

# RBC Dominion Securities

## Special Market Commentary

Portfolio Advisory Group

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### The Magic of Diversification

#### Why Diversify?

There are many terms in the world of finance that get thrown around with reckless abandon, but often have very little meaning when the rubber hits the road. One of the most common culprits is the term “diversification”, which has largely been the investment mantra since time began. Unfortunately, diversification is often misconstrued as simply meaning “own a lot of stocks”, which ignores the fact that owning lots of different securities does not necessarily make one diversified. Rather, the key to diversification is to own a group of securities that at least in some way behave differently from one another. That is, what is good for one security might not be good for another and vice versa. To best explain how to properly diversify, we must bring to the fore some financial concepts. We will attempt to do this in layman terms, as one can get bogged down in mathematical minutia when studying financial terminology and we are neither mathletes nor do we assume that our audience is. That said, the following might be best read with a strong cup of java.

#### What is Correlation and why does it matter?

When two assets are highly correlated to one another, they will tend to move in the same direction. Correlation is measured between -1 and +1, with anything close to 1 suggesting that two assets are highly positively correlated (i.e. they will tend to move together), anything approaching zero suggesting that the assets will tend to move independently of one another and anything close to -1 suggesting that two assets are highly negatively correlated (i.e. they will tend to move in opposite directions). For example, the big six banks in Canada are very highly correlated to one another (around 0.80), which is probably not all that surprising to most.

Now before we can hammer home the importance of correlation in creating the optimal portfolio, we need to bring in two more concepts: expected return and standard deviation.

#### Expected Return

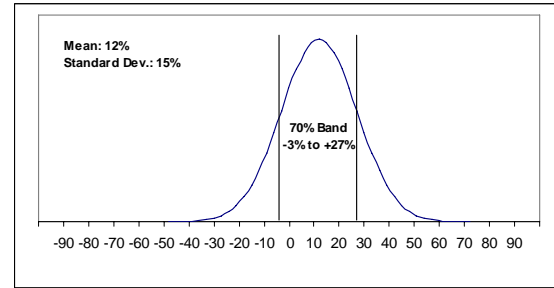
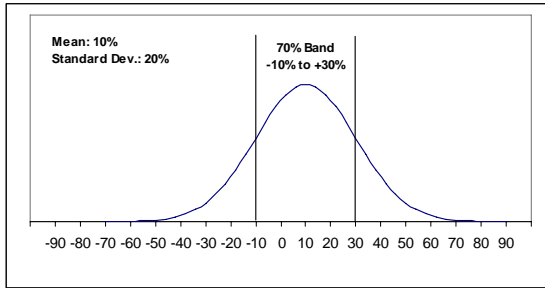
Embedded within owning a stock or a group of stocks is an expected return based on a vast array of probabilities and outcomes. Simplistically, if we buy a stock for \$10 that we believe has a 20% chance of being \$8 one-year from now, a 60% chance of being \$10 and a 20% chance of being \$20, then the stock has an expected value of \$11.60 ( $20\% \times \$8 + 60\% \times \$10 + 20\% \times \$20$ ) or an expected return of 16%. Now, we could be wrong about the probabilities and the outcomes, so expected return says nothing about actual return, but when we buy a stock or stocks, we are consciously or unconsciously embedding an expected return in the purchase. Intuitively, when we buy a stock with higher perceived risk, we must be embedding a higher expected return in order to compensate us for the higher perceived risk. To get a better measure of this risk, we can bring standard deviation into the analysis.

#### Standard Deviation

Standard deviation measures the dispersion of returns around a mean (average). To translate this into plain English (or at least into something resembling plain English), standard deviation measures how volatile a stock or a portfolio of stocks is expected to be based on past performance. The higher the volatility, the more risky a stock or portfolio of stocks will be and vice versa.

For example, let's assume that we own a portfolio of stocks that has an expected one-year return of 10% and a one-year standard deviation of 20%. This would be statistical speak for “roughly 70% of the time, the return on our portfolio will be in a band of 10% + or - 20%, which equates to a range of -10% to +30%. Now, there is often a trade-off between the size of the expected return and the width of the band around it. The goal of a diversified portfolio is to maximize this trade-off. For example, the two diagrams below show two different portfolios, one which has an expected return of 10% and a standard deviation of

20%, the other which has an expected return of 12% and a standard deviation of 15%. Notice that the second portfolio would be superior to the first, as it has both a higher expected return and less risk.



Thus, one intuitively might see that if we can increase expected return, while also decreasing the portfolio's standard deviation, we could potentially do some pretty fantastic things to the future returns of our portfolios. But is this possible?

### Risk-Adjusted Return and Correlation

Armed with a cursory understanding of expected return, standard deviation and risk-adjusted return, we can now bring correlation into the analysis. Essentially, as we bring more stocks into a portfolio that have a low correlation to the stocks that we already own, we lower the overall standard deviation of the portfolio, even if the stocks that we are adding have a higher standard deviation (individual risk) than the portfolio. How is this possible? Again, correlation approaching zero means that the performance of one asset will tend to have little relationship to the performance of another, so as we add low or even negatively correlated assets to a portfolio, the expected returns are essentially smoothed out (i.e. standard deviation of the overall portfolio drops).

### To Bank or not to Bank

One of the dangers of the idea of diversification is thinking you are diversified simply because you own a lot of stocks. Diversification is really only achieved when the mix of stocks that you own at least have some lack of correlation to one another. For example, as we mentioned earlier, the Canadian banks are very highly correlated to one another (0.80), while they have a collective standard deviation of returns of about 25%. The energy sector has a much higher standard deviation (not surprising) at around 33%, so one might assume that adding an energy component to our bank-only portfolio would increase risk. However, the energy sector has a correlation of only 0.26 to the financials and thus when we add say a 30% component of energy to our bank only portfolio, the standard deviation of our portfolio actually drops to about 22% or more than a 10% reduction in overall portfolio volatility. Interestingly, since the beginning of 2007, the financials and energy stocks in Canada have moved in opposite directions on a given trading day nearly 40% of the time, which speaks directly to the low correlation between the two assets. Further, sectors such as materials and stocks such as Research in Motion (RIM) and Potash (POT) also tend to have very low correlation to the financials and thus despite their higher volatilities, can also lower overall portfolio volatility.

### Diversification and Black Swans

Black swan events are highly improbable outcomes that are hard to predict and beyond the realm of normal expectations. 9/11 is a primary example of a black swan event; while the housing meltdown in the United States is arguably a black swan event (hockey fans would argue that a Leaf's Stanley Cup would be a black swan event). The easiest and most effective way of protecting a portfolio from a black swan style event is to make sure that at least some of the stocks in your portfolio are uncorrelated to one another. Thus, when black swan events occur (e.g. oil going to \$140), the impact on your portfolio may be mitigated.

### What are some black swan events on the horizon?

We are obviously only kidding with the above question, as black swan events are by their very nature unpredictable. That said, we can ask some questions about our portfolios to make sure they withstand a rudimentary black swan test.

July 17, 2008

- What happens if oil goes to \$200 or more? Answer – diversification (i.e. own some oil stocks to offset weakness in rest of portfolio).
- What happens if oil goes to \$50? Answer – diversification (i.e. own some other stuff to offset weakness in oil stocks that are in your portfolio).
- What happens if bank stocks trade down another 20%? Answer – diversification (you get the point).

Can we withstand every black swan event? No, events like 9/11 are going to do serious damage to portfolios (at least in the short-term), but by making sure that we are properly diversified, we can insulate against most of them.

In final point on black swans, the Canadian banks are down about 20% year-to-date, which may not qualify as a black swan event, but it may feel like one. Despite this, the TSX is only off about 3%, which is, in a sense, a real world example of how proper diversification can insulate a portfolio against black swan style events, as the TSX has about a 30% energy component (not to mention a near 20% materials component, which also exhibits a low correlation to the banks).

## **Conclusion**

Two myths of investing are thinking you are diversified simply because you own a lot of securities and that riskier securities automatically increase portfolio risk. Rather, proper diversification is based on owning a collection of securities that at least moderately uncorrelated to one another. Further, riskier securities that have a low correlation to other stocks that we own can actually lower overall portfolio risk. Following a proper diversification discipline can not only smooth returns, but also better protect against unforeseeable risks that lurk on the horizon.

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July 17, 2008

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July 17, 2008