833	0.001473	-0.00074	0.000397
10/22/2021	63.12	148.69	414.32	0.006836	-0.0053	0.016377	2.75E-05
10/25/2021	64.35	148.64	414.75	0.019299	-0.00034	0.001037	0.000314
10/26/2021	65.84	149.32	417.61	0.022891	0.004564	0.006872	0.000454
10/27/2021	64.13	148.85	410.99	-0.02632	-0.00315	-0.01598	0.000779
10/28/2021	64.31	152.57	414.82	0.002803	0.024684	0.009276	1.47E-06
10/29/2021	64.47	149.8	413.35	0.002485	-0.01832	-0.00355	8.02E-07
11/1/2021	65.63	148.96	416.7	0.017833	-0.00562	0.008072	0.000264
11/2/2021	64.82	150.02	423.85	-0.01242	0.007091	0.017013	0.000196
11/3/2021	63.93	151.49	417.9	-0.01383	0.009751	-0.01414	0.000238
11/4/2021	64.41	150.96	408.07	0.00748	-0.0035	-0.0238	3.47E-05
11/5/2021	65.02	151.28	407.08	0.009426	0.002117	-0.00243	6.14E-05
11/8/2021	65.72	150.44	408.34	0.010708	-0.00557	0.00309	8.32E-05
11/9/2021	66.36	150.81	405.35	0.009691	0.002456	-0.00735	6.56E-05
11/10/2021	64.19	147.92	399.12	-0.03325	-0.01935	-0.01549	0.001214
11/11/2021	64.31	147.87	402.34	0.001868	-0.00034	0.008035	7.75E-08
11/12/2021	63.82	149.99	404.91	-0.00765	0.014235	0.006367	8.53E-05
11/15/2021	64.37	150	404.81	0.008581	6.66E-05	-0.00025	4.89E-05
11/16/2021	65.02	151	403.09	0.010047	0.006645	-0.00426	7.15E-05
11/17/2021	64.31	153.49	391.55	-0.01098	0.016356	-0.02905	0.000158
11/18/2021	63.61	157.87	391.37	-0.01094	0.028136	-0.00046	0.000157
11/19/2021	60.67	160.55	387.39	-0.04732	0.016834	-0.01022	0.002392
11/22/2021	61.51	161.02	396.16	0.01375	0.002923	0.022386	0.000148
11/23/2021	63.13	161.41	406.34	0.025996	0.002419	0.025372	0.000596
11/24/2021	63.48	161.94	399.19	0.005529	0.003278	-0.01775	1.55E-05
11/26/2021	61.25	156.81	389.39	-0.03576	-0.03219	-0.02486	0.001395

11/29/2021	61.59	160.24	386.54	0.005536	0.021638	-0.00735	1.56E-05
11/30/2021	59.84	165.3	380.99	-0.02883	0.031089	-0.01446	0.000925
12/1/2021	59.79	164.77	376.48	-0.00084	-0.00321	-0.01191	5.88E-06
12/2/2021	61.28	163.76	387.54	0.024615	-0.00615	0.028954	0.00053
12/3/2021	60.89	161.84	382.73	-0.00638	-0.01179	-0.01249	6.36E-05
12/6/2021	61.58	165.32	389.3	0.011268	0.021275	0.01702	9.37E-05
12/7/2021	62.27	171.18	400.11	0.011143	0.034833	0.027389	9.13E-05
12/8/2021	62.45	175.08	397.32	0.002886	0.022527	-0.007	1.68E-06
12/9/2021	62.61	174.56	396.49	0.002559	-0.00297	-0.00209	9.4E-07
12/10/2021	63.01	179.45	391.06	0.006368	0.027628	-0.01379	2.28E-05
12/13/2021	61.63	175.74	384.64	-0.02214	-0.02089	-0.01655	0.000563
12/14/2021	61.54	174.33	388.82	-0.00146	-0.00806	0.010809	9.31E-06
12/15/2021	61.27	179.3	389.91	-0.0044	0.02811	0.002799	3.58E-05
12/16/2021	61.37	172.26	397.37	0.001631	-0.04006	0.018952	1.73E-09
12/17/2021	60.03	171.14	381.8	-0.02208	-0.00652	-0.03997	0.00056
12/20/2021	59.16	169.75	371.61	-0.0146	-0.00816	-0.02705	0.000262
12/21/2021	60.5	172.99	380.32	0.022398	0.018907	0.023168	0.000433
12/22/2021	60.99	175.64	382.33	0.008067	0.015203	0.005271	4.2E-05
12/23/2021	61.02	176.28	385.04	0.000492	0.003637	0.007063	1.2E-06
12/27/2021	61.89	180.33	388.04	0.014157	0.022715	0.007761	0.000158
12/28/2021	61.69	179.29	387.61	-0.00324	-0.00578	-0.00111	2.33E-05
12/29/2021	61.15	179.38	386.2	-0.00879	0.000502	-0.00364	0.000108
12/30/2021	60.79	178.2	385.52	-0.0059	-0.0066	-0.00176	5.62E-05
12/31/2021	61.19	177.57	382.55	0.006558	-0.00354	-0.00773	2.47E-05
1/3/2022	63.54	182.01	395.33	0.037686	0.024697	0.032861	0.001303
1/4/2022	65.93	179.7	407.48	0.036924	-0.01277	0.030271	0.001249
1/5/2022	66.75	174.92	398.63	0.012361	-0.02696	-0.02196	0.000116
1/6/2022	68.32	172	396.93	0.023248	-0.01683	-0.00427	0.000469
1/7/2022	68.88	172.17	397.51	0.008163	0.000988	0.00146	4.32E-05
1/10/2022	68.47	172.19	399.17	-0.00597	0.000116	0.004167	5.71E-05
1/11/2022	71.35	175.08	403.05	0.041202	0.016644	0.009673	0.001569
1/12/2022	71.14	175.53	390.31	-0.00295	0.002567	-0.03212	2.06E-05
1/13/2022	70.63	172.19	390.8	-0.00719	-0.01921	0.001255	7.72E-05
1/14/2022	71.87	173.07	380.94	0.017404	0.005098	-0.02555	0.00025
1/18/2022	73.08	169.8	354.4	0.016696	-0.01907	-0.07222	0.000228
1/19/2022	73.11	166.23	347.32	0.00041	-0.02125	-0.02018	1.39E-06
1/20/2022	73.27	164.51	348.1	0.002186	-0.0104	0.002243	3.56E-07
1/21/2022	72.17	162.41	343.91	-0.01513	-0.01285	-0.01211	0.000279
1/24/2022	72.79	161.62	343.39	0.008554	-0.00488	-0.00151	4.85E-05
1/25/2022	74.93	159.78	341.55	0.028976	-0.01145	-0.00537	0.00075
1/26/2022	74.17	159.69	342.68	-0.01019	-0.00056	0.003303	0.000139
1/27/2022	75.12	159.22	341.03	0.012727	-0.00295	-0.00483	0.000124
1/28/2022	75.28	170.33	347.01	0.002128	0.067451	0.017383	2.9E-07
1/31/2022	75.96	174.78	354.68	0.008992	0.02579	0.021862	5.48E-05
2/1/2022	80.83	174.61	364.06	0.062141	-0.00097	0.026103	0.003667
2/2/2022	80.62	175.84	363.06	-0.0026	0.00702	-0.00275	1.76E-05
2/3/2022	79.68	172.9	358.88	-0.01173	-0.01686	-0.01158	0.000177
2/4/2022	81.41	172.39	367.6	0.02148	-0.00295	0.024007	0.000396
2/7/2022	82.39	171.66	368.15	0.011966	-0.00424	0.001495	0.000108
2/8/2022	80.26	174.83	370.1	-0.02619	0.018298	0.005283	0.000772

2/9/2022	79	176.28	374.53	-0.01582	0.00826	0.011899	0.000303	
2/10/2022	78.24	172.12	370.57	-0.00967	-0.02388	-0.01063	0.000127	
2/11/2022	80.21	168.64	363.06	0.024867	-0.02043	-0.02047	0.000542	
2/14/2022	78.98	168.88	360.24	-0.01545	0.001422	-0.0078	0.00029	
2/15/2022	77.795	170.9801	363.035	-0.01512	0.012359	0.007729	0.000279	
			E(ri)	0.001589	0.000987	0.000599	var	0.000327
							fce	0.000327
							Sigma_i	0.018087

		Covar					
		XOM	Apple	GS	XOX-XOM	XOM-APPI	XOM-GS
0.000353	3.6E-06	0.013856	-0.01879	0.001898	0.000191984	-0.000260334	2.62968E-05
9.33E-05	9.45E-05	-0.01742	-0.00966	-0.00972	0.000303408	0.000168284	0.00016934
6.02E-08	0.000313	0.005116	0.000245	0.01769	2.6178E-05	1.25574E-06	9.05098E-05
0.000976	1.12E-05	0.034601	-0.03124	0.003353	0.001197238	-0.001080913	0.000116029
4.41E-06	4.57E-05	0.012128	-0.0021	0.006758	0.000147099	-2.54571E-05	8.19675E-05
2.55E-05	0.001196	0.027943	-0.00505	0.034582	0.000780822	-0.000141046	0.000966324
0.001324	8.74E-05	-0.01831	-0.03639	-0.00935	0.000335135	0.000666165	0.000171128
1.54E-06	0.000686	-0.02683	0.001242	-0.02619	0.000720032	-3.33244E-05	0.000702667
0.002649	0.000996	0.035067	0.051464	0.031556	0.001229729	0.001804715	0.001106598
0.000489	6.19E-06	-0.00746	-0.0221	0.002488	5.56139E-05	0.000164827	-1.85508E-05
0.000663	9.78E-05	0.006404	-0.02575	0.009891	4.10171E-05	-0.000164901	6.33476E-05
0.000286	0.000259	0.036426	-0.01693	-0.01609	0.001326876	-0.000616533	-0.000586027
9.4E-05	4.16E-05	0.035526	0.009694	-0.00645	0.001262127	0.000344389	-0.000229044
0.001897	0.000401	-0.00257	-0.04355	0.020019	6.62767E-06	0.000112127	-5.15384E-05
0.00151	0.000131	-0.01715	0.038858	-0.01143	0.000294205	-0.000666507	0.000196053
0.000104	0.001115	0.028651	-0.0102	0.033391	0.000820903	-0.000292135	0.000956698
0.000237	1.34E-07	-0.00906	0.015381	-0.00037	8.21564E-05	-0.000139412	3.3118E-06
7.47E-05	0.000354	0.009118	-0.00864	0.018825	8.31424E-05	-7.87991E-05	0.00017165
0.000537	7.3E-05	-0.02742	0.023175	-0.00854	0.000751642	-0.000635374	0.000234227
0.000136	0.000175	-0.02301	0.011675	-0.01322	0.000529578	-0.000268677	0.00030423
5.56E-05	7.81E-05	0.0028	-0.00746	0.008838	7.83839E-06	-2.08822E-05	2.47433E-05
0.001259	6.73E-05	-0.04567	-0.03548	0.008204	0.002085368	0.001620245	-0.000374627
3E-05	0.000134	-0.00724	-0.00548	-0.01158	5.23873E-05	3.96458E-05	8.38067E-05
0.000727	0.00022	-0.01191	0.026954	-0.01485	0.000141839	-0.000321017	0.000176848
6.24E-05	0.000535	-0.01401	-0.0079	-0.02313	0.000196202	0.000110654	0.000323993
0.000449	0.000101	0.01849	-0.02118	-0.01005	0.000341893	-0.000391687	-0.000185789
1E-05	2.67E-05	-0.00443	0.003168	0.005165	1.96526E-05	-1.40427E-05	-2.28982E-05
1.71E-05	0.000104	0.02528	0.004141	-0.01021	0.000639101	0.000104686	-0.000257988
2.47E-07	3.23E-05	-0.00698	0.000497	-0.00568	4.86548E-05	-3.46456E-06	3.9638E-05
0.000178	0.000342	-0.01404	-0.01334	0.018497	0.000197001	0.000187203	-0.000259618
0.00031	0.00025	-0.01688	0.017605	-0.0158	0.000284786	-0.000297087	0.000266706
3.54E-05	1.84E-06	0.025969	0.005947	0.001356	0.000674413	0.000154448	3.5215E-05
0.000498	0.000174	-0.01722	0.022316	-0.01319	0.00029648	-0.000384257	0.000227148
2.17E-06	0.000104	-0.00443	0.001472	0.010222	1.95812E-05	-6.51363E-06	-4.5231E-05
0.000152	4.67E-06	0.002838	0.012314	-0.00216	8.05618E-06	3.49522E-05	-6.13053E-06
0.000326	0.000178	-0.01207	0.018064	0.013359	0.00014568	-0.000218027	-0.00016124
0.000363	2.55E-06	-0.00391	0.019062	-0.0016	1.53142E-05	-7.45961E-05	6.24729E-06
0.000205	6.3E-06	-0.00823	-0.01431	0.002509	6.7794E-05	0.000117813	-2.06619E-05
0.00053	0.000175	0.002187	0.023029	-0.01321	4.78488E-06	5.03736E-05	-2.89064E-05
0.000361	0.000508	0.026901	-0.019	0.022538	0.000723651	-0.000511159	0.000606289
0.000308	7.92E-05	-0.00754	0.017548	0.008898	5.68284E-05	-0.000132283	-6.70747E-05
1.24E-05	0.000109	-0.00722	-0.00352	0.010446	5.21432E-05	2.54056E-05	-7.54286E-05
1.66E-05	2.81E-06	-0.00477	0.004068	0.001677	2.27633E-05	-1.94111E-05	-7.99984E-06
0.000193	0.001144	-0.02288	-0.0139	-0.03382	0.000523664	0.000318089	0.000773895
3.76E-06	9.15E-05	0.01117	0.001938	0.009563	0.000124778	2.16525E-05	0.000106827
0.000162	0.000192	-0.01471	-0.01274	-0.01387	0.000216402	0.000187434	0.000204041
0.000285	0.000613	0.003824	0.016891	0.024768	1.46232E-05	6.459E-05	9.47122E-05
3.95E-06	0.000135	0.000388	0.001986	0.011614	1.50809E-07	7.71346E-07	4.51018E-06

1.18E-05	7.08E-05	0.011436	-0.00344	0.008413	0.000130788	-3.93382E-05	9.6217E-05
4.95E-05	1.34E-05	0.028102	-0.00703	0.003661	0.000789731	-0.000197634	0.000102888
3.01E-06	0.000176	0.012593	-0.00174	0.013265	0.000158583	-2.18636E-05	0.00016705
0.000264	0.000182	-0.03086	-0.01624	-0.01349	0.000952103	0.000500986	0.000416175
5.18E-05	1.85E-05	0.02564	0.007195	0.004296	0.000657397	0.000184466	0.000110151
0.00137	2.29E-06	0.004681	-0.03701	-0.00151	2.19162E-05	-0.00017328	-7.08594E-06
9.34E-07	0.000458	0.02804	0.000966	0.021396	0.000786252	2.70962E-05	0.000599941
0.000138	0.000505	0.007879	0.011734	0.022481	6.20738E-05	9.24485E-05	0.000177122
6.91E-06	0.000163	0.012607	0.002629	0.012755	0.000158934	3.31418E-05	0.0001608
0.000736	4.32E-05	0.000811	-0.02713	-0.00658	6.57159E-07	-2.19935E-05	-5.33072E-06
7.1E-05	0.000607	-0.03391	-0.00843	-0.02465	0.001149555	0.000285654	0.000835643
0.000689	0.000258	-0.01071	-0.02624	-0.01605	0.000114662	0.000281	0.000171917
0.000281	0.000138	-0.01399	0.016774	0.011767	0.000195746	-0.000234681	-0.000164638
0.000348	0.000717	0.022898	0.018663	0.026781	0.000524308	0.000427345	0.000613221
0.000106	4.92E-07	0.021509	-0.01029	0.000702	0.000462627	-0.000221301	1.50884E-05
0.000151	0.000179	-0.0303	-0.0123	-0.01338	0.000917952	0.000372561	0.000405447
5.15E-06	0.000313	-0.02588	-0.00227	-0.0177	0.000669591	5.87282E-05	0.000457924
0.000392	1.09E-05	-0.00397	0.019807	0.0033	1.57267E-05	-7.85491E-05	-1.3085E-05
0.000252	0.000298	-0.00023	-0.01586	0.017251	5.31421E-08	3.65716E-06	-3.9769E-06
0.00015	2.43E-05	0.010054	0.012239	0.004928	0.000101075	0.000123047	4.95432E-05
6.56E-06	0.000119	-0.0245	-0.00256	-0.01092	0.000600095	6.27611E-05	0.000267407
1.91E-06	5.33E-05	0.010015	-0.00138	0.007298	0.000100301	-1.38344E-05	7.30882E-05
0.000181	0.000103	-0.00806	-0.01344	0.010148	6.49195E-05	0.0001083	-8.17683E-05
4.03E-05	1.32E-06	-0.00484	-0.00635	0.001149	2.34162E-05	3.07259E-05	-5.5621E-06
1.32E-05	0.00073	0.033591	-0.00364	0.027025	0.001128338	-0.000122238	0.000907786
2.78E-05	4.05E-06	0.006319	0.005269	0.002012	3.99247E-05	3.32945E-05	1.27135E-05
0.000175	0.000171	0.002341	-0.01322	0.013077	5.48213E-06	-3.09435E-05	3.0618E-05
0.000319	4.1E-05	0.002814	0.017856	0.006399	7.92043E-06	5.02534E-05	1.80095E-05
8.24E-07	8.17E-05	-0.00812	-0.00091	-0.00904	6.59321E-05	7.37104E-06	7.33994E-05
3.21E-05	9.13E-05	0.015947	0.005663	-0.00955	0.000254294	9.02982E-05	-0.00015234
4.35E-06	3.14E-05	0.006746	0.002085	-0.0056	4.55024E-05	1.40658E-05	-3.77935E-05
8.18E-05	0.000574	5.68E-06	-0.00904	-0.02396	3.223E-11	-5.13376E-08	-1.36049E-07
7.74E-05	0.000107	-0.01088	0.008797	0.010332	0.000118271	-9.56738E-05	-0.00011236
0.000543	0.000203	-0.0032	0.023294	-0.01426	1.02332E-05	-7.45146E-05	4.56226E-05
5.54E-05	2.45E-05	0.034174	-0.00745	-0.00495	0.001167872	-0.000254454	-0.000169262
8.64E-06	1.98E-06	-0.00517	0.002939	-0.00141	2.67389E-05	-1.51974E-05	7.27851E-06
0.000133	0.000704	-0.03506	0.011535	-0.02654	0.001229232	-0.000404417	0.00093048
0.000124	0.001316	-0.02757	-0.01113	-0.03628	0.000760279	0.000306895	0.001000263
0.000169	0.000579	0.034027	0.013018	0.024063	0.00115785	0.000442971	0.000818807
0.000135	3.94E-07	0.017402	0.011631	-0.00063	0.000302821	0.000202403	-1.09162E-05
9.48E-06	8.46E-05	0.005752	-0.00308	0.009198	3.30826E-05	-1.77112E-05	5.29036E-05
9.98E-06	0.00042	0.002449	-0.00316	0.020503	5.99581E-06	-7.73419E-06	5.02048E-05
1.05E-05	2.97E-07	0.000578	-0.00324	-0.00055	3.34593E-07	-1.87328E-06	-3.15307E-07
0.000132	5.81E-07	-0.02744	0.011481	-0.00076	0.000752877	-0.000315015	2.09087E-05
0.000109	9.9E-05	-0.0078	0.010447	0.009949	6.08072E-05	-8.14677E-05	-7.75845E-05
1.31E-05	0.000316	0.00573	0.003623	0.017775	3.28318E-05	2.07611E-05	0.00010185
1.62E-06	0.00016	0.00126	0.001274	-0.01263	1.58812E-06	1.60502E-06	-1.59209E-05
0.000339	7.92E-06	-0.00301	0.01842	-0.00282	9.07757E-06	-5.54966E-05	8.48166E-06
0.000186	0.000148	-0.0305	0.013624	-0.01216	0.000930101	-0.000415498	0.000370799
0.000283	4.27E-05	-0.01736	0.016809	-0.00654	0.000301218	-0.000291726	0.000113471

0.000105	0.000607	-0.00607	-0.01023	-0.02463	3.68289E-05	6.20797E-05	0.000149471
0.000144	0.00119	0.016373	0.011983	0.034494	0.000268072	0.000196201	0.000564767
2.7E-05	0.000512	-0.00257	-0.0052	0.022638	6.60291E-06	1.33615E-05	-5.81718E-05
4.72E-05	0.000157	-0.00634	0.006871	-0.01255	4.02121E-05	-4.35715E-05	7.95801E-05
0.000521	2.31E-05	-0.02401	0.022827	-0.00481	0.00057665	-0.000548167	0.000115519
3.01E-05	1.16E-05	-0.01138	-0.00549	-0.00341	0.000129502	6.24696E-05	3.87793E-05
0.00023	0.000565	-0.02963	-0.01516	-0.02377	0.000877891	0.000449274	0.000704181
0.000799	0.000819	-0.03656	-0.02827	-0.02862	0.001336792	0.00103363	0.001046401
0.000608	0.000746	0.009371	0.024655	0.027312	8.78217E-05	0.000231052	0.000255946
3.76E-05	0.000533	0.03007	-0.00613	0.023079	0.000904213	-0.000184395	0.000693991
7.39E-05	7.38E-06	-0.01291	0.008595	-0.00272	0.000166575	-0.000110935	3.50628E-05
0.000119	8.94E-06	-0.00282	0.010931	0.00299	7.92785E-06	-3.07765E-05	-8.41745E-06
3.62E-06	1.88E-05	0.023343	0.001903	0.004334	0.000544888	4.44234E-05	0.000101177
0.000256	1.17E-05	-0.01277	-0.016	-0.00342	0.000162978	0.000204257	4.37014E-05
0.000176	4.96E-06	0.005132	-0.01326	-0.00223	2.63381E-05	-6.8042E-05	-1.1434E-05
1.26E-05	6.78E-05	0.010532	0.003555	0.008233	0.000110926	3.74398E-05	8.67119E-05
2.73E-07	5.92E-05	-0.02494	0.000522	-0.0077	0.000621898	-1.30229E-05	0.000191929
1.1E-05	6.71E-05	-0.00142	-0.00332	0.008191	2.00355E-06	4.70068E-06	-1.15947E-05
0.000134	2.62E-05	0.009121	0.011578	0.005122	8.31902E-05	0.000105599	4.6718E-05
1.42E-05	5.17E-05	-0.02523	-0.00377	-0.00719	0.000636768	9.522E-05	0.000181528
5.71E-08	0.000266	0.004724	-0.00024	0.0163	2.23202E-05	-1.12892E-06	7.70102E-05
5.27E-05	0.001166	0.009883	-0.00726	0.034153	9.76779E-05	-7.17801E-05	0.00033754
1.77E-06	1.93E-05	-0.01306	-0.00133	0.00439	0.000170605	1.73648E-05	-5.7335E-05
1.89E-05	0.000378	0.015399	-0.00435	0.01943	0.000237115	-6.6936E-05	0.000299191
6.35E-07	0.000191	0.001328	0.000797	0.013807	1.76487E-06	1.05861E-06	1.83428E-05
0.000383	4.32E-06	-0.01888	0.019573	0.002079	0.000356292	-0.000369459	-3.92415E-05
1.78E-07	0.000117	-0.01175	0.000422	-0.01082	0.000138156	-4.96318E-06	0.000127178
0.000155	4.27E-05	-0.01632	0.01247	-0.00653	0.000266262	-0.000203475	0.000106593
5.13E-05	7.94E-05	-0.00841	-0.00716	-0.00891	7.06494E-05	6.01842E-05	7.48996E-05
0.000719	0.000254	-0.02287	-0.02682	-0.01595	0.000523148	0.000613417	0.000364868
1.78E-06	0.00019	-0.03258	0.001333	-0.0138	0.001061778	-4.34384E-05	0.000449684
8.31E-05	2.73E-05	-0.0014	0.009118	0.005228	1.95866E-06	-1.27613E-05	-7.31614E-06
8.5E-05	0.00018	0.038732	0.009218	0.013398	0.001500174	0.000357019	0.000518927
2.52E-06	0.000288	0.006573	-0.00159	0.016956	4.31999E-05	-1.04417E-05	0.000111449
8.92E-05	0.00011	0.000216	-0.00944	0.0105	4.64425E-08	-2.03527E-06	2.26281E-06
4.26E-05	5.38E-06	-0.0152	-0.00653	-0.00232	0.000231184	9.92825E-05	3.52657E-05
3.81E-05	0.000286	0.0176	0.006172	0.016899	0.000309775	0.000108624	0.00029743
0.00084	0.000232	-0.01259	0.028976	-0.01522	0.000158438	-0.000364734	0.000191531
8.93E-05	6.67E-07	-0.01326	-0.00945	-0.00082	0.000175818	0.000125272	1.08321E-05
1.21E-05	5.6E-08	-0.01544	0.003481	-0.00024	0.000238428	-5.37569E-05	3.65395E-06
4.17E-05	2.04E-06	0.022482	0.00646	0.001429	0.000505433	0.00014523	3.21328E-05
1.05E-05	6.93E-05	-0.00541	0.003234	-0.00833	2.92591E-05	-1.74948E-05	4.50318E-05
0.000207	9.05E-06	-0.00744	0.014383	-0.00301	5.53272E-05	-0.000106986	2.23826E-05
0.000124	0.000186	-0.0108	-0.01112	-0.01365	0.000116583	0.000120089	0.00014738
5.95E-05	2.68E-06	-0.00085	-0.00771	-0.00164	7.21459E-07	6.55276E-06	1.39037E-06
0.001201	1.1E-05	-0.00362	-0.03465	-0.00332	1.31399E-05	0.000125601	1.20413E-05
8.4E-06	0.000186	0.023835	0.002899	0.013624	0.000568113	6.90889E-05	0.00032474
0.000112	0.000205	-0.01596	-0.0106	-0.0143	0.000254707	0.000169096	0.000228265
2.64E-05	2.42E-05	0.031567	0.005138	-0.00492	0.000996471	0.00016218	-0.000155273
6.75E-06	0.00019	-0.01228	-0.0026	-0.0138	0.000150814	3.19172E-05	0.000169438

0.00038	0.000192	-0.01348	-0.01951	-0.01385	0.000181801	0.000263001	0.000186689
0.00051	0.001242	-0.0286	-0.02258	-0.03524	0.000817988	0.000645792	0.001008012
5.93E-06	4.45E-05	-0.00252	0.002435	-0.00667	6.3549E-06	-6.138E-06	1.68241E-05
0.000248	0.00061	0.02726	0.015744	0.024701	0.000743099	0.000429191	0.000673333
3.26E-05	0.000251	0.031721	0.005709	0.015842	0.001006194	0.000181108	0.000502515
1.4E-07	1.01E-05	0.007306	-0.00037	-0.00318	5.33766E-05	-2.73604E-06	-2.32331E-05
0.000134	0.000487	0.027671	-0.01159	0.022066	0.000765693	-0.000320799	0.000610599
0.000629	0.000714	0.008812	-0.02508	-0.02672	7.76483E-05	-0.000220968	-0.000235495
3E-05	0.000156	-0.00226	0.005475	-0.01251	5.09368E-06	-1.23562E-05	2.8224E-05
0.000107	0.000345	-0.01945	-0.01034	-0.01858	0.000378296	0.000201163	0.000361443
5.05E-05	2.11E-05	0.033655	0.007107	0.004598	0.001132628	0.000239186	0.000154757
0.000671	0.00026	0.011293	-0.0259	-0.01611	0.000127536	-0.000292501	-0.000181976
0.000171	0.000905	-0.00321	0.013072	0.030089	1.03089E-05	-4.19706E-05	-9.66082E-05
2.81E-05	2.69E-05	-0.0201	0.0053	0.00519	0.000403912	-0.000106519	-0.000104303
6.49E-05	3.6E-05	0.001217	0.008056	0.006002	1.48162E-06	9.80617E-06	7.30543E-06
1.38E-05	2.49E-05	0.02316	-0.00371	0.004992	0.000536372	-8.59849E-05	0.000115602
2.62E-06	0.000402	-0.01161	-0.00162	-0.02006	0.000134798	1.87763E-05	0.000232889
0.000103	7.53E-06	-0.0068	-0.01013	0.002744	4.62524E-05	6.89064E-05	-1.86596E-05
2.74E-05	1.37E-06	-0.00437	-0.00524	-0.00117	1.90885E-05	2.28771E-05	5.10583E-06
0.000362	0.000144	0.013524	0.019037	0.01198	0.000182911	0.000257459	0.000162016
4.22E-05	0.001347	0.007882	0.006497	0.036707	6.21251E-05	5.12107E-05	0.000289325
0.000116	0.000324	-0.00207	0.01075	0.017992	4.27909E-06	-2.2237E-05	-3.72182E-05
0.000195	1.85E-05	0.013325	0.01398	-0.0043	0.000177545	0.000186282	-5.73568E-05
5.61E-06	0.000121	0.003907	0.002368	-0.01101	1.52682E-05	9.25383E-06	-4.30343E-05
2.36E-07	1.78E-06	-0.01992	0.000486	-0.00134	0.000396958	-9.67549E-06	2.66006E-05
3.95E-05	0.000249	0.005247	-0.00629	0.015778	2.75262E-05	-3.29808E-05	8.27777E-05
1.75E-06	1.92E-07	0.01771	-0.00132	0.000438	0.000313646	-2.34407E-05	7.75673E-06
1.28E-05	3.93E-05	0.021301	0.003577	0.006273	0.00045375	7.61993E-05	0.000133618
1.71E-05	0.000275	-0.0279	-0.00414	-0.01658	0.000778659	0.000115519	0.000462611
0.000562	7.53E-05	0.001214	0.023697	0.008677	1.47306E-06	2.87612E-05	1.05307E-05
0.000373	1.72E-05	0.000896	-0.01931	-0.00415	8.02311E-07	-1.7296E-05	-3.71661E-06
4.37E-05	5.58E-05	0.016244	-0.00661	0.007473	0.000263857	-0.000107378	0.000121382
3.73E-05	0.000269	-0.01401	0.006104	0.016414	0.00019622	-8.54976E-05	-0.000229922
7.68E-05	0.000217	-0.01541	0.008764	-0.01474	0.000237611	-0.00013509	0.000227162
2.02E-05	0.000595	0.005891	-0.00449	-0.0244	3.47044E-05	-2.64622E-05	-0.000143757
1.28E-06	9.17E-06	0.007837	0.00113	-0.00303	6.14142E-05	8.85733E-06	-2.37324E-05
4.3E-05	6.21E-06	0.009119	-0.00656	0.002491	8.31608E-05	-5.97795E-05	2.27174E-05
2.16E-06	6.32E-05	0.008102	0.001469	-0.00795	6.56422E-05	1.19032E-05	-6.4399E-05
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0.000176	3.33E-05	-0.00924	0.013248	0.005768	8.53347E-05	-0.00012238	-5.32832E-05
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3.2E-05	2.36E-05	0.008458	0.005657	-0.00486	7.15369E-05	4.78492E-05	-4.10825E-05
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3.75E-06	0.000475	0.012161	0.001936	0.021787	0.000147896	2.35433E-05	0.000264956
2.05E-06	0.000614	0.024407	0.001432	0.024773	0.000595711	3.49485E-05	0.000604633
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0.000906	0.000227	-0.03041	0.030102	-0.01506	0.000925034	-0.000915535	0.000458089
1.76E-05	0.000156	-0.00243	-0.0042	-0.01251	5.88102E-06	1.01821E-05	3.03316E-05
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1.57E-05	7.24E-06	0.00097	-0.00396	-0.00269	9.40096E-07	-3.84125E-06	-2.6087E-06
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8.18E-05	0.000104	-0.00305	-0.00904	0.010209	9.30605E-06	2.75859E-05	-3.11445E-05
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2.36E-07	1.8E-05	-0.01038	-0.00049	-0.00424	0.000107768	5.0381E-06	4.40528E-05
5.76E-05	5.58E-06	-0.00749	-0.00759	-0.00236	5.61565E-05	5.68569E-05	1.76977E-05
2.05E-05	6.94E-05	0.004969	-0.00453	-0.00833	2.46935E-05	-2.25047E-05	-4.14089E-05
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4.06E-13	7.41E-07	0.006574	6.37E-07	0.000861	4.32185E-05	4.18893E-09	5.65953E-06
7.59E-07	1.27E-05	-0.00756	-0.00087	0.003568	5.7143E-05	6.58456E-06	-2.69716E-05
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2.5E-06	0.001071	-0.00454	0.00158	-0.03272	2.05821E-05	-7.16672E-06	0.000148436
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3.44E-05	4.46E-06	0.006965	-0.00586	-0.00211	4.85111E-05	-4.08385E-05	-1.47131E-05
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0.000244	0.000256						
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Covar_M	XOM	Apple
XOM	0.000327152	1.93052E-05
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GS	0.000142663	5.78438E-05

APP-APP	APP-GS	GS-GS
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9.39716E-05	-6.2E-05	4.15656E-05
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8.9258E-05	7.72E-06	6.6736E-07
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4.173E-05	9.23E-06	2.04284E-06
1.04607E-05	-2.7E-05	6.93072E-05
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0.000175508	7.64E-05	3.32702E-05
8.47504E-07	7.79E-07	7.16256E-07
3.20051E-05	-2.7E-05	2.35931E-05
0.000236187	-0.00046	0.000878883
0.000737079	-2.9E-05	1.1217E-06
0.000251106	-0.00017	0.000117088
3.74783E-06	4.22E-05	0.000474669
2.05033E-06	3.55E-05	0.000613689
5.24839E-06	-4.2E-05	0.000336798
0.001100798	0.000845	0.000647975

0.000426448	-0.00016	6.3129E-05
0.000906134	-0.00045	0.000226851
1.76288E-05	5.25E-05	0.000156436
5.09212E-05	-0.0002	0.000803997
0.000163353	0.000167	0.000171311
0.000411588	0.000333	0.000269653
0.001145506	0.000907	0.000717701
0.00046398	-0.00016	5.77107E-05
1.56954E-05	1.07E-05	7.23895E-06
0.000709735	-0.00038	0.000207046
0.000478655	0.000375	0.000294206
8.17727E-05	-9.2E-05	0.000104231
0.000735662	5.97E-05	4.84052E-06
0.001684503	-0.00075	0.000336817
5.64037E-05	0.000305	0.001645945
8.35834E-05	0.000253	0.000764595
0.00032112	0.000404	0.000509353
0.000202077	6.64E-05	2.18252E-05
7.02228E-06	1.71E-05	4.17816E-05
0.000472091	0.000156	5.12928E-05
4.58489E-05	1.16E-05	2.91766E-06
2.3553E-07	2.06E-06	1.80077E-05
5.7566E-05	1.79E-05	5.57745E-06
2.051E-05	3.77E-05	6.94392E-05
0.000562137	0.000765	0.001040849
0.000189339	-0.00041	0.000880413
0.000781051	0.00063	0.000508841
0.000317605	8.68E-05	2.37467E-05
4.0601E-13	5.49E-10	7.41124E-07
7.58736E-07	-3.1E-06	1.27306E-05
0.00024515	0.000142	8.2335E-05
2.49546E-06	-5.2E-05	0.001070507
0.000407986	-1.3E-05	4.2941E-07
1.68955E-05	-0.00011	0.000683995
0.000402489	0.001461	0.005302023
0.000494448	0.000462	0.000431764
0.000129692	-1.9E-05	2.70254E-06
0.000191394	0.000176	0.000161521
3.43794E-05	1.24E-05	4.46241E-06
0.000154685	7.43E-05	3.56663E-05
2.40451E-06	-4.2E-06	7.30997E-06
1.54825E-05	2.13E-05	2.94404E-05
0.004417411	0.001116	0.000281698
0.000615192	0.000527	0.000452116
3.84297E-06	-5E-05	0.000650425
3.63888E-05	-2E-05	1.12217E-05
0.000318563	0.000217	0.000148336
1.55334E-05	-9.2E-05	0.000547935
2.73611E-05	-4.7E-06	8.02341E-07
0.000299672	8.11E-05	2.19352E-05

5.28866E-05	8.22E-05	0.000127675
0.000618467	0.000279	0.000126087
0.00045851	0.000451	0.000444096
1.89172E-07	-3.7E-06	7.0509E-05
0.000129312	8.11E-05	5.08298E-05
0.000244034	5.78E-05	0.000256426

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0.000142663
5.78438E-05
0.000256426