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# The Ultimate Risk Management Tool: Equivalent Risk

I was asked earlier this year by several elementary schools to teach the basic of trading to their gifted students; one of the students happened to be my eleven year old son, Sean. The students competed in a national stock trading contest that ran from mid-January through late April. The students could only be long stocks and each school had a team [since these were only the extremely gifted students at each school, the groups were small - 3 or 4 students per team on average]. I taught them a simple charting methodology [I called it Crayon Drawing, because it was based on market structure and simple lines - No indicators were used - though the use of strict money management was featured prominently each time we met. I refused to give them trade ideas, nor would I tell them where and when to get out, profit or loss; I would point them, using questions, to a line of reasoning that would allow them to find the answers they needed themselves. I am proud to say that three groups I helped all finished in the top ten in the country; the two in Illinois finished third and fifth [The school system in Arizona, where I now live, has not yet given me permission to release any information more specific - the Arizona team finished in the top ten as well].

My first impression? We should have ten and eleven year olds manage our retirement money! The three groups averaged a 12.4 percent non-annualized increase in the value of their trading account over that short period of time, using no leverage and only being able to be long stocks. They set their maximum risk to no more than twenty percent of their account on open positions - though they never approached this level of risk. One of the main tenets in my own trading and one of the things I insist on when I mentor other professionals is that stops are always in place, the moment a position is put on as well as logical profit targets. I taught this to the students and they practiced it religiously.

What made these students take to trading so quickly and seemingly easily? My slogan is 'Master your tools, Master Yourself.' I believe mastering yourself and your emotions about positions and money [greed and fear, the 'need' to make money] is the most difficult part of trading. I try to build simple tools to help take these emotions out of most trader's minds, but at this young age, though the students are truly enthusiastic, they are generally not burdened by these emotions: They have no house payments and all the other burdens so many adults have when they first begin to learn to trade. These young adults also have a 'clean slate'; they have not been bombarded with the unrealistic and even fraudulent claims so many vendors use when trying to sell their trading books, courses, software. To these students, this is just another skill, like long hand division or expository writing they have to master - though I dare say the students I helped seemed a bit more enthusiastic about learning to trade than learning long hand division!

My son really enjoyed the experience. Those of you that follow my writings here at MoneyShow and the presentations I give at Traders Expo know that Sean has been helping me update my hand drawn charts

for several years and made spotted several incredible opportunities that I managed for him [his sharp eyes and charting abilities led to a nice short crude oil position just above \$146 a barrel and a nice long position at \$35 a barrel]; it's safe to say his college fund his college fund is ready to go!

As soon as school was out this year, I got an unexpected request from him: He asked me when I started to learn about trading. Regular readers here or people that follow my writings on my web pages know that I was extremely lucky to have an older brother that loved to speculate in the commodities market. His interest in trading and a family friend that owned a large scrap yard in Chicago and traded to hedge his cash metals holdings led to me learning about charting and trading at Sean's age. Once I repeated the story to Sean, he immediately asked me if he could trade an account, like I did when I was his age. To be honest, I felt I owed him the same opportunity my brother gave me, so I offered him this opportunity:

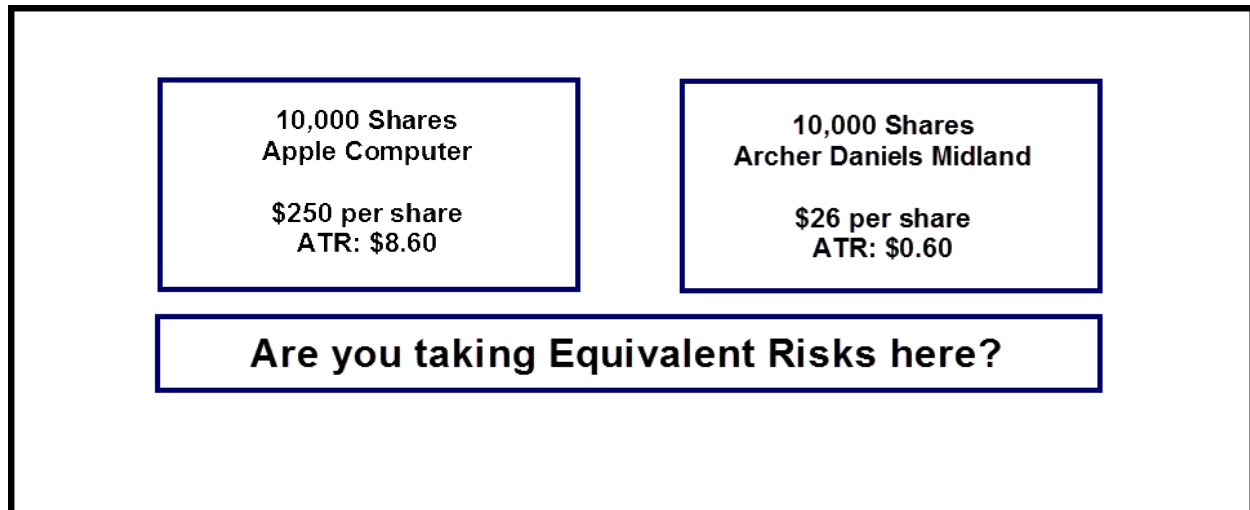
- He will trade a simulated account for a minimum of six months, though the depending on the results and how his ability to master essential skills, the trial may go longer.
- He may pass, he may fail. As I tell all my students, the profession 'trader' is not stamped on your birth certificate. The key, in my opinion, is whether he can master himself.
- IF he passes the simulated account successfully, I will fund a small trading account, with a \$2,000 maximum stop out on the entire account - which is exactly how my brother started me out in commodities.

He's in the middle of his first simulated trade, and he came rushing into my office during one of my live Mid-Day Mentoring sessions to tell me he got filled on his entry, so several hundred people are now watching the results of his trade live, as he moves the stop orders closer; he is nicely profitable in this first trade and about to enter his first stop profit order today after the market closes.

But besides successful simulated trading, he has to learn and master what I consider to be important tools that will give him an edge in the marketplace. For example, over the weekend, we were updating weekly commodity futures charts and cash Forex charts. Of course, I never saw the question coming: 'Dad, can I trade futures and Forex in my simulated account?' I thought about limiting him to stocks but I teach everyone that the repeatable patterns you should be looking for and researching come in all markets and in all time frames. Since he is in middle school, I wouldn't let him focus on short-term trading, but I decided not to limit him to just stocks.

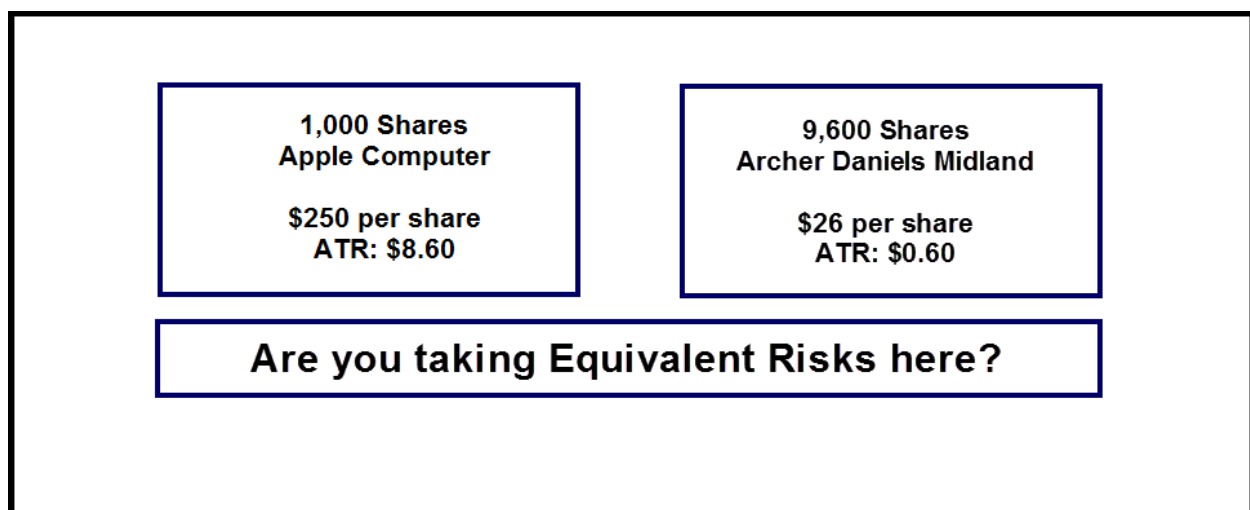
That opened a whole new set of tools and techniques for him to learn - but I like teaching and I have all the tools pre-built for my own trading. If he was going to trade stocks, futures and Forex, one of the first things I needed him to learn was the concept of equivalent risk; even if he only traded stocks, this is a very important concept that very few traders understand or utilize. Let's dig into this topic, using some simplified examples I put together for people that have only a basic understanding of spreadsheets [Like most people, I use Microsoft Excel].

Many retail traders trade in 'blocks', meaning that they always buy 100 or 1000 or 10,000 shares of whatever they are trading; if it goes up, they made money, if it goes down, they lost money. But is always trading the same amount of shares exposing their account to the same risk each time they take a trade? Maybe a simple image will make the flaw easy to spot:



This trader always buys or sells 10,000 shares of whatever he is interested in, regardless of price or the volatility of the stock. This trader IS trading the same number of shares each time he trades, but he IS NOT exposing his capital to equivalent risk.

The first thing that jumps out at most people when I say the trader IS NOT exposing his account to equivalent risk is the difference in price between the two stocks: 10,000 shares of Apple was worth about \$2.5 million US Dollars when this was written; 10,000 shares of Archer Daniels Midland was worth about \$260,000 US Dollars. The trader would obviously have much more capital invested in 10,000 shares of Apple compared to 10,000 shares of ADM. But that's easily fixed, right? What if the trader simply did the math so he invested in an equal 'face value' of each stock? Let's take a look:





Let's start out with an Excel spreadsheet and a handful of popular instruments: Apple Computer [a stock], GLD [The ETF for Gold], SPY [basically a closed-end mutual fund that allows you to buy and sell the stocks that make up the S&P 500 Index in one simple trade--it preceded the ETFs of today but functions about the same way], the CME E Mini 500 S&P Futures [the most popular stock index future traded in the United States, it basically mirrors the cash S&P 500 Index] and the Comex Gold Futures [the most popular futures contract based on the price of cash Gold listed on a United States Exchange]. Let's take this diverse list of instruments and examine different ways we might try to get to the point where we are exposing our account to similar if not equivalent risk when we take a position in any of these instruments. Let me re-state the idea: When we take a trade in Apple computer, we want to expose our capital to the same amount of risk when we take a position in Gold futures several days later. Some of you may still be wondering why we want to try to expose our account to similar risks each time we take a trade: If you have a wonderful day or week trading Apple Computer and then have a losing trade in Gold Futures, if you are using equivalent risk and a good risk/reward ratio [the importance of which I have written about many, many times], you should still have a very nice profit when you net the outcomes of the two trades.

**Equivalent and Non Equivalent Risk**

Equal Number of shares or contracts and the dollars at risk for different instruments

	AAPL	GLD	SPY	E Mini S&P Futures	Comex Gold Futures
Current Price	250	122	108	1075	1250

Non Equivalent Risk?

Now that we have chosen a few stocks, ETFs and futures, what are there current prices? Does price relate to value?

We've already discussed this and the obvious conclusion is that the price of the instrument does not necessarily relate to its value, especially when comparing it to other instruments. Let's keep building our spreadsheet.

Equal Number of shares or contracts and the dollars at risk for different instruments						
	AAPL	GLD	SPY	E Mini S&P Futures	Comex Gold Futures	
Current Price	250	122	108	1075	1250	
Average True Range	8.60	2.00	1.80	18.00	20.00	

**NON Equivalent Risk**

**To calculate the Average True Range:**

Find the Higher of either the High of the Day OR the Low of the Prior Day, if price gapped lower; use whichever has a higher value.

Find the Lower of either the Low of the Day OR the High of the Prior Day, if price gapped higher; use whichever has a lower value.

Subtract the Highest Value from the Lowest Value and you will have the True Range of the Day.

The Average True Range is found by taking an average X number of days long of the True Range and is often used as a measure of the average distance traveled in a 'normal' day. It can and is often used as a proxy for the 'normal' volatility of any instrument.

Now we add our first measure of the volatility of each of the instruments we are going to compare. There are many ways to measure volatility and many ways to use these different measurements. For example, a very short-term trader may not be interested in knowing that there are occasionally 'out of character' spikes in price in the instrument he or she trades every five or ten years on weekly bars because they are focused on five minute bars [These events are called 'Black Swan' events and although most people believe these events occur about once every 100 years, the measurements simply predict that in the case of normally distributed data, roughly 1 in 22 observations will differ by twice the standard deviation or more from the mean, and 1 in 370 will deviate by three times the standard deviation. They are of much greater interest to portfolio managers or traders that hold positions over long periods of time. I use a longer term approach to calculating my measurement of risk and volatility, so I do take into consideration these 'third deviation' moves.]

But for this exercise, using a 20 period average true range is a good start for our volatility measurement of each vehicle. Begin with this measurement and you can always choose to replace it after you work with it for some time and learn about other methods and their strengths and weaknesses.

**Equivalent and Non Equivalent Risk**

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	AAPL	GLD	SPY	E Mini S&P Futures	Comex Gold Futures
Current Price	250	122	108	1075	1250
Average True Range	8.60	2.00	1.80	18.00	20.00
One Dollar Value	1.00	1.00	1.00	50.00	100.00

**NON Equivalent Risk**

These are the Dollar Point Values Assigned by the Exchanges

To do any calculations, we'll need to know both the current price of the instruments but also, the value of one dollar in a stock [of course, one dollar in the United States is worth one Dollar] or one point when trading futures [one point refers to a move from 1075.00 to 1076.00 in the E Mini S&P futures; it refers to the move from 1250.00 to 1251.00 in the Gold Futures]. These values are assigned by the exchanges.

**Equivalent and Non Equivalent Risk**

Equal Number of shares or contracts and the dollars at risk for different instruments

	AAPL	GLD	SPY	E Mini S&P Futures	Comex Gold Futures
Current Price	250	122	108	1075	1250
Average True Range	8.60	2.00	1.80	18.00	20.00
One Dollar Value	1.00	1.00	1.00	50.00	100.00
Maximum Stop Loss	2.50	2.50	2.50	3.00	2.50

**NON Equivalent Risk**

These are my own maximum stop losses used in my trading

I NEVER trade without entering an initial stop loss order into the market at the same time I enter my entry order; I want my capital protected at all times. I have a maximum size stop loss I use based on my research of the a combination of the volatility of the instrument, as well as how far each instrument can trade past market structure roughly 80 percent of the time and still return to the major trend. Some

people feel this is a redundant measure of volatility, but it is a number that relates to my own willingness to risk a certain maximum amount of capital for each instrument, based on its trading characteristics--do not confuse this with the average true range, for instance. I add the size and value of my maximum stop loss for each instrument I trade so I can compare what I am risking.

**Equivalent and Non Equivalent Risk**

**Equal Number of shares or contracts and the dollars at risk for different instruments**

	AAPL	GLD	SPY	E Mini S&P Futures	Comex Gold Futures
Current Price	250	122	108	1075	1250
Average True Range	8.60	2.00	1.80	18.00	20.00
One Dollar Value	1.00	1.00	1.00	50.00	100.00
Maximum Stop Loss	2.50	2.50	2.50	3.00	2.50
Dollar Risk on Position					

**NON Equivalent Risk**

Number of Shares	
Standard	10,000

**What are we risking when we trade?**

Now let's start building the calculations that will allow us to compare risk! I'll begin by assuming we are trading 10,000 shares of stock each time we make a trade or 10,000 futures contract. Let's see how that works out numerically.

**Equivalent and Non Equivalent Risk**

**Equal Number of shares or contracts and the dollars at risk for different instruments**

	AAPL	GLD	SPY	E Mini S&P Futures	Comex Gold Futures
Current Price	250	122	108	1075	1250
Average True Range	8.60	2.00	1.80	18.00	20.00
One Dollar Value	1.00	1.00	1.00	50.00	100.00
Maximum Stop Loss	2.50	2.50	2.50	3.00	2.50
Dollar Risk on Position	\$ 86,000.00	\$ 20,000.00	\$ 18,000.00	\$ 9,000,000.00	\$ 20,000,000.00

**NON Equivalent Risk**

Number of Shares	
Standard	10,000

= F13\*F11\*C16 = G13\*G11\*C16 = H13\*H11\*C16 = I13\*I11\*C16 = J13\*J11\*C16

**By trading 10,000 shares or contracts of each, we are not exposing our capital to equivalent risk, even if we just look at the 'face value' of the instruments traded.**

Just glancing quickly at the row marked 'Dollar Risk on Position' should be an eye opener for those of you that always trade the same number of shares each time you trade different stocks or trade the same number of futures each time you trade different futures. For example, if you trade 10,000 shares of Apple, using the ATR method, you are risking \$86,000 if you bought the high and sold the low of the day as projected by the ATR [this assumes you are not using stop loss orders to limit your risk or that your stop loss order is larger than the ATR projected move for the day]; if you traded 10,000 shares of the ETF GLD, you would be risking \$20,000. These risks are not equivalent and it gets even more striking if we compare the risk associated with taking a position of 10,000 shares of Apple stock and 10,000 E Mini S&P futures: You'd be risking \$86,000 on the Apple position and \$9,000,000 on the E Mini S&P futures position - that's an incredible difference in risk!

I'm not suggesting the majority of traders or even a few traders are out there trading 10,000 shares of Apple stock and making the assumption that they are taking the same risk when trading 10,000 E Mini S&P futures. But I am suggesting that the majority of traders have not done an exercise like this and really don't have any idea how the risk on each instrument they trade compares. And it is something each trader needs to know if they trade multiple instruments.

Equivalent and Non Equivalent Risk						
Equal Number of shares or contracts and the dollars at risk for different instruments						
		AAPL	GLD	SPY	E Mini S&P Futures	Comex Gold Futures
	Current Price	250	122	108	1075	1250
	Average True Range	8.60	2.00	1.80	18.00	20.00
	One Dollar Value	1.00	1.00	1.00	50.00	100.00
	Maximum Stop Loss	2.50	2.50	2.50	3.00	2.50
Standard	Number of Shares	10,000				
	Dollar Risk on Position	\$ 86,000.00	\$ 20,000.00	\$ 18,000.00	\$ 9,000,000.00	\$ 20,000,000.00
Equal Risk - How many shares or contracts do I trade so that I am exposed to equal risk (in Dollars)						
	Equivalent Risk ?					

So let's build a new set of calculations and see if we can come with something that approaches 'Equal Risk' for each instrument we trade, each time we take a position.

Equivalent and Non Equivalent Risk							
Equal Number of shares or contracts and the dollars at risk for different instruments							
		AAPL	GLD	SPY	E Mini S&P Futures	Comex Gold Futures	
	Current Price	250	122	108	1075	1250	
	Average True Range	8.60	2.00	1.80	18.00	20.00	
NON Equivalent Risk		One Dollar Value	1.00	1.00	1.00	50.00	100.00
	Number of Shares	Maximum Stop Loss	2.50	2.50	2.50	3.00	2.50
Standard	10,000	Dollar Risk on Position	\$ 86,000.00	\$ 20,000.00	\$ 18,000.00	\$ 9,000,000.00	\$ 20,000,000.00
Equal Risk - How many shares or contracts do I trade so that I am exposed to equal risk (in Dollars)							
Equivalent Risk		Maximum Stop Loss	2.50	2.50	2.50	3.00	2.50
10,000 Shares of Apple as Standard Measurement			10,000				
		ATR*Dollar Value*Max Stop	21.5	5	4.5	2,700	5,000
Let's build a standard measure of risk to use in these calculations:			=F11*F13*F15	=G11*G13*G15	=H11*H13*H15	=I11*I13*I15	=J11*J13*J15

By taking the ATR of an instrument and multiplying it by its Dollar value or One Point Value and the maximum stop loss I am willing to use for that particular instrument, we can easily generate a standard measurement of risk for each instrument; we can then use that standard risk measurement to compare the 'riskiness' of one instrument as it compares to others. Are there other ways to measure the risk of an instrument? Yes. This is meant as a beginning example and is actually quite useful, as simplistic as it is, but feel free to explore and use other measures of risk or volatility.

Now let's build a table around this standard risk measurement and see if we can work our way to actual equivalent risks across these instruments.

Equivalent and Non Equivalent Risk							
Equal Number of shares or contracts and the dollars at risk for different instruments							
		AAPL	GLD	SPY	E Mini S&P Futures	Comex Gold Futures	
	Current Price	250	122	108	1075	1250	
	Average True Range	5.00	2.00	2.80	18.00	20.00	
NON Equivalent Risk		One Dollar Value	1.00	1.00	1.00	50.00	100.00
	Number of Shares	Maximum Stop Loss	2.50	2.50	2.50	3.00	2.50
Standard	10,000	Dollar Risk on Position	\$ 50,000.00	\$ 20,000.00	\$ 28,000.00	\$ 9,000,000.00	\$ 20,000,000.00
Equal Risk - How many shares or contracts do I trade so that I am exposed to equal risk (in Dollars)							
Equivalent Risk		Maximum Stop Loss	2.50	2.50	2.50	3.00	2.50
10,000 Shares of Apple as Standard Measurement			10,000				
		ATR*Dollar Value*Max Stop	21.5	5	4.5	2,700	5,000
Equivalent Risk Adjusted Number of Shares/Contracts			10,000	43,000	47,778	80	43
			=E2*F26	=F27/G27*F26	=F27/H27*F26	=F27/I27*F26	=F27/J27*F26

By using the standard risk measurement, we are now able to use a simple formulae to come up with similar or 'equivalent risks' when taking positions in any of these instruments. This table assumes that the standard position used to determine the position size in any of the other instruments is based on 10,000 shares of Apple, but you could easily change the number of shares or even change the standard from apple computer to any instrument [for example, I use U.S. 30 Day Treasury Bills as my 'standard unit' and compare the riskiness of all other instruments to 30 Day T-Bills].

Note I purposely shared the Excel formulas when making calculations; and as I have said several times, this worksheet is meant as a starting point for each of you. To get a real feel for the relatively volatility of the instruments you trade, I urge you to re-create this spreadsheet, with the instruments you actually trade - or you can simply use the instruments I have used and practice your excel skills. But if you have the ability to get the current 20 day ATR for each instrument, when you create your own copy, use the current ATR and don't forget to use your own maximum stop loss sizes!

I hope you find this exercise interesting. Many of you may have never thought of looking at your position sizes using this type of tool - give it a try! Some of you may have better tools for comparing the volatility of instruments - If so, please feel free to drop me an email and share your thoughts, questions and criticisms.

I wish you all good trading.