

At ARK Invest, the following or similar work would be helpful in determining advantageous times to acquire new assets.

### Basis:

From the *Image* below it's clear the ratio of areas  $A_u/A_l$  over some time interval  $a$  to  $b$  is given by (1).

$$\frac{\int_a^b dt[u(t) - f(t)]}{\int_a^b dt[f(t) - l(t)]} \quad (1)$$

or for unspecified  $t$ :

$$A_u/A_l \equiv A(t) = \frac{\int_0^t dt'[u(t') - f(t')]}{\int_0^t dt'[f(t') - l(t')]} \quad (1)$$



*Image:* Daily chart of a relatively volatile asset. The two  $l, l'(t)$ 's represent one way in which the following general theory could be refined & investigated.

### Assertion:

*The trend is more often broken when  $A(t)$  is in the **proximity** of 1. In other words, when the areas  $A_u$  and  $A_l$  are approximately the same.*

The definition of *trend* then follows:

$$u(t) > f(t) > l(t),$$

for a given interval. Multiple time frames and trends could be used in this analysis.

*Note:* I have essentially left all my thoughts and details out of this statement including: how it was framed, where it may be more useful, and strategies that could spawn off it if deemed to have significant validity. This was intentional and done with the hopes of encouraging further discussion, preferably via phone or in person, with the reader. This work sample was produced in an effort to make mathematical the patterns I seemed to be seeing more often than not. In my mind, *equilibrium* is a word that motivated the assertion above.

**Other Works:**

If any of the application has elicited interest thus far, I would encourage the reader(s) to briefly look at my Github page and Instagram Highlights (the stories on my profile). The job posting says a "tweetstorm" may be an example of my work. In this case, the Instagram highlights are my "tweetstorm," you will come to learn more about my thoughts and interests in a brief 1-2 minute look at them [@JackJHartmann] on Instagram. My Twitter account is given on the Github page—@JackHartmann.

I hope that who I am is weighted similarly to what I have done, and sensing the "who" can be accomplished by briefly viewing these highlights or past tweets.

The Github page shows some of my self taught coding abilities in the form of CSS and HTML using VS Code. A small feature of the page is some of my art work. Creativity is hard to gauge in someone digitally, so that is the only goal with its inclusion.

The final three work samples (examples) listed below are included on the Github page in the 'Trading Ideas' section. There is more explanation there than here but expressed less formally. The 'Ideas' section contains some of my thoughts on the interesting technology included in the Cover Letter.

**Verifiable Equity Conclusions:** The word *verifiable* is very important here. I'll assume the reader does not know what TradingView is; TradingView is a site you can post ideas on, but the most pertinent part of that is the user **cannot** delete their ideas. Hence, "verifiable." The reader will see that the only stock ideas on my TradingView are the three listed below. If bought at the time of my posting, the returns would be over one thousand percent. Feel free to reach out for my TradingView account so you may vet everything there. Again, this is also on my Github page, but TradingView is where you can verify its authenticity.

**Tesla: May 18th, 2019** Before the 15x cumulative stock splits, this work sample asserted that the "bear market" for Tesla was near its end. This was during the time of negative headlines and major banks calling for Tesla's bankruptcy and/or all out stock collapse. All I said in that post was, this is the last chance you have to buy Tesla stock at a [relatively] low price. The bottom of 180-200 USD was accurately foreseen on May 18th, 2019. Please ask for my TradingView account and I will provide it to you. The only reason I do not provide it right away is that in 2019 I did not expect to be using those works for my application. You must first show interest in me to get the full details of that account. It was clear to me then that the negative press seemed like a last effort for everyone who was short on Tesla then. Even those that were short knew the bright future of the company [and knew the stock troubles were nearing their end], or at least, that is what I felt to be happening.

**General Electric: October 15th, 2022** This work sample was motivated in part from the mathematical theory written about above. I said there that it was an attempt to make mathematical the patterns I was seeing.

It's convoluted to discuss stock price here because GE's long awaited health care spin off altered the pre-spinoff stock prices shortly after the idea was posted. However, the 6-month performance

of GE and the S&P 500 is +54% and +4.8%, respectively, as of noon on the 22nd of May this year.

**Carnival Cruise Lines: April 13th, 2023** This work sample includes a potentially unique side of how I see equities. Unlike GE and Tesla, I have no connection to Carnival in the sense that I like Tesla and GE products are everywhere from the kitchen to the plane I would take to move to St. Petersburg! Again, this is a summary of information, with the goal of discussing these work samples face to face or in person.

Carnival Cruise Lines seemed risky if it went below \$8.50 and a good buy at \$9.00 per share. Unlike the other two work samples, this is one I would want to sell when I'd see fit, and it is still ongoing. \$13.50 is a safe target. Again, there is so much more to these ideas that I won't divulge here. I would love to do so upon request.

The 1-month performance of CCL and the S&P 500 is +21% and +1.5%, respectively, as of noon on the 22nd of May this year.

**Summary:** I hope this was enticing so to grant further discussion. The ability to code, overlay mathematical theory to patterns, a sense of creativity, and perhaps most importantly a sense of who I am as a human (per the Instagram Highlights, tweets, etc) was shown. What I enjoy the most about the final three work samples is that for Tesla, it felt like Cathie Wood and myself were in a very small minority of Tesla Bulls in May 2019. There is more on my TradingView including a SPX Spring 2023 outlook [made in February and still valid today]. One could imagine this being used in work at ARK Invest to help guide or determine advantageous buying/selling times.

Final note: This is a job where I will go down rabbit holes and be doing work outside the workday, but *importantly* it will not feel like work. Professional sports players don't feel like they have a job, the best will tell you they are doing something they love and have fun doing. This is precisely how I see myself in this position, and my goal is to show that to ARK Invest. Thank you for your time.

**Physics Teaching Assistant** This will not be found on my website or social media pages as it is something I prefer to keep private. During the last week of class, 'my' students said they wanted a picture; I happily obliged. What made it extra special for me was that on the last day they gave me a large poster of the printed picture with kind words on the back. I won the TA award the following semester. I take pride in having a positive impact on all, or as many as possible, persons I encounter. ARK seems like a great place to build positive relationships in addition to work.



Jack - Thank you for being the best TA I could ask for! You always did your best to help us succeed (which was difficult at times) and I was very appreciative of all the times you showed the calculus behind it just for me. Keep being awesome! Jadyn

You're da best!  
Kee  
You is kind  
You is smart  
You is important  
- Doc M. Tran

Jack,  
Thank you for everything!  
I appreciate you and your constant words (and emails) of encouragement!  
-Hannah Alabadohan

Jack,  
thanks for literally being the best TA!  
You are literally the only reason I'm not failing right now.  
You're the best!  
-SAKINA

Jack, thanks for being such an amazing TA and making every lab and discussion day fun!  
Come out to coffee hall on Saturday on the third floor to watch our marathon and golf tournament!  
-David

A Jesus, You really glad i took his class, our teacher because it was the requirement. You were nice, patient and had really good TA's on there. I'm not doing well about it in the coming days. Also thank you for all the time spent working my major. It was really helpful and meant a lot. Thank you for being such a great TA. I will miss you next semester.

Jack,  
You're the best out of all the TAs I've had (only 2, 1 of them is you). Thanks for helping me out so much & being so supportive. Good luck on the MFT!!  
-Anish

Jack,  
thank you for everything this semester! I was not have been able to make it through physics without all your help. You are one of the coolest TAs I've ever had and I will miss having you for physics 21C & that marks out result! Thank you for everything and goodness with everything!! - lots of love you!!

Jack,  
I am so unbelievably thankful for whatever luck it was that put me in your lab section. I was so scared and overwhelmed the first few weeks of this semester, it didn't seem like I would ever succeed. However, thanks to your success, surpassed my greatest expectations. Thank you for being so amazing and getting all of us through this class in one piece, you're like a superhero.

-Maggie

Jack,  
Honestly, I've never had a better TA than you. You truly want us to do the best we can and are willing to help in any way possible. I am sure we are all so thankful for you and your big smile, support, and motto - "at the highest level". Thank you for everything!

-Maddy

Jack,  
Thanks for everything! We all had so much fun with you as our TA, and we really appreciate all your help! You passed b/c of you! Thanks for the music & nature docce, too! ☺

-Katie

Jack,  
Thank you for going above and beyond to make sure everyone in our section understands physics. You're the best TA we ever had. I hope we see you again next semester.

Jack,  
Thank you! Thank you for being the best TA ever. I hope we will still connect and work together again.

JACK,  
Literally don't know how I would have survived 300 without you. Hands down best TA I've ever had. Thank you for all your help this semester! Really trying to get in your section next semester - 100. Thank you again!

-Maddy

Jack, thank you for making physics enjoyable and being the best TA! I'm not sure how I would have made it without you. I'm so sad I won't have you as my TA next semester but thanks again for