The Long And Short Of It

One of grimmer episodes in American cultural history, *The Gong Show*, arrived in the bicentennial year of 1976. Contestants displayed their talents, such as they were, until a judge ended the nightmare with a bang on the gong. Victory went to those who forestalled the gong the longest. Explaining a complex financial notion is a lot like being under the gong, which may explain why so many of the financial pundits polluting the once-sacred soil of daytime television take the simple way out and tell you to buy what they already own.

For Whom The Gong Tolls

A good way to get "gonged off" is to start talking about things such as variance-covariance matrices and correlation tables, so I'll just leave it as saying both concepts measure the degree to which two variables, such as two stock prices, move together. Any stock has a correlation of 1.00 with itself, a correlation of -1.00 with its short position, and a correlation of 0.00 against something totally random, like its earnings history (just kidding).

The concepts are absolutely critical to both modern portfolio theory (idle thought: What was portfolio theory like in the Roman Empire?) and to the emerging world of single stock futures (SSFs). For portfolio theory, the covariance is important because of its effect on total risk. Let's say you own both UAL and AMR. These two airlines are affected by the same macroeconomic and industry-specific factors, and we should expect them to have a high covariance. The formula for their combined variance would be:

variance(UAL+AMR) = variance(UAL) + variance(AMR) + 2*covariance(UAL+AMR)

Over the past four years, the daily variance of returns for UAL and AMR has been .114% and .111%, respectively, and their covariance of returns has been .086% per day. Add these two together, and the daily portfolio variance jumps to a whopping .398%. If any of this sounds familiar to those of you who diversified by owning every tech stock available back in 1999, it should.

However, if we go long one and short the other, we now subtract the covariance term:

variance(UAL-AMR) = variance(UAL) + variance(AMR) - 2*covariance(UAL+AMR)

The variance of this matched pair trade falls to .052% per day, less than half of each individual stock's variance. True, you won't make anywhere near as much as you would if you were right on both, but you won't lose as much if you're wrong, either. We come right back to that whole tortoise-and-hare thing, as if any amount of money can compensate for living in a shell for 150 years.

No Pair For Apple

Let's take a group of nine pairs of stocks that might, just might, – am I coy, or what? – show up in the initial list of SSFs:

1. General Motors / Ford
2. Qualcomm / Nokia
3. Tyco / General Electric
4. Pfizer / Merck
5. Citigroup / JP Morgan Chase
6. Home Depot / Wal-Mart
7. Coca-Cola / Pepsico
8. Procter & Gamble / Johnson & Johnson
9. ChevronTexaco / ExxonMobil

Now let's construct a correlation matrix of each stock's returns, not only against those of their designated partner, but against the remaining sixteen stocks as well. The table below can be read like a mileage guide in a roadmap. Each stock has a 1.00 correlation with itself. The maximum correlation in each column is highlighted; in all cases, the maximum correlation is, unsurprisingly, with the designated partner.

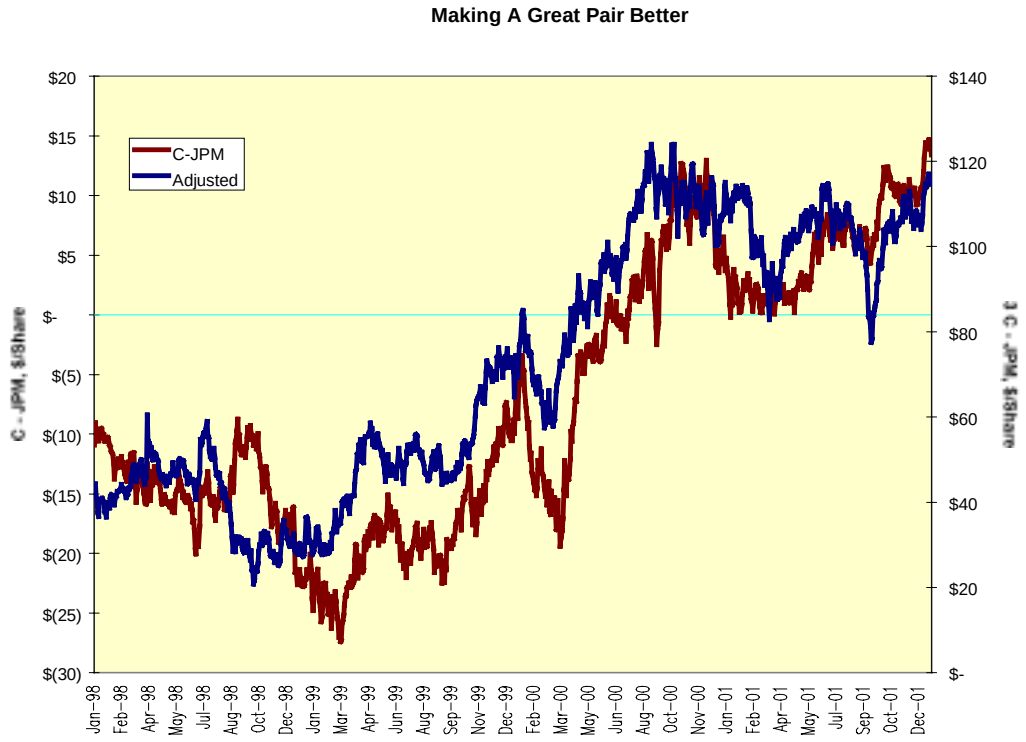
Correlation Matrix

	GM	F	QCOM	NOK	TYC	GE	PFE	MRK	C	JPM	HD	WMT	KO	PEP	PG	JNJ	CVX	XOM
GM	1.00																	
F	0.51	1.00																
QCOM	0.22	0.19	1.00															
NOK	0.30	0.24	0.46	1.00														
TYC	0.28	0.24	0.24	0.33	1.00													
GE	0.37	0.37	0.36	0.37	0.38	1.00												
PFE	0.14	0.17	0.12	0.13	0.25	0.31	1.00											
MRK	0.10	0.19	0.06	0.10	0.16	0.26	0.54	1.00										
C	0.38	0.38	0.30	0.37	0.32	0.53	0.27	0.23	1.00									
JPM	0.41	0.37	0.27	0.38	0.33	0.52	0.22	0.22	0.72	1.00								
HD	0.33	0.20	0.27	0.33	0.28	0.50	0.22	0.22	0.45	0.44	1.00							
WMT	0.27	0.20	0.21	0.26	0.23	0.47	0.29	0.29	0.40	0.37	0.59	1.00						
KO	0.14	0.22	0.10	0.06	0.10	0.27	0.24	0.26	0.23	0.20	0.22	0.29	1.00					
PEP	0.14	0.12	0.08	0.08	0.13	0.23	0.25	0.30	0.14	0.14	0.20	0.24	0.39	1.00				
PG	0.14	0.17	0.08	0.07	0.09	0.26	0.26	0.29	0.20	0.14	0.15	0.26	0.33	0.27	1.00			
JNJ	0.12	0.16	0.09	0.08	0.13	0.30	0.46	0.51	0.20	0.14	0.16	0.28	0.30	0.31	0.31	1.00		
CVX	0.10	0.12	-0.01	0.05	0.06	0.13	0.16	0.14	0.14	0.12	0.11	0.13	0.14	0.16	0.03	0.15	1.00	
XOM	0.08	0.11	0.03	0.02	0.03	0.15	0.20	0.18	0.16	0.14	0.17	0.15	0.22	0.16	0.07	0.19	0.60	1.00

Now let's take the pair with the highest correlation, Citigroup / JP Morgan Chase. We could trade this spread by buying the SSF of one and selling the SSF of the other, and there will be many who will do just that. However, a simple one-to-one spread ignores the different statistical characteristics of these two stocks. A regression of Citigroup as a function of JP Morgan Chase over the past four years yields the following equation:

Citigroup = 25.57 + **.30** * JP Morgan Chase

The highlighted coefficient, the .30 number, can be interpreted as saying Citigroup is roughly one-third as volatile in price as JP Morgan Chase, and therefore we should trade three Citigroup futures for each JP Morgan Chase future. The two spread trades, one adjusted for this hedge ratio and the other left as one-for-one, are depicted below.



Which Should You Use?

SSFs can be used both for speculation and for hedging. If you think Citigroup is going to outperform JP Morgan Chase, you could buy Citigroup futures and sell JP Morgan Chase futures. If you already own JP Morgan Chase and want to hedge your holdings, you should calculate a hedge ratio for the number of Citigroup futures to sell.

Either way, you'll be able to take advantage of SSFs and their ability to facilitate the short side of any stock transaction. Understanding risk management and how statistical measures such as covariance can be used have always been important, but they are likely to be increasingly important in the years ahead. And, yes, for the many of

you who have inquired about my forthcoming Internet course, these matters will be discussed. As a bonus, I'll tell you what the all-time champion act on *The Gong Show* was.