

## An Efficient Use Of Resources

Pity the wretched souls stuck in some imaginary period of their own glorious past, always dancing the Time Warp again. Alas, the financial community harbors a large number of such unfortunates who are certain that, any day now, the calendar will once again read "1979," that moving averages will forever cross over one another with huge trends resulting, and that the blood-curdling war cry "BREAKOUT!" will be shouted fearlessly in trading rooms across the land. Oh, and yes, this vision of the Shining City also includes the happy thought that investors will flee the burning wrecks of their mutual funds and pour millions and billions (the actual number could run well into the thousands) of dollars into the waiting hands of commodity fund managers.

Why bother with such fatuous self-delusion when, right across our northern border, the Canadian stock market, the eighth-largest in the world, offers a liquid equity market with a heavy natural resource exposure, as highlighted in the table below? In addition to providing U.S. portfolio managers and futures traders with some interesting opportunities to diversify exposures and increase returns, the Toronto Stock Exchange is trying actively to redefine its role as an exchange.

### Commodity-Based Equities

The industry weights below are from March 31, 1997. While the Toronto 300 is certainly a more broad-based index than the Toronto 35 (TX), the TX futures and options are the leading derivative product on the Canadian market.

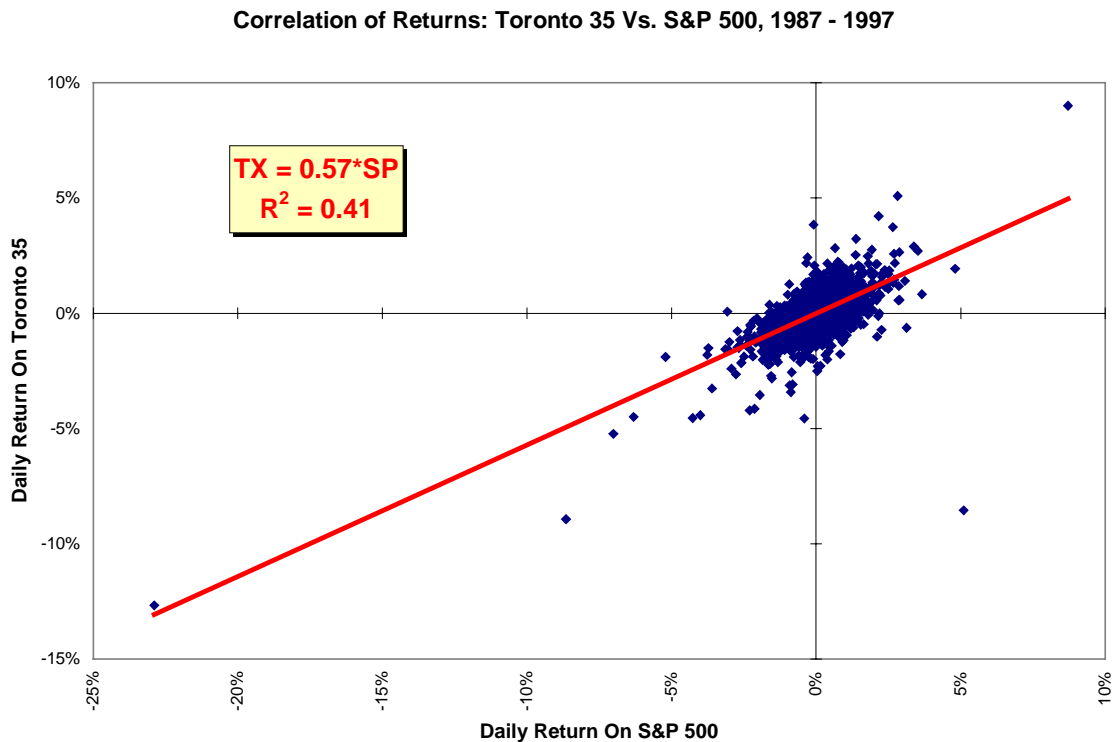
<u>Toronto 35 Stock Index</u>	
<u>Group</u>	<u>Weight</u>
Financial Services	21.41%
Industrial Products	14.64%
<b>Oil &amp; Gas</b>	<b>12.06%</b>
Utilities	9.03%
<b>Gold &amp; Precious Minerals</b>	<b>8.93%</b>
<b>Metals &amp; Minerals</b>	<b>8.24%</b>
Consumer Products	7.26%
Conglomerates	4.68%
Paper & Forest Products	4.23%
Communications & Media	3.84%
Merchandising	2.67%
Transportation/Environmental Services	1.59%
Pipelines	1.42%
<b>Resource-Based Subtotal:</b>	<b>29.23%</b>

Of course, commodity-linked equities and commodities are not the same thing, especially if the underlying company is vertically-integrated. For example, the petroleum-producing subsidiary of an integrated oil company may suffer when oil prices drop, but refining margins may expand to the extent that the entire corporation—and its stock – are no worse off than before. Even when vertical integration is rare in an industry, like in gold mining, the stock may continue to do well if investors believe that future earnings will be unaffected: As gold prices fall, marginal high-cost mines are closed, anticipated production is sold forward at repurchase rates of return, and overall operating margins remain protected to some extent.

The reasonably free flow of funds across borders allows resources to be allocated efficiently amongst competing financial assets. In the case of fixed income instruments, the net result of

these capital flows is one real risk-adjusted interest rate at every maturity around the world; foreign exchange rates do nothing more than equilibrate different nominal interest rates back to real interest rates. If equity markets are composed of companies with similar earnings prospects and industry factor exposures, then their price histories should be similar as well (see "Just The DAX, Ma'am," *Futures*, August 1997).

The correlation of daily returns between the S&P 500 and the U.S. dollar value of the Toronto 35 indicates that the two indices must have significant differences in their constituent factor exposures. If the two indices were in fact substitutes for one another, we should expect both the regression coefficient and the  $R^2$  to be near 1.00; instead, they are 0.57 and .41, respectively. What accounts for the difference?



### The Golden Constant

The natural resource exposure of the TX suggests that commodity price exposure may contribute to the tracking difference between the two equity markets. Consider the correlation matrix between daily returns on the currency-adjusted TX, the S&P 500, and the spot contracts of gold, crude oil, natural gas, and copper:

	TX	SP	GC	CL	NG	HG
TX	1.000					
SP	0.523	1.000				
GC	0.058	-0.215	1.000			
CL	-0.033	-0.189	0.277	1.000		
NG	0.021	-0.009	0.026	0.129	1.000	
HG	0.027	0.018	0.042	-0.051	-0.003	1.000

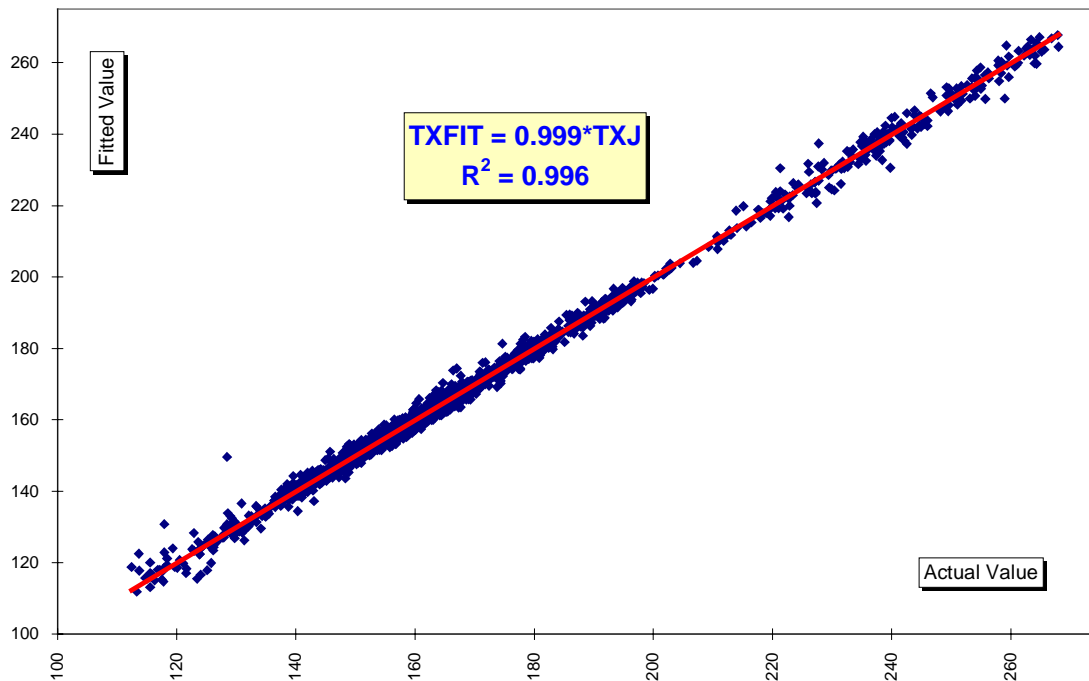
Neither natural gas nor copper appear to have any significant correlation to the TX, and, somewhat surprisingly, crude oil returns actually are negatively correlated to the index. Gold,

however, has both a positive correlation to the TX and a negative correlation to the S&P 500. If we regress the TX returns against the S&P 500 returns and examine the residuals, we find that gold has a strong explanatory effect. A final model is

$$TX_{ret}^* = .604 * SP_{ret} + .207 * GC_{ret}, R^2 = .442,$$

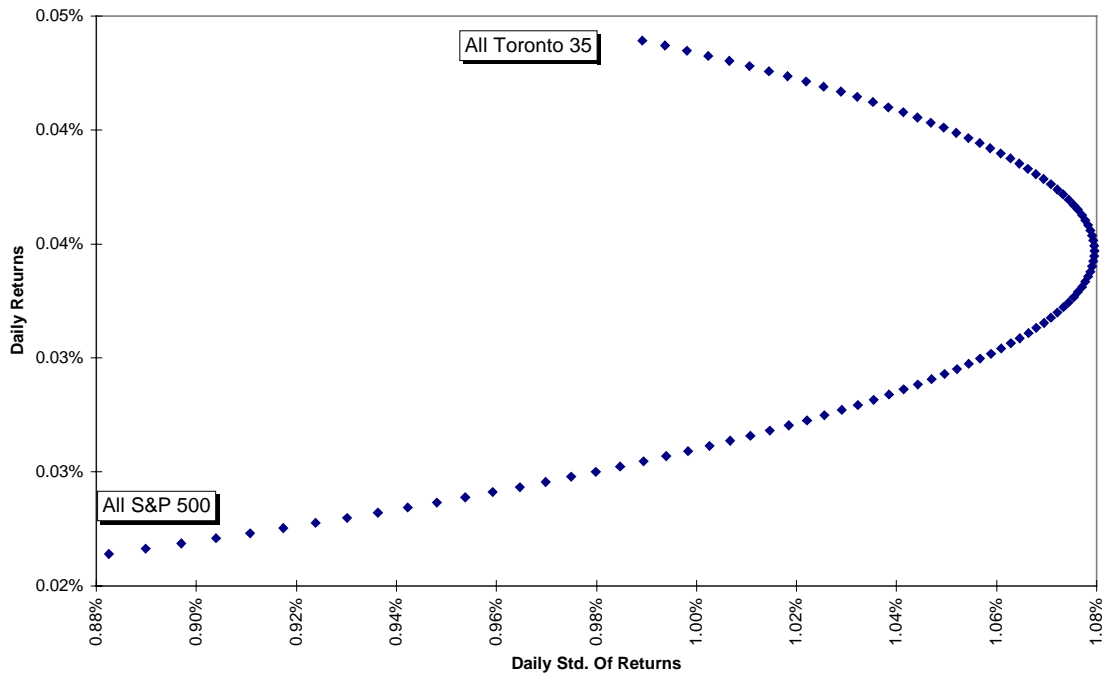
where  $TX_{ret}^*$  is the adjusted return on the TX,  $SP_{ret}$  is the return on the S&P 500, and  $GC_{ret}$  is the return on gold. Once we convert daily returns back into actual index values, we should expect them to correlate to the underlying index with a coefficient and an  $R^2$  both equal to 1.00, with a stable band of variance around the trendline. This is exactly the case.

**Toronto 35 Fitted Value Vs. Actual \$U.S. Value, 1987 - 1997**



Since the Canadian market is correlated positively with both gold and the U.S. market, while the U.S. market is negatively correlated with gold, one would expect the variance of a combined TX / S&P 500 portfolio to be lower than that of the S&P alone. However, the daily risk-return profile of the TX from 1987 to 1997 dominates that of the S&P 500; a combined portfolio has a greater daily variance than does a portfolio consisting solely of a single index, and the returns of a 100% TX portfolio exceed that of any blend, as shown in the graph below. This is not an argument for exclusive investment in Canada, of course, since that market could not begin to absorb the dollar volume invested in the U.S.

Risk-Return Profile Of Toronto 35 / S&P 500 Portfolios



## Seeing The Future

The Toronto Stock Exchange, which oversees the Toronto Futures Exchange where the Toronto 35 futures and options trade, has made a virtue of necessity in embracing technology over the past few years. While the U.S. was supposed to have a national market system for equity trading by 1975, (the same year we were supposed to adopt the metric system) the various parochial interests of the U.S. financial system have made this an obvious non-reality. In contrast, the TSE has eliminated the trading floor for its equity market and is committed to full automation for its listed derivative instruments on the TFE as well. Prices are in decimals, as opposed to fractions. Most importantly, the TSE is committed to expanding the use of derivative products as both trading vehicles per se and as risk management products for investors. Lower cost to investors, greater liquidity, and greater transparency of both price orders and resting order sizes are cited specifically as reasons behind the drive to full automation.

The entire raison d'être of an exchange is to provide the most efficient medium for price discovery and transaction facilitation. Close behind is the credit quality of an exchange clearinghouse. Advances in technology are eroding the first natural advantage of an exchange while the increasing sophistication of institutional investors in OTC arrangements is eroding the second advantage.

All exchanges worldwide are faced with these losses of competitive advantage. The responses to these challenges vary in terms of flexible product introduction, trading automation, adoption of market making roles, etc. As in any competitive business situation, only two things are certain: those who embrace change will survive, and those who place the interests of their customers ahead of themselves will thrive. The Canadian experiment is worth watching.