Dow Theory On Steroids:

Relative Strength System with Dow Theory for the 21st Century filter

What happens when one mixes a great timing indicator like the Dow Theory for the 21st Century (DT21C) with a relative strength system? Answer: **Even more outperformance and a better risk-reward profile *v*. Buy and Hold (B&H).**

Relative Strength (RS) is based on the proven fact that assets (stocks, indexes, sectors, commodities, etc.) that have displayed strength relative to other peers should continue to be relatively stronger in the future. RS is not trend-following, as one relatively stronger asset may be falling, albeit less than its coequals. This is the weak point of RS investing. RS tends to outperform in Bull markets but gets decimated in Bear markets. For many RS systems, the risk-adjusted profile is not better than Buy & Hold due to large drawdowns during Bear markets.

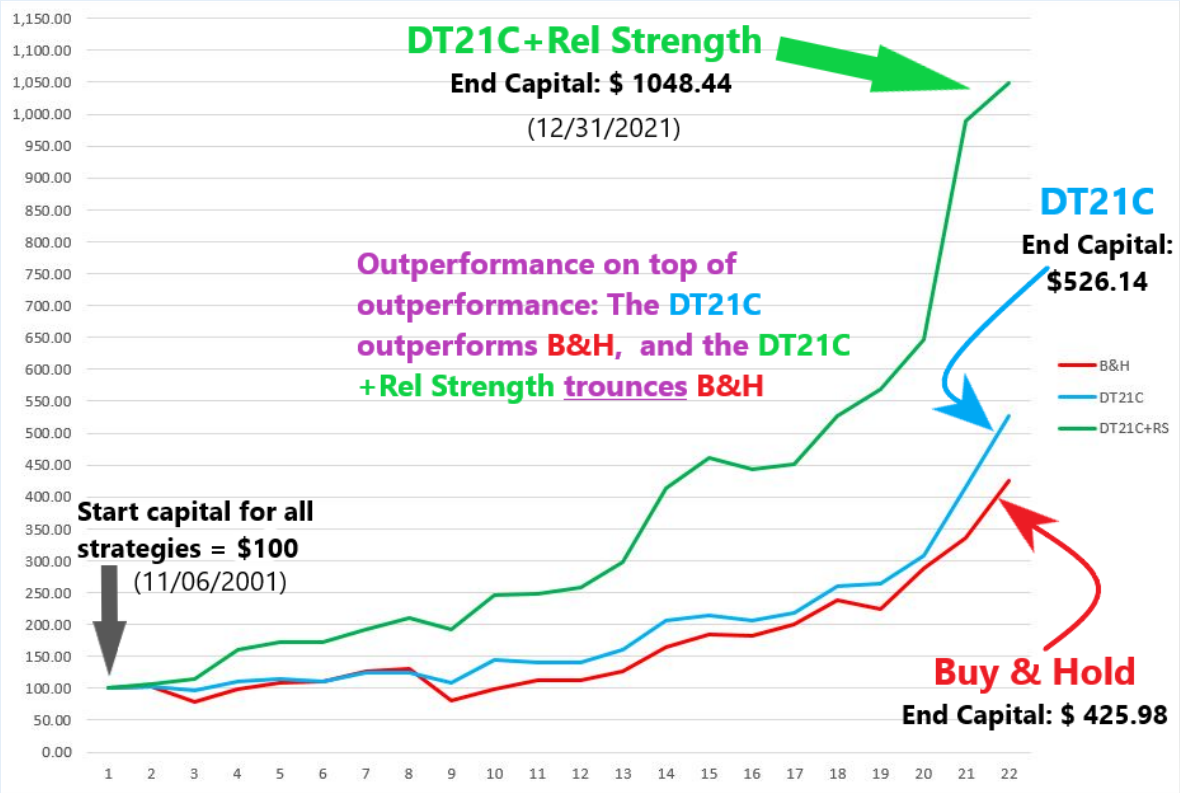
What if we could get the upside of RS while getting rid of the downside? If we used RS only in Bull markets and exiting stocks during downturns, we would be getting the best of both worlds: Catching the RS's outperformance in good times while avoiding the bad times.

We know that the DT21C is one of the best trend-following devices. If unconvinced, read the following Special Report penned by Gillen Markets:

https://thedowtheory.com/subscriber/special-reports/dow-theory-for-the-21st-century-a-third-party-examination/

Thus, if we applied an RS strategy to equities only when the DT21C is in a BUY mode, we would have greater odds of achieving significant outperformance, as we'd have **two sources of outperformance**: the DT21C, and **additionally**, the one derived from the RS strategy.

However, there are many RS strategies. Some are good and robust. Some are not. After carefully researching the issue since 2015 and testing the waters with my own accounts, I came to what I consider one of the "best" and most robust RS systems. The **test starts on 1/06/01 and finishes on 12/31/21**, ca. 21 ½ years. Take a look at the key charts and figures:



Below there is the performance breakdown for each year from 2001 to 2021:

		S&P 500 level	B&H		DT21C		DT 21ST+RS		Outperf. DT+RS
11/06/01	Start test Buy	1118.86	100.00		100		100		vs. B&H
12/31/2001	Year end	1148.08	102.61	2.61%	102.611587	2.61%	107.229602	7.23%	4.62%
12/31/2002	Year end	879.82	78.63539674	-23.37%	96.2254295	-6.22%	115.613181	7.82%	31.18%
12/31/2003	Year end	1111.91	99.37883203	26.38%	110.471261	14.80%	160.304463	38.66%	12.28%
12/31/2004	Year end	1211.92	108.3173945	8.99%	114.500899	3.65%	172.357459	7.52%	-1.48%
12/30/2005	Year end	1248.32	111.5707059	3.00%	109.793633	-4.11%	172.861092	0.29%	-2.71%
12/31/2006	Year end	1418.3	126.7629552	13.62%	124.743903	13.62%	192.974287	11.64%	-1.98%
12/31/2007	Year end	1468.29	131.2308957	3.52%	125.468637	0.58%	210.533798	9.10%	5.57%
12/31/2008	Year end	903.25	80.72949252	-38.48%	108.480415	-13.54%	193.062609	-8.30%	30.18%
12/31/2009	Year end	1115.1	99.66394366	23.45%	145.464876	34.09%	246.088236	27.47%	4.01%
12/31/2010	Year end	1257.64	112.4036966	12.78%	140.070823	-3.71%	248.200206	0.86%	-11.92%
12/30/2011	Year end	1257.6	112.4001216	0.00%	140.971896	0.64%	257.198804	3.63%	3.63%
12/31/2012	Year end	1426.19	127.4681372	13.41%	159.870157	13.41%	297.874001	15.81%	2.41%
12/31/2013	Year end	1848.36	165.2002932	29.60%	207.193714	29.60%	413.489081	38.81%	9.21%
12/31/2014	Year End	2058.9	184.0176608	11.39%	214.404744	3.48%	460.987659	11.49%	0.10%
12/31/2015	Year end	2043.94	182.6805856	-0.73%	206.940651	-3.48%	443.493158	-3.80%	-3.07%
12/30/2016	Year end	2238.83	200.0992081	9.54%	217.524268	5.11%	450.656401	1.62%	-7.92%
12/29/2017	Year end	2673.71	238.9673418	19.42%	259.77712	19.42%	527.152754	16.97%	-2.45%
12/31/2018	Year end	2506.85	224.0539478	-6.24%	264.251109	1.72%	568.242799	7.79%	14.04%
12/31/2019	Year end	3230.78	288.7564128	28.88%	308.410606	16.71%	646.694546	13.81%	-15.07%
12/31/2020	Year end	3756.07	335.7050927	16.26%	414.634047	34.44%	990.075988	43.60%	27.34%
12/31/2021	Year end	4766.18	425.985378	26.89%	526.140488	26.89%	1048.44087	5.89%	-21.00%

Key performance figures:

	BUY & HOLD			DT21C			DT21C+RS	
A	Avg	8.62%		Avg	9.03%		Avg	12.28%
B	StdDev	16.86%		StdDev	13.79%		StdDev	14.02%
C	Avg/Stddev	0.51		Avg/Stddev	0.66		Avg/Stddev	0.88
D	Avg-1Std	-8.25%		Avg-1Std	-4.75%		Avg-1Std	-1.74%
E	**CAGR**	**7.09%**		**CAGR**	**8.17%**		**CAGR**	**11.75%**
F	Neg. Years	4		Neg. Years	6		Neg. Years	2
G	Max Loser	-38.48%		Max Loser	-13.54%		Max Loser	-8.30%
H	Total win	249.75%		Total win	186.06%		Total win	270.00%
I	Total loss	-68.82%		Total loss	-30.42%		Total loss	-12.09%
K	**Profit factor**	**3.63**		**Profit factor**	**6.12**		**Profit factor**	**22.33**

I calculated the profit factor (PF, total profits made divided by total losses, see row "K" above) by computing the yearly percentage changes for each strategy and adding the total percentages of points won (row "H") or lost (row "I"). We see that the DT21C almost doubled the PF of B&H (6.12 *v.* 3.63). The DT21C+RS scored an astounding PF of 22.33, which means that we made much more than we lost, and, more importantly, a high degree of accuracy at spotting trends. We can also observe that by using a good trend filter (the DT21C), we get rid of the drawback plaguing RS systems: huge drawdowns during bear markets. If you look at the "Total Loss" cells (row "I" above), you'll see that the DT21C has a smaller total loss (as expected in good trend-following) but the DT21C+RS had an even more minuscule total loss of -12.09% percentage points over the last 21 years. In other words, by mixing RS with the DT21C, we increased performance, but we did not increase drawdowns. Given its propensity to significant drawdowns during bear markets, this is quite a feat when dealing with an RS strategy.

One approximation to a risk-adjusted measure of performance is to divide the average annual performance (row "A" above) by the annual standard deviation of such performance (row "B"). B&H scored a decent 0.51 (it's been a secular bull market after all), the DT21C had a better reading of 0.66 (it was better on both counts: more performance and less volatility). The DT21C+RS system scored an exceptional 0.88 (row "C"), which implies that we are increasing performance and decreasing risk. Another way to measure whether we are doing an excellent job at keeping drawdowns at bay is to subtract one standard deviation of the annual returns from the average annual returns themselves (row "D"): The less negative the number, the lower the odds of enduring a big drawdown in the future.

Row "E" shows the Compounded Annual Growth Rate (CAGR). As expected, it is higher for the DT21C and much higher for the DT21C+RS. Please remember that CACR gives us a more accurate performance measure than the average annual return (row "A"). However, measuring the average yearly return is helpful in order to relate it to its standard deviation to appraise risk.

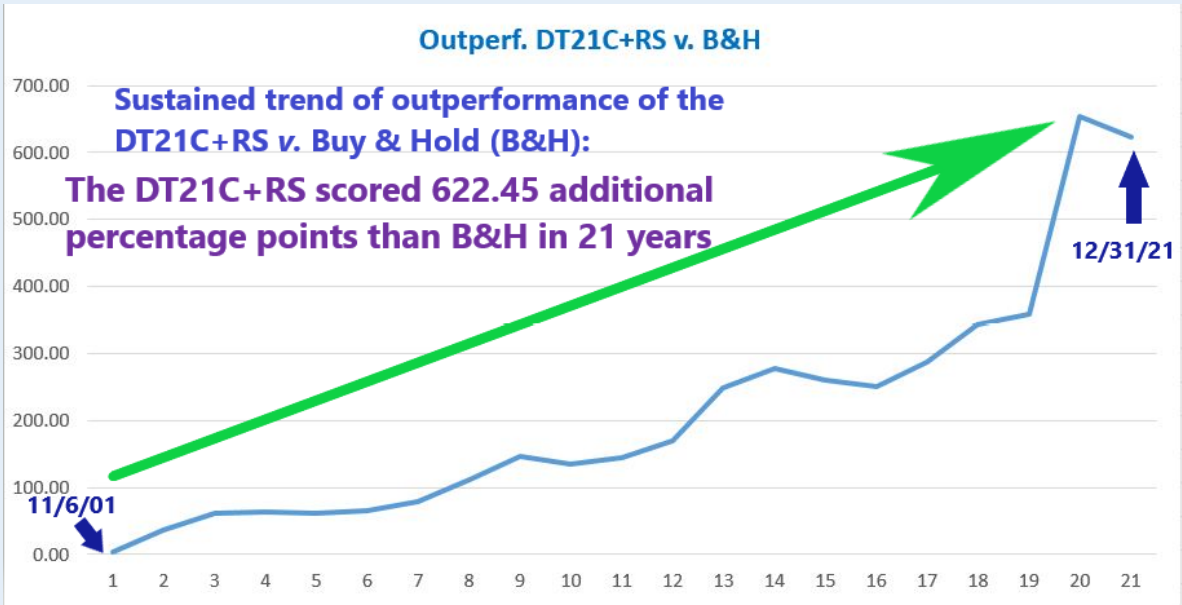
The DT21C+RS system only had two modest negative years (row "F"). B&H had four negative years. The worst annual performance ("Max Loser," row "G") was -38.48% for B&H, a very decent -13.54% for the DT21C, and an **outstanding -8.30% for the DT21+RS**.

So despite being an RS strategy, we managed to reduce drawdowns significantly thanks to the use of the DT21C trend filter.

The correlation coefficient of the annual performance of B&H *v.* The DT21C is 0.789. Given that the DT21C was tested on the S&P500, we see that the DT21C is not so correlated to B&H, which makes itself evident by slightly underperforming when the market is strong and overperforming when the market falls. The **correlation between the DT21C+RS and B&H is more interesting, dropping to a more modest 0.618**. Thus, adding the RS element to the DT21C provides an **additional layer of diversification**. We are achieving more outperformance and decoupling ourselves from the vagaries of B&H.

Watch out! There is no holy grail in the markets. We are not going to have the wind at our backs all the time. While over the long term, DT21C+RS beats the pants of B&H, there are rough patches that we have to overcome psychologically. Out of 21 years tested, DT21C+RS outperformed B&H for a total of eleven years. However, B&H defeated the DT21C+RS ten years. So there is an almost 50% chance that in any given year, we will be underperforming. Furthermore, there have been two episodes of 3-years-in-a-row of underperformance. The good news is that underperformance is not a lack of performance, and our DT21C-RS system fared well during the underperforming years but less than B&H.

The chart below shows the cumulated outperformance of the DT21C+RS versus B&H:



As you can see, the uptrend of outperformance is clear. Furthermore, you may observe that the periods of underperformance (blue line going down) are short-lived and moderate. In other words, the DT21C+RS will spend less time underperforming B&H than the DT21C or RS alone. This insight is vital as time underperforming B&H wears out the investor's patience. The shorter we keep the time underperforming B&H, the more likely we will stick to our trend-following system in real life.

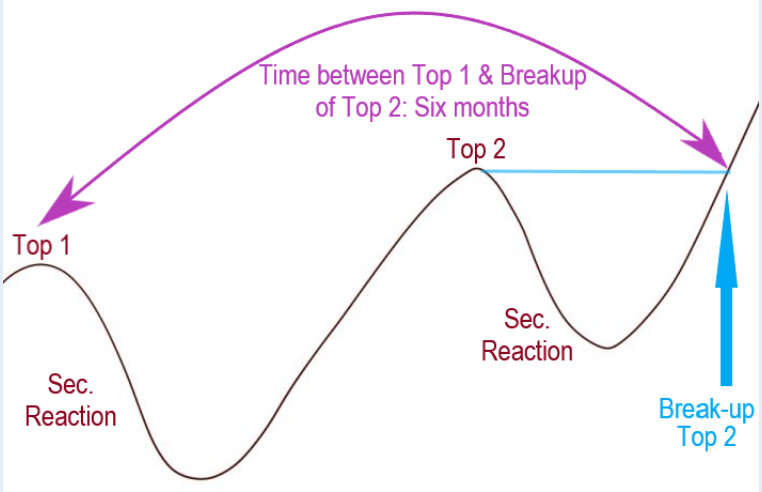
We explain below the most salient features (opening the black box):

1. **It is Dow Theory-based.**

By this, we mean that:

(a) **the trend filter is the DT21C**. When the Dow Theory issues a Sell signal, we close all positions, no questions asked. When the Dow Theory signals a Buy, we rank and choose the strongest equities ETFs.

(b) **our lookback period is based on the ebbs and flows of the secondary reactions determined by the DT21C**. To rank, you need to define the lookback period. Most RS strategies use a predetermined period (i.e., six months, one year). While any period exceeding 2-3 months seems to do well in backtesting, I feel uncomfortable with strategies that rely on fixed parameters. I think that the lookback period for ranking should be based on the natural ebb and flow of the markets. The DT21C is particularly well suited to define lookback periods based on such oscillations. Each time there is a secondary reaction against the Bull market, I look for a breakup of the last highs before the onset of the secondary reaction. Once I get the breakup, I look for another high point some months back. It can be as short as 2-3 months or as long as almost 12 months. It depends on the specific tops.

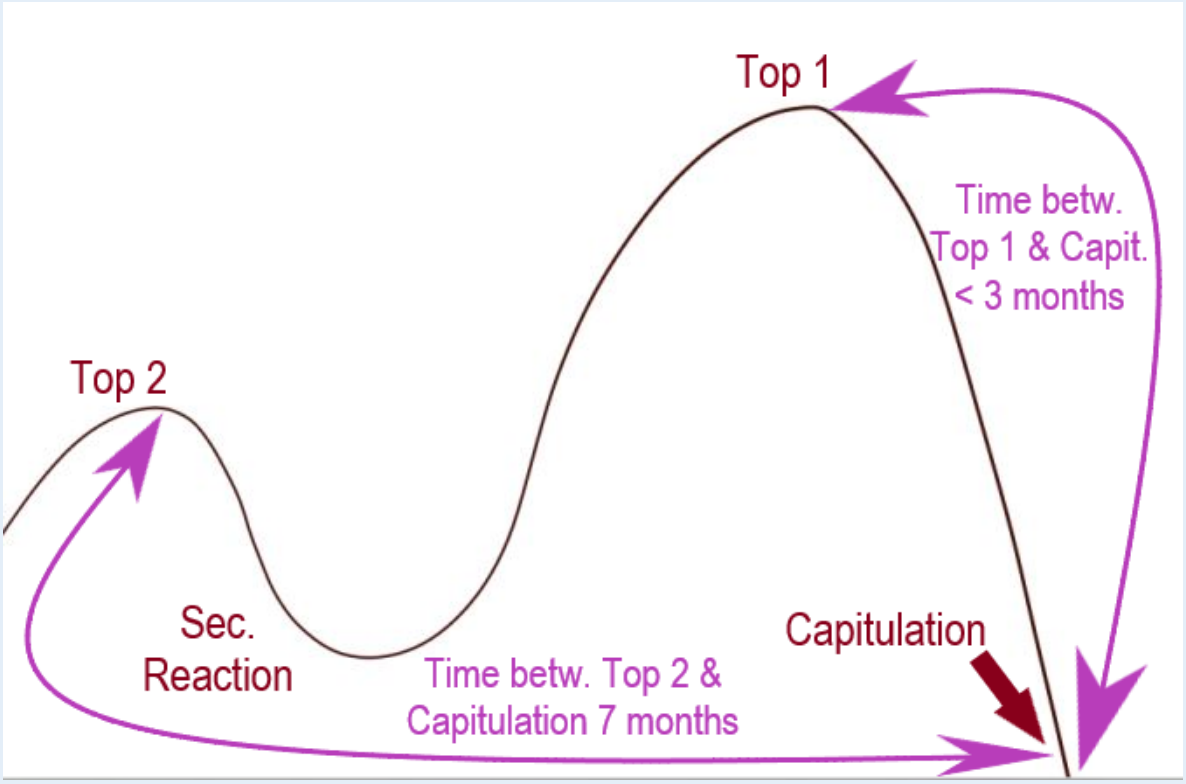


The chart on the left shows an example of how I proceed with the ranking. There is a bull market. Following Top 1 (left), a secondary reaction follows. A new rally betters Top 1, and Top 2 is made, after which a new secondary reaction ensues. An additional rally breaks up above Top 2. On the breakup day, we measure the time between Top 2 and the breakup day. If it is less than two or three months, we ignore it and look for the preceding Top (Top 1) in order to find a lookback period larger than two or three months and less than 12 months. In our example, the time between Top 1 and the breakup of Top 2 is six months, which is an acceptable value for our lookback period.

All in all, our lookback period is not fixed and "adapts" itself to the market cycles as determined by the DT21C. It gives us confidence as we are not cherry-picking an ideal lookback period.

By way of exception, we don't wait for a breakup when we get Capitulation. We take the day before Capitulation day and some previous top at least two or three months away. As you can see in the chart below, Top 1 is too close to Capitulation (less than three months), so we look for the previous top. Top 2 was made seven months before Capitulation, an acceptable

lookback period for ranking. If Top 1 had occurred at least three months before Capitulation, we'd have taken it for our ranking purposes.



There **is no lag between the ranking date and the day we take the trade**. When applying RS to stocks, it is advisable to rank approximately 22 trading days (1 month) before the current date[1]. This is done to avoid including severely overbought stocks susceptible to a correction. It has been documented that this is not necessary when trading ETFs. Furthermore, my tests led me to conclude that allowing some lag was slightly detrimental to performance.

3. It is based on ETFs.

Using ETFs instead of individual stocks has several advantages:

Research shows that RS applied to stock sectors delivers the same amount of profits as an individual stock strategy. Furthermore, the risk of steep drops which frequently plague stocks is more mitigated with ETFs. A negative earnings surprise may obliterate one stock but may hardly make a dent in a sector ETF. Similar conclusions apply to style investing (growth, momentum, and value).

[1] The so-called "short-term reversal" affects particularly low turnover stocks. High turnover stocks do not require skipping the last month and, by implication, ETFs. More here: https://alphaarchitect.com/2022/06/short-term-momentum/

There are many ways to implement an equities ETF-based RS portfolio. At the risk of oversimplifying, I see **two prominent "families**." One is the so-called "**style**." The other one is "**sectors**".

Let's start with "styles". There are three investing "styles": Value, growth, and momentum investing. Sometimes growth shines (as in 2021), and sometimes value takes revenge. Now and then, momentum trounces both growth and value, other times (usually near or at bear markets), it fails miserably. There are three subsets within each "family": Small, medium, and large-cap. Thus, specific market junctures will favor a combination of both capitalization and style (i.e., small-cap growth poised for larger returns). We named our "style" strategy **GVM**, for "growth, value, and momentum".

We use the following ETFs in our "style" strategy: **IJJ, IJS, IJT, IUSV, IVW, IWP, PDP, XMMO, XSMO.**

Our "style+Cap" portfolio (GVM) is just one choice among many others. One could settle with just three ETFs and ignore capitalization. Or three style ETFs plus a broad market ETF like SPY. Or conversely, one could choose capitalization and ignore the style. There are many combinations, and for all of them, relative strength works. We wanted to have at least 9 ETFs so that we have a higher probability of catching a real strong ETF. Value may have the highest relative strength at a given moment. However, upon deeper examination, large-cap value may be the strongest of its value peers. **Allowing for more granularity in our ETF selection, results in higher outperformance, albeit, occasionally, larger drawdowns**. We have mitigated the risk of an occasional big loser by:

(a) using the DT21C trend filter to weed out Bear market and even severe corrections;

(b) diversifying with a "sector" portfolio and not allocating 100% of our equity to the "style+Cap" portfolio.

We allocated 50% of our equity in our test to the GVM ("style+Cap") portfolio. We rank and **take the top 1 ranked ETF**. If we took the top 2 or 3 ETFs, GVM would also work as well, although with a smaller outperformance.

The **second "leg"** of our DT21C+RS strategy is based on **"sector" ETFs** (i.e, healthcare, Tech-software, etc.).

Our universe is based upon the following ETFs:

EPP, EZU, IBB, ICF, IDU, IGE, IGM, IGN, IGV, ILF, IYC, IYE, IYE, IYG, IYH, IYJ, IYK, IYM, IYR, IYW, IYZ & SMH.

As you can see, our "sector" universe includes ETFs that are not strictly sectors, like Latin America (ILF) or Europe (EZU). By doing this, we also gain international exposure when these regional markets (seldom) get stronger than US equity markets.

We take the top 3 ranked "sector" ETF, and allocate the remaining 50% of our equity, which amounts to 1/6 of our total equity to each ETF.

4. No survivorship bias.

One drawback with backtesting specific stocks is survivorship bias. The stocks available in most backtests are, by definition, those that survived the past, resulting in over-optimistic results. There are specific databases that have point-in-time data. However, backtesting stocks is prone to errors (splits, etc.). As explained above, one can obtain similar performance using sector or style ETFs. So we decided to take it easy. Time is in short supply.

We made sure that all ETFs existed during the period tested. The only exception is the momentum ETFs (PDP, XSMO, XMMO), which became available some years into the test. Thus, the first years of the "style" GVM portfolio were tested without such ETFs, so we had fewer ETFs to choose from. Our results would probably be marginally higher if we had had the nine ETFs of the GVM portfolio since the start of the test.

5. Buying, rotating and selling rules.

For buying, we take the top 1 ranked "style" ETF (for the GVM portfolio), and the top 3 ranked ETFs (for the sector portfolio).

When re-ranking after a successful breakup of a prior top, and unlike other RS systems, we get rid of any ETF that does not manage to remain among the top 1 (GVM) or 3 (Sector). To avoid excessive rotation due to frequent ranking, we know that many RS strategies allow some room for weakness (i.e., don't sell unless it is not ranked in the top 1/2). However, our strategy does not rank ETFs often (around three rankings per year), so we are willing to eliminate laggards as soon as an ETF falters.

Given that we base our system on breakups above past high tops that were punctuated by secondary reactions and that, on average, there are not more than three secondary reactions per year, we don't risk over-trading. Of course, it is not as easy as B&H or even following the DT21C. However**, ca. 3 trades/rotations per year is bearable, as it is not time-consuming and helps keep trading costs contained**. Since we deal in each trade or rotation with 4 ETFs (1 for GVM and 3 for sectors), we will be making around 12 round trades per annum (3 rotations x 4 ETFs). Our test says that the actual number of ETFs traded is below 12 since, in many re-rankings, the strong ETFs continue to be strong, and hence we don't rotate out of them.

We don't rebalance between GVM and Sector portfolios when re-ranking, namely when within the same Buy signal, a prior top has been broken up, and we produce a new ranking. **Example**: We get the first Buy signal. We allocate 50% to the GVM and 50% to the sector portfolio. After the first secondary reaction, there is a breakup above the last recorded highs. We rank again. GVM has grown 20% and Sector only 10%. We invest all the equity pertaining to GVM again in GVM. No rebalancing. Only when we get a Sell signal and go to cash, we rebalance the cash balances between GVM and Sector at the next Buy signal to

have the same amount of capital. My reluctance to limit rebalancing between GVM and style is based on keeping things simple. Those willing to keep volatility at bay may rebalance at every rotation and even earlier (i.e., bi-monthly).

When the DT21C triggers a SELL, all positions are closed and go to cash. In Section 8 below, we briefly explore other alternatives regarding what to do with cash during Sell signals.

The test was conducted on "pure price action"; no total return. So in actual trading, results should be slightly higher for all the strategies studied. We have not computed the interest received while being in cash. An ETF like SHY would be a proper place to park our money during Sell signals and earn a modest interest.

6. No risk of a crowed trade.

Our DT21C+RS system is just one among many variations. So there is little risk of the strategy becoming a crowded trade. What follows is an appetizer as to the many variations:

a) Change the lookback periods (i.e., instead of taking a previous top 5 months away, take another one eight months away),

b) Change the composition of the portfolio (i.e., changing the specific ETFs, simplifying the total number of sectors, making it more international, etc.),

c) Include within the main universe some bond and/or utilities ETFs (yes, occasionally, the best performing asset is a bond or utility ETF, notably when a bear market approaches)

Finally, as we explained in our January1st 2022 Letter, there is no average performance loss if we trade at the next day's open.

7. Test done by hand.

Among other reasons, the Dow Theory has kept its edge because it does not lend itself easily to being programmed. The same applies to our way of ranking the ETFs. Since we have a variable lookback period, all calculations must be done by hand. I only automated the ranking process, which was easy to code (start date/end date). Additionally, doing all the work by hand gave me an incredible feeling as to how the strategy performed under different market scenarios. Through a hand-made test, one gains much greater insight and confidence in the solidity of the trading system.

8. Suggested enhancements.

The DT21C+RS strategy is a very raw version (but it works beautifully). There are at least four ways to improve upon the "basic" version:

a) Most likely monthly or, at least, quarterly **rebalancing** would reduce volatility and likely increase performance. From my experience, some rebalancing might improve performance by ca. 0.20% annually.

b) If instead of buying the top ETF ranked sectors, one bought **the top 50% stocks that made the selected ETF**, we'd increase performance by getting rid of the bottom 50% stocks. My gut feeling tells me that one could gain an additional 1-2% p.a. by eliminating the worst-performing stocks within an ETF. Of course, doing this increases the amount of work, and likely commissions, as we'd have to trade many specific stocks.

c) Only **buy** the RS top ranked ETFs **provided there is insider buying** for the specific sector. If, for instance, the top 3 sector ETF has a worse insider buying reading than the top 4, then skip top 3 and buy the top 4. **Insider trading may add as much as 5% p.a. to a momentum based stock portfolio** (source: H. Nejat Seyhun, "*Investment Intelligence from Insider Trading*", MIT Press, page 302, Table 13.2).

d) **Use your money smartly when the system tells you to stay in cash**. When the DT21C signals a Sell, and we go to cash, one could switch to US bonds, provided they are in a bull market and you are willing to accept some more volatility in exchange for additional performance. An RS approach can also ascertain the specific bond(s). Our preliminary research shows an increase in performance and a slight increase in volatility. Under very well-defined circumstances (bull market in precious metals and bonds sagging), one could also make a small commitment to gold. We will further study the intelligent deployment of cash when the DT21C is in SELL mode.

9. How to use it.

I will be posting in each monthly Letter the status of the portfolio in one of my accounts, and we will be sending email alerts when a trade, as per the model portfolio explained in this Special Report (GVM+Sector) is being signaled. Use it as you want. As we said, this is just the basis for even more sophisticated approaches, and investors should find what suits them best.

Acknowledgments:

I am indebted to Jack Schannep, whose book, "The Dow Theory for the 21st Century" catapulted me into being a good long-term market timer. I am also grateful to Gary Antonacci, whose book "Dual Momentum Investing", and webinars opened my eyes to the synergies derived from mixing relative strength with trend following. Thanks, Jack! Thanks Gary!

References:

For the trend-following, DT21C element:

Jack Schannep, "*The Dow Theory for the 21st Century: Technical Indicators For Improving Your Investment Results",* John Wiley & Sons, 2008.

For the Relative Strength element:

Gary Antonacci, "*Dual Momentum Investing: An Innovative Strategy for Higher Returns with Lower Risk"*, McGraw Hill, 2015.

Andreas Clenow, "*Stocks on the Move: Beating the Market with Hedge Fund Momentum Strategies*", CreateSpace Independent Publishing Platform, 2015.

James P. O'Shaughnessy, "*What Works on Wall Street*", Chapter 15, McGraw Hill, 2005

David Vomund, "*ETF Trading Strategies Revealed*", MarketPlace Books, 2006.

Jackie Ann Patterson, "*Truth About ETF Rotation – Fund Your Retirement by Investing in Top Exchange Traded Funds in One Hour per Week*", Own Mountain Trading Company, 2017.

David Alan Carter, "*The 12% Solution*", CreateSpace Independent Publishing Platform, 2017.

Latest revision: March 31th, 2022