HYDRODYNAMIC ANALYSIS OF SURFBOARD FIN PERFORMANCE

by

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HYDRODYNAMIC ANALYSIS OF SURFBOARD FIN PERFORMANCE

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ABSTRACT

Hydrodynamic Analysis of Surfboard Fin Performance set out to analyze how the outline of a surfboard fin can impact performance. Performance analysis involved running images from the manufacturers' website through a MATLAB code that would process the image and determine an appropriate numerical method based on fluid dynamics to explain categorical differences between fins. After testing for differences between categories for the following performance metrics: the vertical line of action, the horizontal line of action, the ratio between the tip area and the rest of the fin, and the resulting angle created by comparing the vertical and horizontal lines of action, the angle was found to be the most statistically significant factor for determining fin categories. Moving forward, users can input an image, along with the fin dimensions, to determine the performance characteristics of a fin without having to purchase a fin. This project explains the underlying equations that are utilized, the fundamental assumptions that are made, how the results are generated, and how users can interpret the results.

INTRODUCTION

In the Fall of 2020, I purchased a new surfboard that was a unique shape and had what was known as a 2+1 fin set up (Figure 1). This means that the board can either be ridden with either one, two, or three fins. After consulting with the shaper (the person who made the surfboard) they suggested that the best fin combination to try would be a two or "twin" fin set up.

Figure 1: Surfboard with a 2+1 fin setup

However, when I went to ride the board, I had very little control. I would start sliding during turns causing me to lose control and fall. I then changed the board to only one fin that was taller but had a smaller overall area than just one of the twin fins. The result was a board that did not experience any sliding and performed as intended.

The issue that I experienced is not one that is foreign to the surf community. While not every board can be ridden with different fin set ups, there is a large variety of surfboard fins that are available for each fin set up. Manufacturers will provide categorical information to describe a fin's performance characteristics or will try give the fin a rating on a scale of 1-10. On top of this, information is given about a fin's base, height, area, rake, flex, and material with the first three being given as quantitative data and the later three as qualitative data. Determining which set of performance characteristics are suited for a particular surfboard can require buying multiple sets of fins, with each set costing well over one hundred dollars. The result is that a market inefficiency develops where surfers end up purchasing surfboard fins that do not fit their needs and are forced to resell the fins at a considerable markdown on the used sporting goods market.

It should be noted that the goal of this project is not to identify an ultimate fin. A wide variety of fins exist to support a wide variety of board shapes, riding styles and preferences. Some people want to be able to turn quickly, while others enjoy traveling in a straight line at high speeds. Catering to the diversity of style that exists has resulted in a wide variety of fins with drastically different performance characteristics. Foil shape and flex are different for each surfboard fin and require physical testing to determine further physical properties. Purchasing hundreds of surfboard fins would not have been economically feasible, nor particularly wise at a landlocked university, so the project only focusses on the profile of a fin, as that information is provided to the consumer free of charge in the form of the product image. This project looks to use fluid dynamics to deliver a quantitative value that can explain the differences between a manufacturer's given categories for surfboard fins when controlling for size differences.

LITERATURE REVIEW

Two factors have the greatest impact on surfboard fin performance are drag and lift. Drag is the force that is produced in the direction of fluid flow and prevents motion in that direction, while lift is the force that is produced perpendicular to fluid flow. The equations for lift and drag are[1] [2]:

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[1] NASA Glenn Research Center, The Drag Equation

[2] NASA Glenn Research Center, The Modern Lift Equation

$$D = C_D * \frac{\rho * v^2}{2} * A$$

Drag Equation

$$L = C_L * \frac{\rho * v^2}{2} * A$$

Lift Equation

In both equations ρ is the fluid's density and v is the velocity of an object. For the drag equation, A is the cross-sectional area of the face of the object that is facing the fluid flow, and C_D is the drag coefficient, an experimentally determined constant unique to an object's 3-Dimensional geometry. In the lift equation, A is the wing area. The wing area is the cross-sectional area of an object along its chord line (or the line from the leading edge of the object to its trailing edge), when viewed from above[3]. Figures 2 and 3 provide visuals for both the cord line and the wing area, respectively. C_L is the lift coefficient. It is an experimentally determined constant unique to an object's 3-dimensional geometry (foil) and increases as the angle of attack (or angle between the direction of the fluid flow and the chord line) increases. *D* is the drag force and *L* is the lift force.

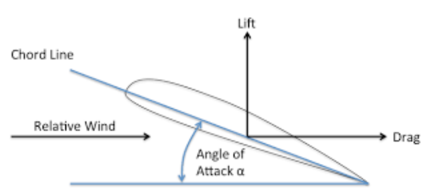

Figure 2: Chord Line and Angle of Attack of an Airfoil

[3] NASA Glenn Research Center, Wing Area

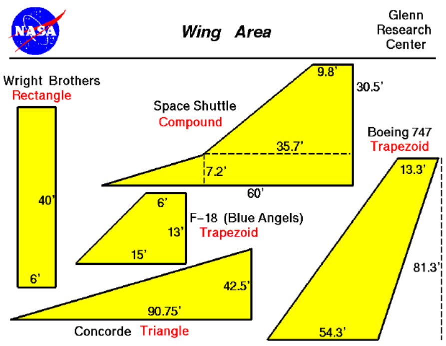

Figure 3: Wing Area of Various Airfoils

Drag is best visualized as the force produced by the fluid molecules colliding with the front surface of a fin, impeding movement. The cumulative force of the collisions is best represented by the drag equations.

Lift is a function of the airflow being split as it travels around an object. The fluid above the object begins moving at a higher velocity, resulting in a low-pressure region above the airfoil. The fluid below the object begins moving at a lower velocity, creating a high-pressure region below the airfoil. The pressure difference creates an aggregate force vector that is perpendicular to the fluid flow (Figure 4).

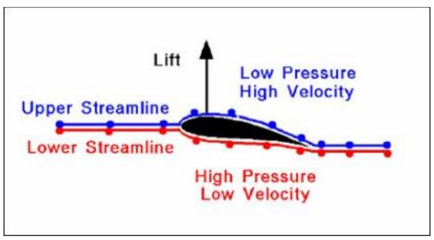

Figure 4: Production of Lift

Lift is valuable to surfing as it can be broken into 2 vectors, one that creates a forward force, accelerating the board forward and another acting perpendicular to the direction of motion, allowing for the board to be pushed against to turn. The angle of the lift vector is also function of the angle of attack since the lift vector is perpendicular to fluid flow. As the angle of attack increases, there is more forward propulsion (drive) and less perpendicular force (hold) as the angle increases (Figure 5). However, if the angle of attack becomes too great, turbulent flow will develop above the wing, causing the coefficient of lift and the lift force to dramatically decrease[4] (Figure 6).

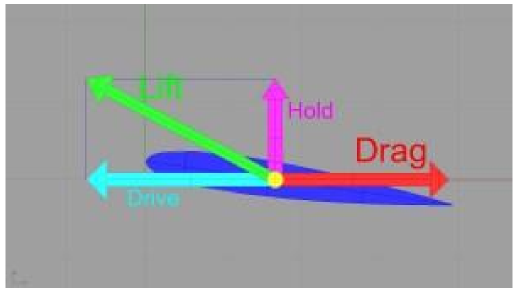

Figure 5: Lift on a surfboard fin

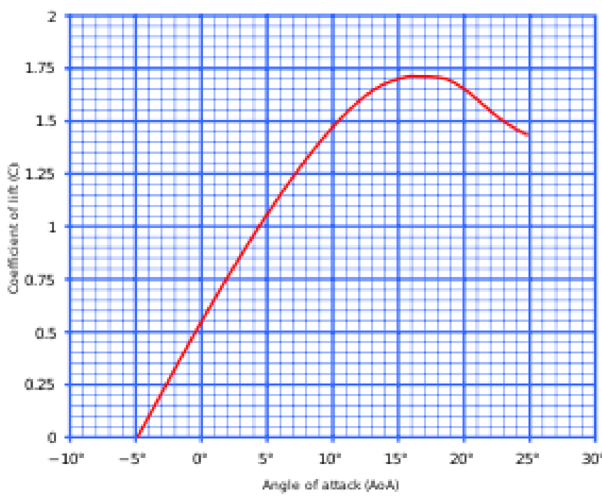

Figure 6: Impact of the Angle of Attack on the Coefficient of Lift

The relationship between turning and lift is also reflected in the data presented by the fin manufacturer, Futures Fins. After contracting an engineering firm to apply a computational fluid dynamics model to three sets of surfboard fins that fall in different categories, their findings reflect what is present in the engineering literature. They observed the drop off in lift because of the turbulence generated by a large angle of attack at around 20 degrees[5] (Figure 8 and 10) They

[4] Winslow (2018)
[5] Futures Fins, Computational Fluid Dynamics

also observed that different fin foils resulted in different levels of lift as each one would produce a different pressure gradient, resulting in a larger or smaller lift coefficient[6] (Figure 9).

Figure 8: Visualizations of Water Flow Turbulence Across a Surfboard Fin

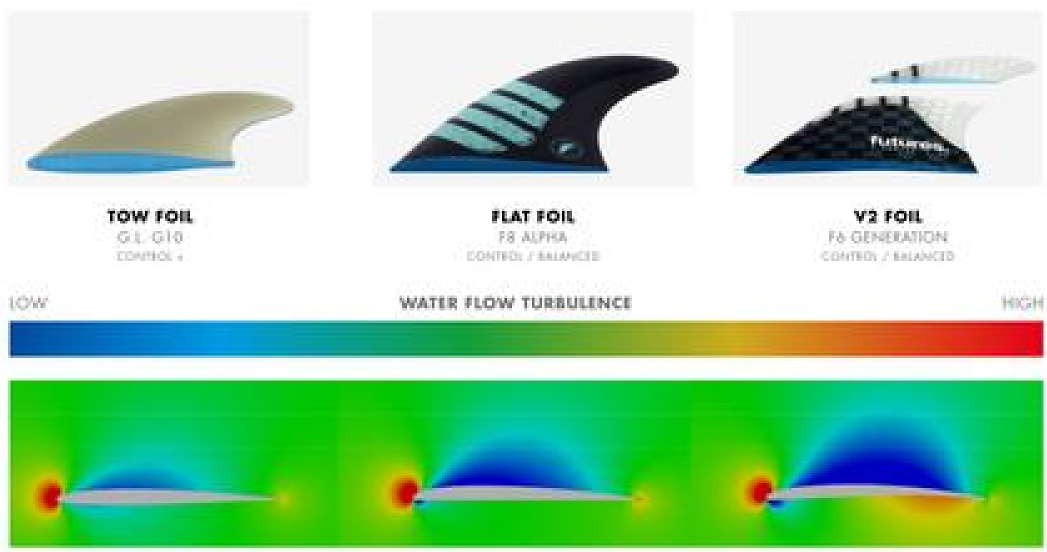

Figure 9: Visualizations of Pressure Differentials with Surfboard Fin Foils

With regards to surfboard fins, Futures observed that there was a difference in lift related to the area of the fin behind the base. As the fin area got bigger behind the base (R6 or Raked 6 has a larger area than P6 or Pivot 6), the fin generated more lift at the tip, a product of area being part

[6] This is consistent with information in the NACA database for airfoils

of the lift equation (Figure 10). They then refer to this property as "rake" or the ratio of the area of a fin behind the base to the area in front of the base (Figure 11). Other companies refer to rake as the length of the front edge of the fin, but all come to the same conclusion about rake: more rake results in wider, longer turns.

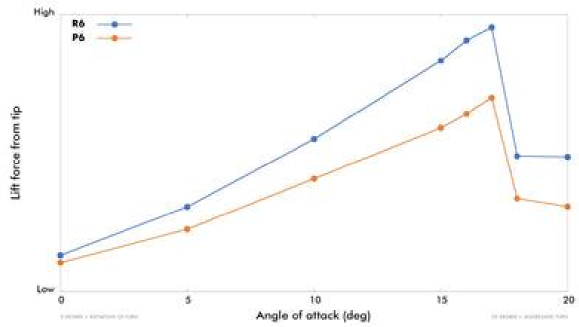

Figure 10: Lift Force at the Tip of a Fin as a Function of Angle of Attack

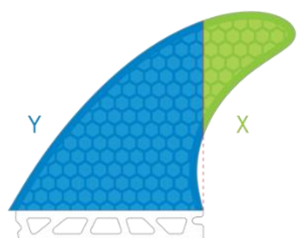

Figure 11: Futures Rake Ratio

Using Future's data for rake, as shown in Figure 9, it can be clear to see why this creates wider turns. A fin that generates more lift because of its larger area, will create more forward propulsion and accelerate forward at a faster rate. This faster acceleration causes the board to travel at a higher velocity. Traveling at a higher velocity requires a larger radius to turn the board with the same amount of force because of the centripetal force equation. The equation is:

$$F_{Centripetal} = m * \frac{v^2}{r}$$

Centripetal Force Equation

where *m* is the mass of the rider, *v* is the velocity, and *r* is the radius. As this force increases, it can become greater than that of the force perpendicular to that of the fin, causing the board to slide.

Besides the differences in lift generated by the size of the area behind the base or the area of a fin behind its base, the height of the fin also plays a factor in the performance of a fin. Towards the surface of the ocean, where air is interacting with water, there is fluid mixing, which creates pockets of turbulent water[7]. As mentioned before, turbulence disrupts the ability of a fin to generate lift, which can not only prevent forward propulsion but also greatly diminish the amount of force perpendicular to the fin. This means that a fin that has more area and is deeper in the water will interact with fewer turbulent pockets resulting in a more consistent riding experience.

Before continuing it should be mentioned that there are other lift generating factors besides the surfboard fins themselves. The shape of the surfboard, particularly the channels underneath it, the outline (rocker), and the shape of the rails of the board help supplement the lift produced by the fins and assist both with propelling the board forward, but also with generating forces that are directly in opposition to the centripetal force, allowing for sharper turns[8].

However, almost every board is different in each one of these regards. From a logical perspective it made sense to quantify and categorize the characteristic differences between the fins. One set of fins can be applied to a wide variety of boards and costs about 90% less than a new surfboard. Thus, when a board does not feel how it should, fins are purchased to complement a board, rather than a whole new board being purchased to go with the fins.

[7] Asher 2019
[8] Surf Simply, Surfing Explained Ep 1: Understanding Speed and Grip

METHODS

I. Proposed Explanatory Metrics

Based on the information from the literature review, four metrics were identified as potentially being able to quantitatively explain the difference between the categories of fin for a particular manufacturer. All these metrics needed to be normalized in some regard so that there would be an ability to identify the differences between fins, given that they both have the same height and area, but belong to separate categories.

Given that the height of a fin determines how much fluid mixing and turbulence it could be exposed to, the metric was the average depth of the area of a fin. This value was then normalized by dividing by the overall height of the fin producing the "depth ratio".

Given that the "rake" of a surfboard fin is said to determine the differences between categories, two separate fields were created to measure rake. One was the ratio that Futures gave between the area behind the base and the area in front of the base (Figure 11). This is referred to in the data as the "rake ratio". The other was the average width location of the area of a fin, measured in inches from the front of the fin. This is a metric that increases as the length of the leading-edge increases, which falls in line with the rake descriptions given by FCS and Captain Fin, two other fin manufacturers. The value was then normalized by dividing by the length of the base and is referred to in the data as the "width ratio". Both values are expected to be highly corelated.

Finally, a metric was created that serves as a combination of both the rake and the height. It is created by drawing a vector from the front, bottom corner of the fin to the location of the intersection of the average width and average depth. From there, the angle between the bottom of the fin and the vector can be calculated. This provides a numerical measurement of the ratio between the width of the fin and the height of the fin.

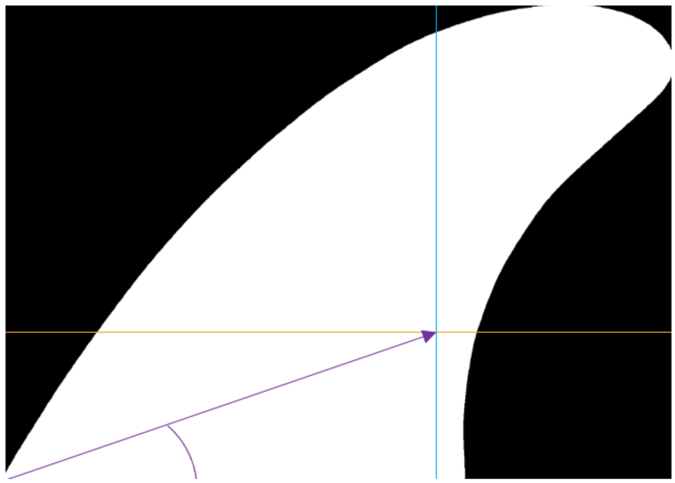

Figure 12: Depth Ratio (Orange), Width Ratio (Blue), Angle (Purple)

II. Programming Language Utilized

To calculate these values for any fin in question, it was necessary to create a script that could allow for any fin to be input and for the code to be able to reliably generate the desired metrics. MATLAB was chosen as the preferred language for this process as it has well-developed image processing commands that allow for numerical calculations. Most of the functions that were utilized for this project stem from converting images into black and white and labeling black pixels as 0's and white pixels as 1's.

From the MATLAB program, the data was passed to Microsoft Excel. There groupings of fins could be organized and further calculations, such as the angle metric, could be carried out with basic formulas.

III. MATLAB and Excel Programming

This section will provide an overview of how the 247 lines of MATLAB code bring in a fin image and extracts the calculations for each metric, while establishing methods for checking the code's accuracy for each calculation. The entirety of the code is provided within the appendix.

The code begins by starting a loop so that multiple fins can be exported at one time to an excel spreadsheet if one so chooses. Then, the program opens a dialogue that allows the user to select a fin image from there computer (Figure 13).

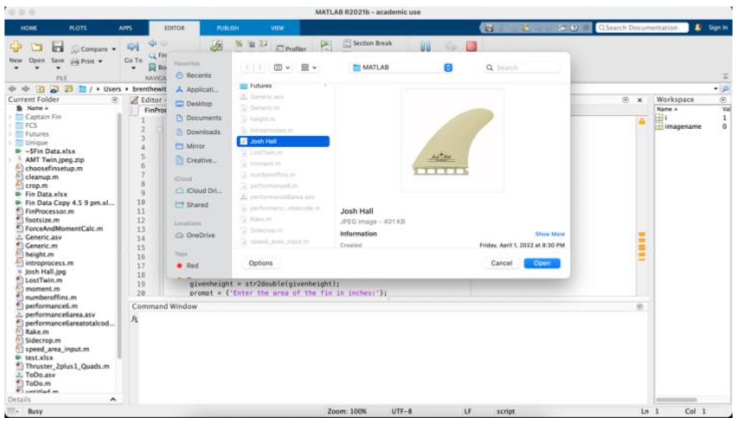

Figure 13: Select the Appropriate Fin

The image is read into the code as a matrix and the user is prompted to give the type of fin as there are different sets of user instructions for manually cropping the image to remove the fin box, based on the type of fin (Figures 14 and 15). As each image would load in as a different size, there was little success in writing a function that could teach the crop out the fin box. Instead, it was determined that the most efficient manner method would be to let the user crop the image.

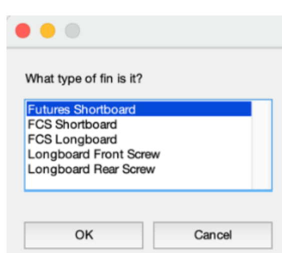

Figure 14: Fin Type Prompt

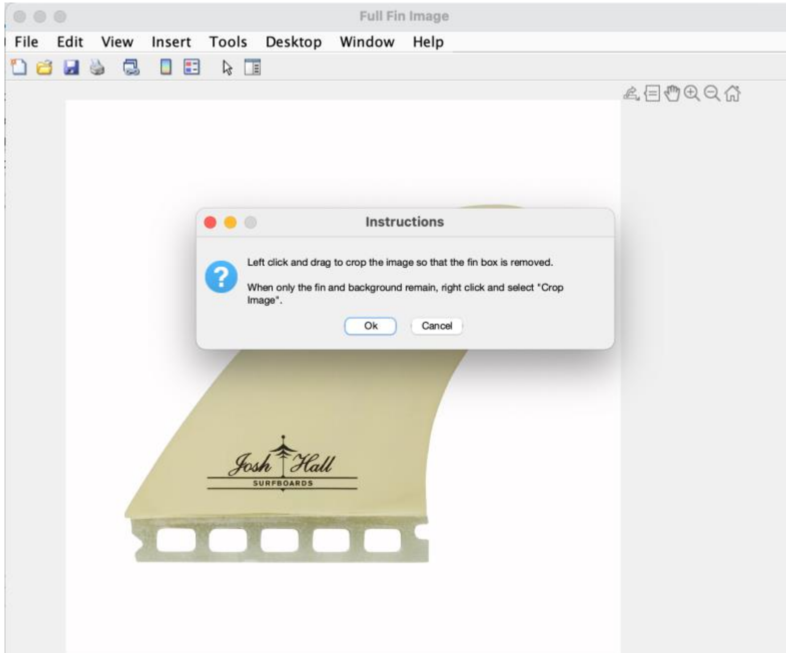

Figure 15: Full Fin Image with Cropping instructions

From there, the user is shown the image and asked if they wish to try again or if they approve of the cropped image (Figure 16).

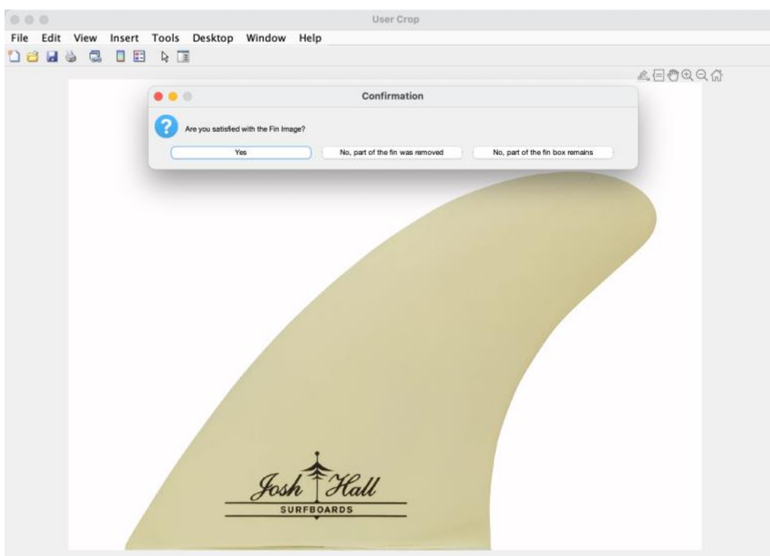

Figure 16: Approve the Cropped Image

Next, the user is shown a slide bar and is asked to differentiate if the fin is lighter or darker (Figure 17). From there they are shown the black and white image for the fin and are prompted to answer if the fin is incomplete or if it is too pixilated (Figure 18)

Figure 17: Fin Color Prompt with Slider

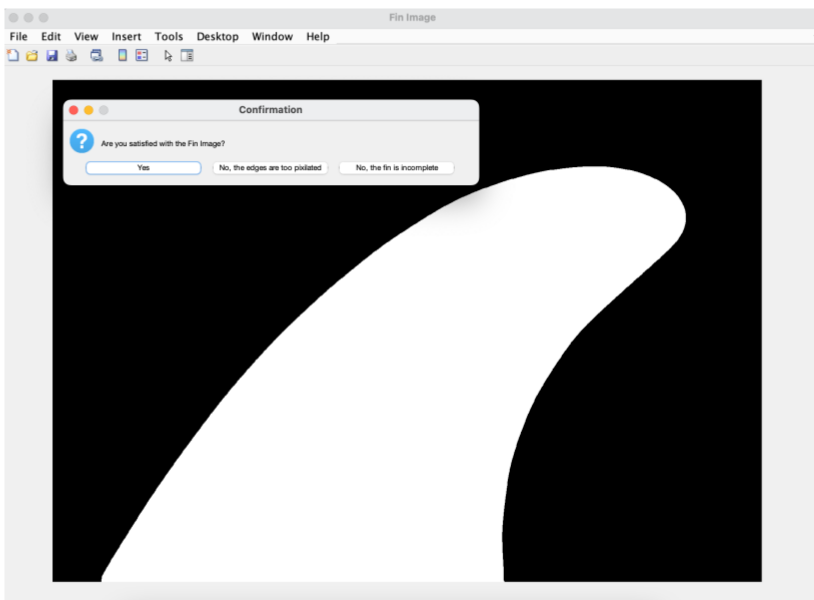

Figure 18: Black and White Image of Josh Hall Surfboard Fin

As fins come in a variety of different colors, one sensitivity threshold for separating a fin from its white background is not sufficient. Dark fins become pixilated and oversized if the sensitivity is too high (Figure 19) and lighter colored fins remain incomplete if the threshold is too low (Figure 20).

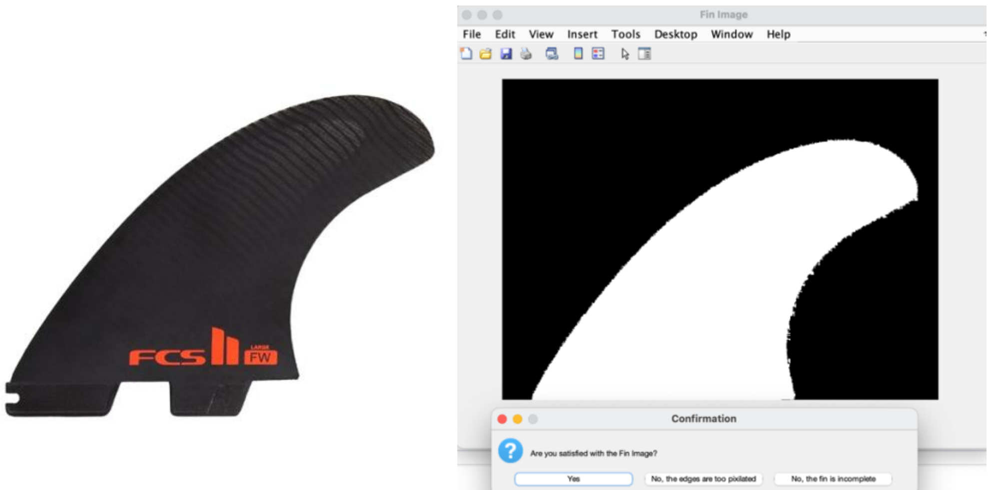

Figure 19: Pixilated FCS Fin Due to Too High of a Sensitivity

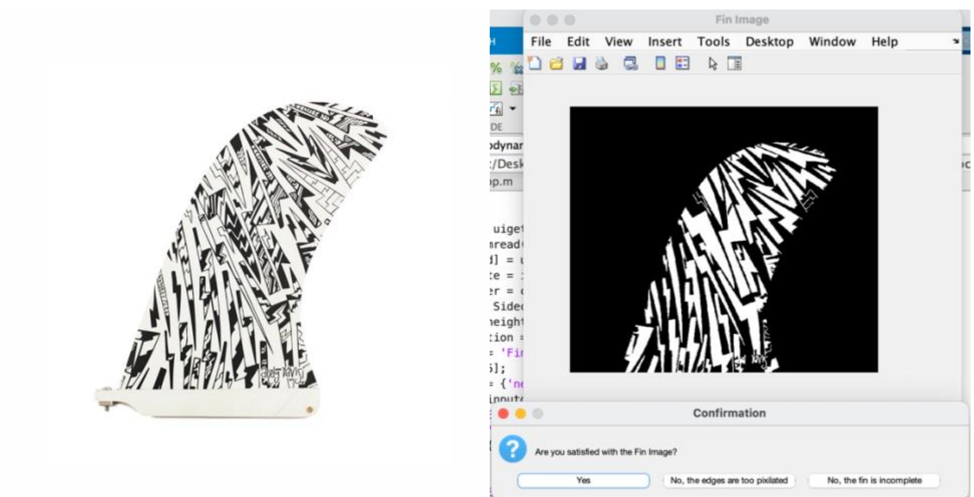

Figure 20: Incomplete Longboard Fin Due to Too Low of a Sensitivity

This requires the sliding scale that is shown in Figure 16. It moves between a sensitivity of 0.80 and 0.999. From there the user is given the option to approve or disapprove the image. If they select the option for too pixilated, the computer will suggest moving the slider back towards the darker side (Figure 21). If they select the option for incomplete, the computer will suggest moving the slider further towards the light side (Figure 22).

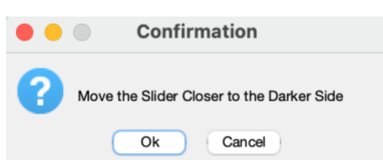

Figure 21: Image is Too Pixilated Prompt

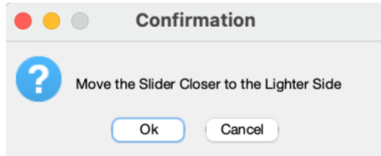

Figure 22: Image is Incomplete Prompt

After the image has been converted to black and white and is deemed appropriate by the user, then the program begins prompting the user for information about the fin. It asks for the manufacturer's given values for fin type (Figure 23), height (Figure 24), and area (Figure 25).

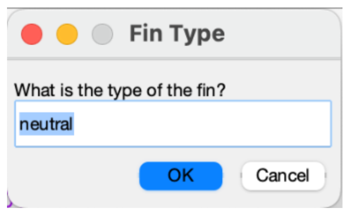

Figure 23: Prompt for Fin Type

Figure 24: Prompt for Fin Height

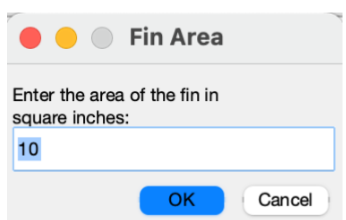

Figure 25: Prompt for Fin Area

After logging the information, the code generates a conversion factor between the width/height of one pixel and inches. It counts the number of rows of pixels containing at least one white pixel and then divides the given value for the height by the number of pixels. This generates a conversion factor of inches/pixel width. Then, the code uses the MATLAB command "bwarea" to find the area of the white part of the image in pixels. This is then multiplied by the conversion factor squared to generate the program's estimate for the area of the image, in inches. This value is then compared to the manufacturer's value for the area to determine the accuracy of the following metrics.

Next to be calculated is the average depth of the fin. This can be found via the moment equation for a submerged body. However, this equation requires integration, and a surfboard fin does not have a nice, simple shape that allows for the small changes in area to be represented as a function of the change in depth. Therefore, the most useful method for integration is the Riemann sum. After some derivation, it can be determined that the line of action or z' is the sum of the area of each row of the Riemann sum multiplied by the depth at which that area occurs, all divided by the total area. The calculus is below:

$$z' F_R{}' = \int_{base}^{tip} zpdA$$

$$p = \frac{F_{Total}}{A_{Total}}$$

$$z' F_{Total} = \sum z_n \frac{F_{Total}}{A_{Total}} A_n$$

$$z' = \sum z_n \frac{A_n}{A_{Total}}$$

$$z' = \frac{\sum z_n A_n}{A_{Total}}$$

Derivation of the Line of Action

The number of rows of pixels would be the number of separate areas that would be added for each Riemann sum. Each Riemann sum would be 1 pixel high and then the total number of white pixels in that row, wide. Since each area was roughly assumed to be a rectangular row of pixels, it was assumed that z_n would be halfway up each row of pixels, so z_n for the 15^{th} row would be 15.5 pixels tall.

At each step, the conversion factor was used to make sure that all pixel values would be converted to inches and after all the calculation was complete, the program would produce z' or the average height at which the distributed force acts on a fin. This height is then of course divided by the given, manufacturer's height to produce a ratio.

This process is then repeated for the average width location, except the fin is rotated 90 degrees before initiating the process of integrating the image via the Riemann sum. The length of the base is found by summing the bottom row of the image, prior to rotating it and multiplying by the conversion factor. Dividing the width by the base length gave a normalized value for this.

Next, the code generates the Future's rake ratio by identifying the column that holds the last 1 in the image, this value should be the back of the fin base. It then splits the fin image into two separate images, one for the front of the fin and one for the back. From there, separate bwarea operations can be run and the back area can be divided by the front area to produce the X to Y relationship shown in Figure 11.

Finally, all the data is input into a matrix with the file name of the fin being listed in the first column and the rest of the row being filled columns for the fin type, given area, given height, calculated area, length of the base, depth ratio, width ratio, rake ratio, and percent error in the area. The user is then asked if they want to end the loop (Figure 26). If they choose to, they may input additional fins. If they choose not to, the information will be written to a Microsoft Excel Spreadsheet titled, "test".

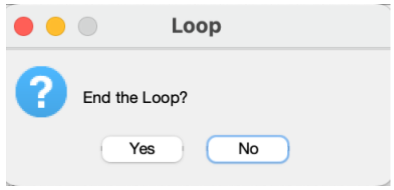

Figure 26: Loop Dialogue

Once in the Excel spreadsheet, the data is transformed further. The average depth can be backed out of the matrix by multiplying the depth ratio by the height. The average width can be backed out of the matrix by multiplying the width ratio by the base length. The angle is then found by taking the arctangent of the average depth divided by the average height. Considering that the angle is constant for similar triangles, even as the base and height change, the angle can remain constant. Thus, this is a normalized value.

This process was repeated for all 282 fins that comprise the data.

DATA ANALYSIS

Before using any statistics to determine if any of the metrics could provide insight into a quantitative difference between the categories it was necessary to determine if the model itself was accurate.

Comparing the percent differences between the MATLAB calculated areas and the manufacture data, the MATLAB program, on average, overestimated the fin are by 1.74% (Figure 27 and Table 1). While there was noise within the data, over 65% of the data is within ±5% of the manufacturer's given value. The few large outliers tended to be caused by images that had light fins with a dark shadow. The program struggled to differentiate a light-colored fin from a gray shadow when only using a sensitivity metric.

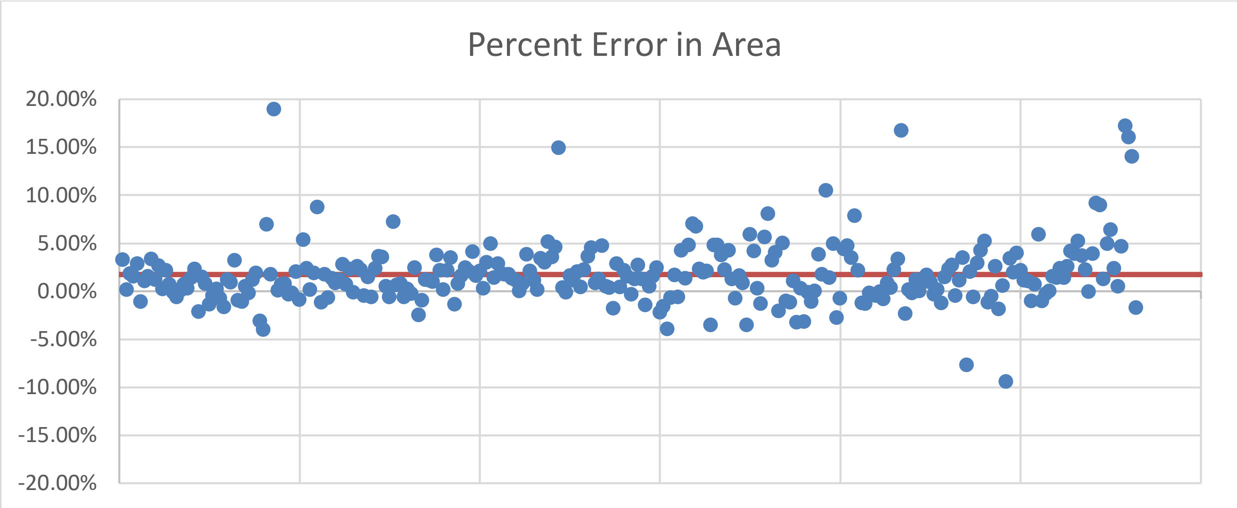

Figure 27: Percent Error in the Area Calculation

Percent Error in Area	Percent Error in Shortboard Fins	Percent Error in Longboard Fins	Max Error	STD Dev Error
1.74%	1.61%	2.09%	18.98%	3.30%

Table 1: Percent Error Broken Down by Fin Type

Also, as expected, the rake ratio and width ratio were very strongly correlated (R = 0.9815) suggesting that while different methods for classifying rake that exist, they identify the same fins (Figure 28).

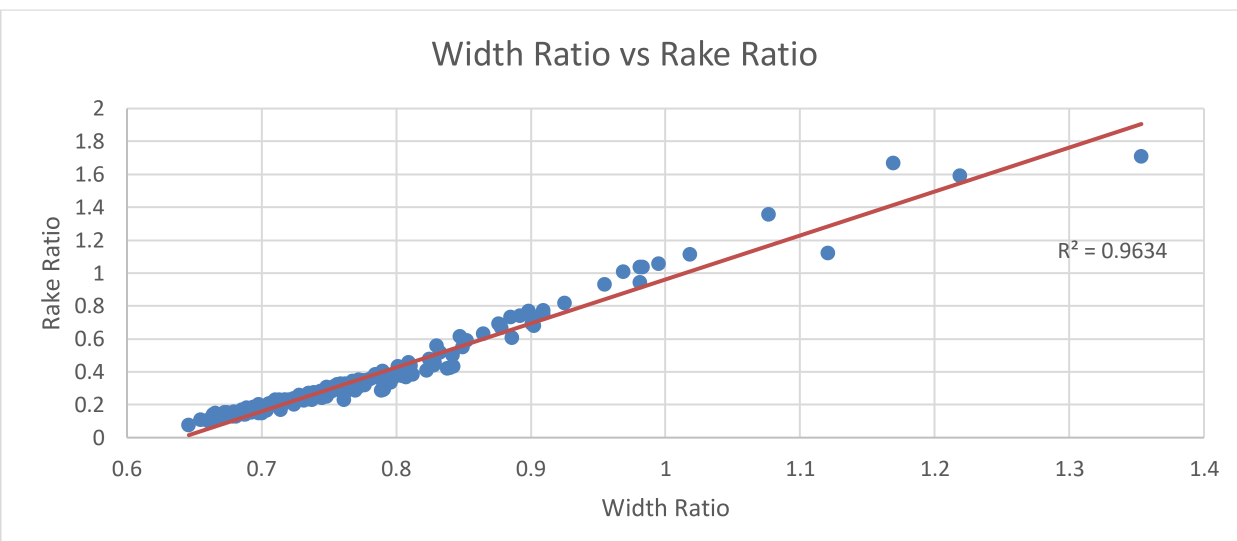

Figure 28: Correlation between the Rake Ratio and the Width Ratio

With the outputted data sufficiently meeting the expected requirements, the data was split up by manufacturer and fin type, within Excel. Then, for each possible pairing within a manufacturer, a 2-sample t-test Assuming Unequal Variance was performed as there was no information present to confirm that each fin category would have similar variances for each metric. This meant that for each of the metrics, 85 2-sample t-tests were run. There were 28 t-tests for Captain Fin, 21 for FCS, and 36 for Futures as they each had 8, 7, and 9 categories, respectively.

For each t-test, the null hypothesis was that the two categories had no difference between their means and the alternative hypothesis was that the two categories were assumed to be not equal, resulting in a two tailed test. The categories, if P(T≤t) two-tail was less than 0.10, were then labeled as either being significant at alpha level of 0.10, 0.05, and 0.01. An example of one of the tests is shown below as Table 2.

t-Test: Two-Sample Assuming Unequal Variances		
	Futures Neutral	Futures Pivot
Mean	32.635	33.453
Variance	1.038	4.241
Observations	25	16
Hypothesized Mean Difference	0	
df	20	
t Stat	-1.4785	
P(T ≤t) one-tail	0.078	
t Critical one-tail	1.725	
P(T≤t) two-tail	0.155	
t Critical two-tail	2.086	

Table 2: Output from a Two-Sample t-Test Assuming Unequal Variances between Futures Neutral and Futures Pivot

A tally of the number of the statistically significant categories was taken and tabulated for each of the metrics to determine which metrics provided the most statistically significant quantitative differences between each of the categories (Table 3).

Depth Ratio			
	Captain Fin (8)	FCS (7)	Futures (9)
Number of t-Tests	28	21	36
Not Statistically Significant	71.43%	57.14%	30.56%
Significant at alpha = 0.10	28.57%	42.86%	69.44%
Significant at alpha = 0.05	17.86%	28.57%	52.78%
Significant at alpha = 0.01	10.71%	19.05%	33.33%
Width Ratio			
	Captain Fin (8)	FCS (7)	Futures (9)
Number of t-Tests	28	21	36
Not Statistically Significant	60.71%	57.14%	61.11%
Significant at alpha = 0.10	39.29%	42.86%	38.89%
Significant at alpha = 0.05	25.00%	38.10%	36.11%
Significant at alpha = 0.01	21.43%	9.52%	22.22%
Rake Ratio			
	Captain Fin (8)	FCS (7)	Futures (9)
Number of t-Tests	28	21	36
Not Statistically Significant	53.57%	61.90%	55.56%
Significant at alpha = 0.10	46.43%	38.10%	44.44%
Significant at alpha = 0.05	35.71%	38.10%	27.78%
Significant at alpha = 0.01	25.00%	14.29%	22.22%
Angle			
	Captain Fin (8)	FCS (7)	Futures (9)
Number of t-Tests	28	21	36
Not Statistically Significant	21.43%	28.57%	30.56%
Significant at alpha = 0.10	78.57%	71.43%	69.44%
Significant at alpha = 0.05	75.00%	66.67%	61.11%
Significant at alpha = 0.01	75.00%	61.90%	44.44%

Table 3: Percentages of t-Tests for Each Metric and Their Statistical Significance

As is labeled in Table 3, across all 3 brands, the angle metric, which was intended to be a combination between depth and rake, produced the lowest or joint-lowest percentage of fin types that were not statistically significant from one another and the highest percentage of fin types that were statistically significant at an alpha level of 0.01.

Angle also did not explain all the differences between fins. Some of this was the result of categories that had unique shapes or served as a catch-all for the brand such as, “neutral”. Either way, these variables had high variances making them less likely to register as statistically significant.

CONCLUSION

To conclude, the surfboard fin market currently lacks a definitive metric for helping determine performance and is dominated by qualitative traits and inapplicable dimensions. Wanting to demystify this has necessitated the development of a quantitative metric for comparing fin performance metrics, without having to purchase the fins. After comparing a variety of fin categories across the 3 main manufacturers, understanding the angle created by the location of a fin’s area in terms of both its average depth and its average width produces the most statistically significant differences between categories. Based on how the angle model is set up, a fin with a larger angle, should be able to turn more rapidly as it is interacting with less turbulent water and should be generating less forward propulsion than a fin with a smaller angle. On the other hand, fins with low angles should be expected to provide great linear speed and will require large turns with greater radii to avoid sliding. Moving forward, The angle model could provide a metric for comparing fins within a family, but more testing would be needed as the angle differences within a family were slight and do not account for any effects that the fin’s foil or flex may have on the riding experience. However, if one is really experiencing sliding with a board, the wise choice would be to examine the angle and choose a fin with a greater angle. On the other hand, if one feels that the board is overly responsive or lacking speed, one may want to look for a fin with a smaller angle. The search for the right set of fins is still a challenge, but it just got quite a bit easier.

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APPENDIX

All Data:

Name	Type	Given Area	Given Height	Calculated Area	Base Length	Depth Ratio	Width Ratio	Rake Ratio	Percent Error in Area	Depth Line	Width line	Vector length	INV Tangent depth/base
Mayhem Evil Twin	hybrid keel	21.25	5.12	21.93906136	4.768983452	0.452779521	0.852513584	0.589076275	3.24%	2.318231149	4.065623172	4.680116178	29.69192481
Al Merrick Keel Twin	keel	25.54	5.15	25.57456444	4.635	0.456525574	0.995198644	1.054247394	0.14%	2.351106709	4.612745715	5.177366685	27.00784271
K2 Keel Twin	keel	22.25	4.63	22.65277117	4.915410959	0.450468225	0.954852055	0.929765484	1.81%	2.085667881	4.693490254	5.13603556	23.95914745
Machado Keel	keel	25.39	5.17	25.77935258	5.003790186	0.442118124	0.898472236	0.767701408	1.53%	2.285750701	4.495766557	5.04346837	26.9498266
Rasta Keel	keel	24.59	4.77	25.28315063	4.515716912	0.451424763	1.121081121	1.118227164	2.82%	2.153296121	5.062484979	5.501403307	23.04217
Ando Blackstix	neutral	15.5	4.56	15.33367307	4.443264	0.455467827	0.734863523	0.245834638	-1.07%	2.076933289	3.265192638	3.869771938	32.45974318
Britt Merrick Twin	neutral	23.58	5.39	23.83214128	4.750508475	0.458190264	0.909424603	0.752368391	1.07%	2.469645525	4.320229282	4.976296823	29.75430899
Custom Series 3:2 Side	neutral	15.13	4.53	15.36271593	4.403130148	0.461571388	0.729493084	0.242249438	1.54%	2.090918386	3.21205299	3.832652359	33.06252236
Dark Arts	neutral	15.37	4.71	15.88447106	4.467684887	0.451684375	0.734188773	0.24145762	3.35%	2.127433406	3.280124085	3.909627464	32.96676479
EA Control Quad Front	neutral	14.5	4.42	14.67090221	4.411860037	0.45784818	0.704717849	0.198071413	1.18%	2.023688957	3.109116516	3.709706526	33.05965021
EN Twin	neutral	22.75	5.55	23.34779452	4.82693662	0.457149971	0.83238073	0.515965954	2.63%	2.537182337	4.017849026	4.751884363	32.27150005
F4	neutral	14.22	4.37	14.24552854	4.25453252	0.459889789	0.730456914	0.242969063	0.18%	2.009718378	3.107752695	3.700958629	32.88990017
F6	neutral	15.12	4.56	15.44125064	4.452344013	0.45944685	0.727668504	0.237022615	2.12%	2.095077635	3.239830506	3.85821876	32.88924312
F8	neutral	15.9	4.64	16.00787162	4.515316699	0.45990101	0.727186109	0.236641093	0.68%	2.133940688	3.283475582	3.915981966	33.01996109
Freestone	neutral	15.57	4.67	15.55378953	4.461118211	0.453376916	0.720976449	0.221827911	-0.10%	2.117270197	3.216361164	3.850689838	33.35615985
Grom John Honeycomb	neutral	13	4.31	12.92220507	4.123346457	0.452136683	0.71045384	0.195736918	-0.60%	1.948709105	2.929447324	3.518398613	33.63240334
John Large	neutral	16.05	4.71	16.06701199	4.606645768	0.451408417	0.722520421	0.22042177	0.11%	2.126133646	3.328395641	3.949514125	32.56988415
John Medium	neutral	14.98	4.56	15.08458834	4.479227053	0.451943223	0.722558767	0.219545886	0.70%	2.060861095	3.236504778	3.836940399	32.48715595
John Small	neutral	14.1	4.42	14.13884698	4.353478261	0.451442884	0.722460088	0.218738135	0.28%	1.995377547	3.145214288	3.72476905	32.39173802
Mayhem Large	neutral	15.85	4.67	16.06904153	4.597484472	0.452989144	0.731498649	0.241169575	1.38%	2.1154593	3.363053681	3.973071622	32.17109566
Mayhem Medium	neutral	14.78	4.5	15.1203571	4.529411765	0.452636826	0.729385047	0.237359704	2.30%	2.036865716	3.303685214	3.881128436	31.65563902
Mayhem Small	neutral	13.37	4.28	13.08758266	4.130697674	0.450971849	0.725795807	0.23019342	-2.11%	1.930159512	2.998043051	3.565638495	32.7736967
Pancho Control	neutral	16.7	4.71	16.93907884	4.638636364	0.456267318	0.75692227	0.291947422	1.43%	2.149019068	3.511087164	4.116553902	31.46940694
Pyzel Large	neutral	16	4.64	16.12579891	4.687958656	0.451872696	0.718343803	0.213716527	0.79%	2.096689312	3.367566049	3.966939269	31.90691645
Pyzel Medium	neutral	15.15	4.51	14.93653903	4.486263158	0.451148517	0.711623318	0.203717683	-1.41%	2.034679812	3.192529476	3.785784779	32.510393
Rasta Quad Front	neutral	14.72	4.44	14.6526449	4.332580645	0.461694395	0.728877531	0.240706676	-0.46%	2.049923112	3.157920684	3.764923347	32.98909313
Rasta Twin	neutral	19.76	5.14	19.80265906	4.644263959	0.466514405	0.76233457	0.325189664	0.22%	2.397884042	3.54048297	4.276080863	34.10884142
Son of Cobra Twin	neutral	21.75	5.68	21.58519325	4.616898396	0.450790914	0.789948625	0.400738281	-0.76%	2.560492391	3.64711254	4.456181231	35.07116376
T1 Twin	neutral	19.79	5.14	19.46182269	4.727364747	0.464684648	0.769216773	0.323303015	-1.66%	2.38847909	3.636368255	4.350632879	33.29814651
Tokoro Honeycomb	neutral	15.22	4.59	15.39760572	4.634064	0.444285969	0.729257318	0.234282089	1.17%	2.039272599	3.379425083	3.94704277	31.10836586
Custom Series 3:2 Center	neutral center	14.6	4.48	14.73636965	3.221573034	0.476497881	0.981280211	0.938879595	0.93%	2.134710508	3.161265865	3.814523669	34.03000751
Machado Quad Rear	neutral rear	10.16	3.11	10.48483269	3.605797101	0.441180497	0.830265672	0.557722809	3.20%	1.372071345	2.993769554	3.293210579	24.62240967
QD2 3.75 Quad Rear	neutral rear	10.73	3.76	10.62499405	3.77516129	0.454307213	0.697009604	0.184391092	-0.98%	1.708195119	2.631323675	3.137163504	32.99071086
QD2 4 Quad Rear	neutral rear	11.67	4.05	11.54059716	3.810443623	0.454893102	0.713241561	0.211651147	-1.11%	1.842317062	2.717766759	3.283350166	34.13252161
QD2 4.15 Quad Rear	neutral rear	12.6	4.15	12.65901408	4.203010949	0.450277841	0.708334005	0.199588465	0.47%	1.868653041	2.977135578	3.514996506	32.11518115
Akila Aipa Twin	pivot	19.1	5.4	19.06231068	4.663242376	0.445824516	0.776962647	0.344531564	-0.20%	2.407452385	3.623165139	4.350075012	33.60249275
AMT HC Twin	pivot	20.43	5.63	20.67465504	4.650869565	0.445081519	0.76792243	0.3417113	1.20%	2.505808951	3.571507056	4.362882207	35.05392535
DJ Twin	pivot	18.55	5.39	18.90433075	4.818675035	0.44382604	0.744477077	0.251462174	1.91%	2.392222355	3.587393107	4.311857732	33.69699925
HS1	pivot	15.55	4.67	15.06553292	4.359018059	0.451803001	0.691829165	0.168762969	-3.12%	2.109920015	3.015695824	3.680514064	34.97841168
HS2	pivot	14.54	4.45	13.95569149	4.186997636	0.454242311	0.690928545	0.174807584	-4.02%	2.021378283	2.892916183	3.529154885	34.94330089
Machado Pivot	pivot	16	4.6	17.11052518	4.659934853	0.446988397	0.742099981	0.255908145	6.94%	2.056146628	3.458137567	4.02323929	30.73495797
Machado Quad Front	pivot	21.2	4.85	21.57598837	4.89417122	0.454067719	0.864673314	0.627444098	1.77%	2.202228437	4.231859249	4.77058097	27.4921374
Machado Twin	pivot	19.04	5.61	22.65344479	5.045471698	0.453406144	0.772360466	0.347858795	18.98%	2.54360847	3.896922873	4.653595591	33.13338072
P4	pivot	14.22	4.44	14.22998617	4.27128	0.447785392	0.717995065	0.213820699	0.07%	1.988167139	3.066757963	3.654834193	32.95518288
P6	pivot	14.98	4.55	15.08301656	4.381481481	0.447982423	0.717375962	0.213372786	0.69%	2.038320023	3.143169492	3.746233171	32.96308296
P8	pivot	15.9	4.69	16.0268011	4.563973129	0.446903432	0.715242435	0.206924749	0.80%	2.095977097	3.264347252	3.879314756	32.70377097
Pyzel Padillac Quad Front	pivot	14.45	4.48	14.39811444	4.311849866	0.455072734	0.674123924	0.151502729	-0.36%	2.038725848	2.906721153	3.550412785	35.04518072
Stretch Quad Front	pivot	14.52	4.39	14.48745764	4.281604938	0.45652699	0.689056264	0.178840493	-0.22%	2.004153487	2.950266702	3.566609709	34.18876358
Tomo Quad Front	pivot	15.05	4.71	15.35872183	3.665066225	0.483516001	0.842115218	0.500608611	2.05%	2.277360365	3.086408045	3.835659637	36.42241256
TP1 Honeycomb	pivot	15.27	4.62	15.13237878	4.553895072	0.448397071	0.693938397	0.172828408	-0.90%	2.071594467	3.160122644	3.778608045	33.24654162
Zack Flores Twin	pivot	19.58	5.46	20.63385359	4.883366337	0.453643294	0.749290257	0.284155511	5.38%	2.476892386	3.659058816	4.418563942	34.09488167
Machado Pivot Center	pivot center	14.51	4.06	14.85080603	4.514926004	0.448042489	0.756287678	0.32019744	2.35%	1.819052506	3.414582905	3.868892404	28.04558997
HS Quad Rear 4.2	pivot rear	12.09	4.21	12.10650451	3.971954766	0.448751808	0.710628698	0.202474265	0.14%	1.889245113	2.822585045	3.396503119	33.79564209
Stretch Quad Rear	pivot rear	12.39	4	12.62060601	3.943127962	0.459824465	0.713101546	0.228213065	1.86%	1.83929786	2.811850647	3.359988196	33.18964591
Tomo Quad Rear	pivot rear	13.1	4.24	14.24543642	3.538646617	0.478761782	0.902636276	0.676664972	8.74%	2.029949956	3.194110805	3.784579324	32.43714088
AM1	rake	14.84	4.5	14.66668204	4.492512479	0.449118468	0.734953249	0.247883908	-1.17%	2.021033106	3.301786642	3.871223301	31.47092038
AM1 Honeycomb Center	rake	13.35	4.29	13.58182685	4.374810544	0.45130684	0.733995231	0.244020822	1.74%	1.936106343	3.211090075	3.749614279	31.08760891
AM2	rake	15.98	4.73	15.87525213	4.606224299	0.448080155	0.737595348	0.245755435	-0.66%	2.119419131	3.397529616	4.004390709	31.95640229
AM2 Center	rake	15.32	4.49	15.52350829	4.637454844	0.453768211	0.752438257	0.282268602	1.33%	2.037419269	3.489398439	4.040665631	30.28016004
AM3	rake	13.8	4.38	13.91814221	4.345579568	0.449979018	0.739859805	0.255040184	0.86%	1.970908097	3.215119654	3.771136846	31.50881207
Coffin Bros	rake	15.1	4.58	15.28091962	4.493037975	0.451222208	0.741579005	0.26271471	1.20%	2.066597711	3.331942629	3.920799381	31.80876527
DHD Large	rake	15.83	4.69	16.26618678	4.560680147	0.454265686	0.754124925	0.296521724	2.76%	2.130506066	3.439322572	4.045737986	31.7763576
DHD Medium	rake	14.37	4.45	14.47061299	4.324530075	0.449978863	0.748812351	0.28260883	0.70%	2.00240594	3.238261533	3.807356997	31.73091883
EA Control	rake	15.16	4.57	15.50667245	4.486036745	0.457289616	0.741771853	0.265842966	2.29%	2.089813546	3.327615791	3.92942076	32.12969558
Jordy Signature (L)	rake	15.92	4.68	15.90195256	4.579174147	0.452236077	0.740402807	0.254433986	-0.11%	2.116464841	3.390433392	3.996806476	31.97431113
Jordy Signature (M)	rake	14.5	4.47	14.86970428	4.511932458	0.452366273	0.734845012	0.243898152	2.55%	2.02207724	3.31557106	3.883530329	31.37788716
Machado Blackstix	rake	15.23	4.57	15.5648331	4.460843949	0.460605312	0.748129903	0.276613961	2.20%	2.104966275	3.337290751	3.945680242	32.24131278
R4	rake	14.22	4.42	14.15545731	4.42	0.451262752	0.740399837	0.253081553	-0.45%	1.994581362	3.272567279	3.832499368	31.36168977
R6	rake	15.1	4.56	15.32440729	4.575225376	0.451848358	0.742961325	0.260334759	1.49%	2.060428511	3.399215509	3.974925374	31.222075
R6	rake	15.9	4.68	15.79991268	4.57580705	0.451242165	0.738006013	0.245214774	-0.63%	2.111813334	3.376973116	3.982926435	32.02008436
Solus	rake	15.23	4.63	15.59543003	4.554346405	0.455825464	0.734929416	0.247625627	2.40%	2.110471898	3.347123145	3.956933785	32.23278788
Controller Front Quad	split keel/pivot	18.24	4.5	18.89878089	4.823665893	0.448179757	0.901789097	0.728762602	3.61%	2.016808907	4.349929308	4.794726598	24.87440869
Controller Quad Rear	split keel/pivot rear	12.06	4.53	12.48967574	3.959291339	0.420233192	0.681269812	0.125632462	3.56%	1.903656358	2.697345667	3.301451374	35.21259728
Machado Twin Trailer	trailer	11	3.8	11.05423038	3.675409836	0.458397725	0.804044308	0.410301239	0.49%	1.741911357	2.95519236	3.430366899	30.51683827
Mayhem Evil Twin Trailer	trailer	7.22	2.91	7.175382735	3.12872549	0.466064006	0.724154269	0.236639548	-0.62%	1.356246259	2.26567992	2.640588838	30.90493014
T1 Twin Trailer	trailer	7.9	3.26	8.470385807	3.241888889	0.461796832	0.697714732	0.200397448	7.22%	1.505457674	2.261913637	2.717104361	33.64647131
Accelerator MED	accelerator	15.28	4.58	15.37866383	4.391263736	0.455610588	0.747137773	0.273510016	0.65%	2.086696491	3.280879007	3.888247588	32.45707459
H4 Side Large	accelerator	15.84	4.57	15.95889767	4.602783357	0.451430697	0.759850951	0.297058701	0.75%	2.063038283	3.497429313	4.060558921	30.53519672
H4 Center Large	accelerator	15.33	4.73	15.23960703	4.471770972	0.429285475	0.753702865	0.31081367	-0.59%	2.030520296	3.370386594	3.934783154	31.06724695
Filipe Toledo Large	accelerator	15.7	4.66	15.73065784	4.485006954	0.452917418	0.737121758	0.253720631	0.20%	2.110595167	3.305996213	3.922272673	32.55474186
Kolohe Andino Medium	accelerator	14.73	4.53	14.69115195	4.468617886	0.447427687	0.731810901	0.236129709	-0.26%	2.02684742	3.27018328	3.847363922	31.7904806
Kolohe Andino Large	accelerator	15.7	4.7	16.07900684	4.706351351	0.449173856	0.734018768	0.239112424	2.41%	2.111117122	3.454550218	4.048546988	31.42960305
FCS DHD Medium	accelerator	15.49	4.57	15.10814531	4.310843707	0.456751079	0.756288924	0.293027757	-2.47%	2.087352431	3.26024335	3.871204834	32.6291746
Tokoro Large	accelerator	15.42	4.62	15.26868912	4.563962264	0.445636091	0.732128938	0.237282418	-0.98%	2.058838741	3.341408847	3.924771337	31.63966802
Carver MED	carver	14.96	4.54	15.13303746	4.477978142	0.44956036	0.753118931	0.288852332	1.16%	2.041004034	3.372450112	3.941968699	31.18229164
Julian Wilson Large	carver	15.91	4.67	16.0900612	4.6233	0.44768463	0.743410369	0.272350121	1.13%	2.090687221	3.437009159	4.022934876	31.31159622
Julian Wilson Medium	carver	15.13	4.56	15.28285829	4.45495935	0.448932186	0.744155552	0.271858187	1.01%	2.047130767	3.315182733	3.896303496	31.69539808
Mick Fanning Large	carver	15.7	4.67	16.29179564	4.619308005	0.454143113	0.742874465	0.268425978	3.77%	2.120848336	3.431565964	4.034060316	31.7177636
JS Medium	carver	15.08	4.53	15.40950719	4.581623932	0.447711765	0.732394338	0.24467047	2.19%	2.028134294	3.355555425	3.920852066	31.14922313
Al Merrick X-small	carver	13.02	4.26	13.0343155	4.228676471	0.449564264	0.731372126	0.243115259	0.11%	1.915143764	3.092736099	3.637690505	31.76741958
Al Merrick Small	carver	13.71	4.37	14.00471119	4.43926513	0.448270267	0.734470866	0.246742571	2.15%	1.958941067	3.260510906	3.803732571	30.99778523
Al Merrick Medium	carver	14.89	4.52	15.41026107	4.641299435	0.45089927	0.730954215	0.24407074	3.49%	2.038064699	3.392577385	3.957687333	30.99501831
Al Merrick Large	carver	15.63	4.7	15.41656344	4.502574526	0.448535772	0.739094077	0.256859658	-1.37%	2.108118127	3.327826162	3.939364035	32.35352443
Performer MED	performer	14.81	4.55	14.92259566	4.371818182	0.457243307	0.733168212	0.245746443	0.76%	2.080457049	3.20527812	3.821270647	32.98648318
Jeremy Flores Large*	performer	15.49	4.6	15.73541929	4.554583921	0.457322076	0.72134177	0.221923717	1.58%	2.103681547	3.285411625	3.90120566	32.63183724
Firewire Large	performer	16.63	4.69	17.03194677	4.778106936	0.456208562	0.742790983	0.267648164	2.42%	2.139618154	3.549134747	4.144191513	31.08393765
Reactor MED	reactor	14.96	4.57	15.2694138	4.366039052	0.449482599	0.72976597	0.239191822	2.07%	2.054135477	3.186186724	3.790944262	32.80988707
Sally Fitzgibbons Medium	reactor	15.17	4.55	15.78920996	4.543424855	0.457668815	0.735245949	0.250971713	4.08%	2.082393109	3.340534721	3.936436623	31.93822478
CI Upright Large	reactor	15.79	4.7	16.0423935	4.519808307	0.448888796	0.706396145	0.193205313	1.60%	2.109777343	3.192775166	3.826875187	33.45662198

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HS Medium	reactor	14.97	4.59	15.28086323	4.577160839	0.449773508	0.687833533	0.169220557	2.08%	2.064460401	3.148324712	3.764830041	33.25417797
HS Large	reactor	15.74	4.7	15.78498711	4.622845417	0.448451403	0.685421093	0.164983807	0.29%	2.107721594	3.168595758	3.805586603	33.63149608
Matt Biolos Medium	reactor	14.49	4.59	14.92590312	4.442798834	0.452843831	0.729946138	0.230311644	3.01%	2.078553182	3.24300385	3.851942017	32.65721307
Matt Biolos Large*	reactor	15.26	4.74	16.01601277	4.666147309	0.448390332	0.737501194	0.241672618	4.95%	2.125370174	3.44128921	4.044708865	31.69983898
Nathan Florence Big Wave	big wave	15.25	4.58	15.46608736	4.343103448	0.4511562	0.730530394	0.247659203	1.42%	2.066295394	3.172769072	3.786296375	33.07456112
Machado Tri-Keel Side Larg	keel	16.75	4.59	17.22566575	4.746477273	0.44594267	0.738839217	0.273828109	2.84%	2.046876857	3.50688355	4.06053409	30.27099954
Machado Tri-Keel Center La	keel	15.3	4.12	15.57365288	4.684735202	0.44673601	0.74851873	0.303412676	1.79%	1.84055236	3.506612046	3.960298099	27.69410608
JS Medium Quad Rear	carver rear	11.68	4.09	11.88270704	4.040045802	0.44074137	0.711650372	0.20067883	1.74%	1.802632204	2.875100096	3.393476599	32.08691734
Carver Quad Rear	carver rear	12.63	4.21	12.85166706	4.148360176	0.448989389	0.711912609	0.206011535	1.76%	1.890245327	2.953269918	3.506398523	32.62134303
Al Merrick Medium Quad R	carver rear	11.08	3.99	11.23015572	3.82294686	0.453181473	0.705798283	0.202269444	1.36%	1.808194079	2.698229332	3.248077486	33.82766025
Al Merrick Large Quad Rea	carver rear	12.63	4.26	12.77229321	4.088328358	0.454123084	0.706589263	0.206096219	1.13%	1.934564336	2.888768924	3.476711818	33.80961489
Machado Quad Front	keel	20.98	4.78	20.97900058	4.78	0.454078906	0.878203246	0.667279938	0.00%	2.17049717	4.197811515	4.725746447	27.34142598
Split Keel Quad Front	keel	19.27	4.79	19.41472474	4.705696	0.443453729	0.925233321	0.81343216	0.75%	2.124143364	4.353866736	4.844392695	26.00659789
Machado Quad Rear	keel rear	9.73	3.06	10.09901016	3.486454768	0.436672571	0.847419618	0.612865809	3.79%	1.336218067	2.954490168	3.242605569	24.33566443
Split Keel Quad Rear	keel rear	12.63	4.4	12.89538493	4.082952548	0.436956141	0.677843089	0.143376071	2.10%	1.922607021	2.767601167	3.369871507	34.78707308
Performer Quad Rear	performer rear	12.63	4.26	12.7724509	4.088071749	0.453820742	0.693893933	0.183104754	1.13%	1.933276361	2.836688183	3.432835175	34.27544192
Firewire Large Quad Rear	performer rear	13.11	4.31	13.12504569	4.242232704	0.443621589	0.694306093	0.167848277	0.11%	1.912009049	2.945408013	3.511581832	32.9895827
HS (One Size) Quad Rear	reactor rear	12.63	4.21	13.06438245	4.203640483	0.448111923	0.715263304	0.209145189	3.44%	1.886551196	3.006709779	3.549560411	32.10609457
Christenson Keel	keel	23.64	5.08	24.34398224	4.662985075	0.438991515	0.968641167	1.006528329	2.98%	2.230076898	4.516759303	5.037296653	26.2771121
CI Keel	keel	25.53	5.15	26.84469594	4.472150883	0.453479132	1.076591749	1.352345459	5.15%	2.33541753	4.814680741	5.351198527	25.87625005
Machado Keel	keel	26.54	5.26	27.4883317	4.771958763	0.446691263	0.981395282	1.035211037	3.57%	2.349596045	4.683177814	5.239537767	26.64336747
Modern Keel	keel	25.05	5.5	26.19031622	5.103676471	0.431752589	0.885295147	0.729589861	4.55%	2.374639238	4.518260012	5.104271255	27.72484352
Retro Keel	keel	22.58	4.73	25.95231099	7.50897747	0.429141538	0.678669354	0.127715033	14.93%	2.029839476	5.096112887	5.485491305	21.71795237
Aipa Twin Trailer	trailer	7.91	3.13	7.935912879	3.654093023	0.448812428	0.769774571	0.286056825	0.33%	1.404782901	2.812827889	3.144108098	26.53846623
AM Twin Trailer	trailer	9.46	3.69	9.446409517	3.742155477	0.451344397	0.807437942	0.366286754	-0.14%	1.665460825	3.021558316	3.450155709	28.8632322
MF Twin Trailer	trailer	10.39	3.79	10.55843079	3.763072824	0.449500678	0.709371573	0.198118411	1.62%	1.703607569	2.669416888	3.16671206	32.54580103
MR Twin Trailer	trailer	8.23	3.34	8.323875424	3.666893617	0.447255362	0.714215135	0.166151223	1.14%	1.49383291	2.618950918	3.015035766	29.70015978
Power Twin Trailer	trailer	8.71	3.45	8.885389148	3.536610879	0.450204664	0.797841917	0.363316285	2.01%	1.553206092	2.821656403	3.220899567	28.83097973
Aipa Twin	twin	19.24	5.43	19.32723763	4.849900621	0.446791114	0.749435941	0.270987724	0.45%	2.426075751	3.634689838	4.369990134	33.72224077
AM Twin	twin	20.37	5.61	20.8194609	5.191823394	0.440905772	0.686228229	0.155010923	2.21%	2.473481383	3.562775773	4.337220465	34.77057824
Christenson Twin	twin	19.75	5.22	20.46771238	5.079677419	0.448451739	0.774755725	0.345136723	3.63%	2.340918075	3.935509161	4.57909705	30.74501226
Machado Twin	twin	19.2	5.19	20.07280191	5.147574932	0.451252155	0.719954164	0.227493156	4.55%	2.341998687	3.706018004	4.384008131	32.2906251
MF Twin	twin	20.63	5.32	20.80370476	5.030063371	0.450908235	0.732897572	0.251668156	0.84%	2.398831809	3.686521234	4.398276124	33.05218915
MR Twin	twin	21.06	5.56	21.32882371	5.074379747	0.454802012	0.742833815	0.265530934	1.28%	2.528699188	3.769420864	4.539036598	33.8555086
Power Twin	twin	21.44	5.35	22.45605926	5.545052083	0.452174247	0.7159722	0.208003856	4.74%	2.419132222	3.97010314	4.64907729	31.35551316
Town and Country Twin	twin	22.47	5.77	22.57877988	5.049641533	0.456702591	0.726500307	0.235467961	0.48%	2.635173949	3.668566124	4.516914782	35.6901292
Wade Goodall	balanced	15.34	4.65	15.38949183	4.510582011	0.450746984	0.742665285	0.262454939	0.32%	2.095973474	3.349852676	3.951533595	32.03385445
Timmy Patterson	balanced	15.27	4.63	14.99329987	4.51647986	0.447644668	0.697615867	0.181129422	-1.81%	2.072594813	3.150768015	3.771337739	33.33716779
Quickness Small	balanced	14.51	4.47	14.92833273	4.44630742	0.449132406	0.748772588	0.272049533	2.88%	2.007621856	3.329273112	3.887750631	31.09086259
Quickness Medium	balanced	15.52	4.58	15.59069468	4.571843277	0.449544407	0.742412131	0.257928711	0.46%	2.058913383	3.394191909	3.969844208	31.24095783
Quickness LG	balanced	16.06	4.7	16.40160591	4.601398601	0.450413556	0.744137434	0.267395324	2.13%	2.116943713	3.424072949	4.025633645	31.72655776
Mikey February Thruster	balanced	15.56	4.65	15.7952547	4.60044405	0.449663002	0.735004417	0.249101964	1.51%	2.090932957	3.381346696	3.975613929	31.7315209
Leila Hurst Cheetah	balanced	14.56	4.4	14.50727841	4.506796117	0.448867808	0.732774843	0.24148689	-0.36%	1.975018355	3.302466815	3.847984481	30.88125366
Kaito Ohashi Goemon Med	balanced	15.48	4.55	15.67313799	4.598233216	0.452128719	0.740093075	0.258524875	1.25%	2.057185673	3.403120561	3.976586784	31.15295314
Kaito Ohashi Goemon Larg	balanced	16.73	4.75	17.18146298	4.817615658	0.452765136	0.741465379	0.261504692	2.70%	2.150634397	3.572095222	4.16954345	31.05068463
Josh Hall	balanced	16.52	4.75	16.73103514	4.613577023	0.450159577	0.751372932	0.285424554	1.28%	2.138257991	3.466516896	4.072945694	31.66760694
Dion Agius Flowers	balanced	15.48	4.55	15.25936943	4.501595745	0.447263351	0.71435066	0.216954378	-1.43%	2.035048248	3.215717892	3.80555685	32.32743475
Dane Reynolds Small	balanced	14.56	4.4	14.63143207	4.454130053	0.450031347	0.740810815	0.260366699	0.49%	1.980137927	3.299667715	3.848214292	30.96806286
Dane Reynolds Medium	balanced	15.48	4.55	15.72234001	4.614197531	0.450646016	0.74165656	0.262623226	1.57%	2.050439375	3.422149869	3.989412408	30.92865125
Dane Reynolds Large	balanced	16.73	4.75	17.13490141	4.8170194	0.450646016	0.74165656	0.262623226	2.42%	2.140568578	3.572574039	4.164771195	30.92865125
CF Series XS	balanced	13.39	4.22	13.09664298	4.197671958	0.44841963	0.738882421	0.256523157	-2.19%	1.892330838	3.101586019	3.633283891	31.38808292
CF Series SM	balanced	14.56	4.4	14.32830504	4.392184725	0.449356269	0.740278978	0.259490447	-1.59%	1.977167582	3.25144202	3.805399698	31.30334297
CF Series MD	balanced	15.48	4.55	14.87002058	4.438049209	0.448588378	0.736693168	0.252932837	-3.94%	2.041077118	3.269480532	3.854283169	31.97578184
CF Series LG	balanced	16.73	4.75	16.61575316	4.590828924	0.452442596	0.750982752	0.285947067	-0.68%	2.149102332	3.447633339	4.062612026	31.93759082
Archy Man In Black	balanced	15.35	4.63	15.60387158	4.541271777	0.45392849	0.721531752	0.224749653	1.65%	2.10168891	3.276671784	3.892772052	32.67650432
Wade Goodall Center	balanced center	13.98	4.26	13.89318823	4.336895307	0.454368078	0.766634266	0.316229956	-0.62%	1.935608012	3.324812548	3.847201172	30.20670477
Mikey February Thruster Ce	balanced center	13.98	4.5	14.56798505	4.402877698	0.448901266	0.76172638	0.299817062	4.21%	2.020055698	3.353788089	3.915165331	31.06142214
Leila Hurst Cheetah Center	balanced center	13.51	4.3	13.69088079	4.223758865	0.455770826	0.705271271	0.204101038	1.34%	1.959814552	2.978895782	3.56576684	33.34090462
Kaito Ohashi Goemon Larg	balanced center	14.39	4.4	15.07744257	4.432472325	0.457725608	0.717407421	0.22705051	4.78%	2.013992677	3.179888537	3.764021468	32.34825714
Josh Hall Center	balanced center	14.5	4.55	15.51667211	4.367335766	0.452954278	0.782742359	0.360605346	7.01%	2.060941965	3.418498701	3.991693269	31.0849035
Kaito Ohashi Goemon Med	balanced center	13.82	4.35	14.75153562	4.382103321	0.457871462	0.717608827	0.227269804	6.74%	1.991740859	3.144636026	3.722333594	32.34923857
Dion Agius Flowers Center	balanced center	13.82	4.35	14.13434119	4.24125	0.456936268	0.712758669	0.219631059	2.27%	1.987672764	3.022987703	3.617913441	33.32569188
Dane Reynolds Small Cente	balanced center	12.39	4.2	12.63355947	4.115436242	0.449514782	0.746200315	0.270115703	1.97%	1.887962086	3.07093982	3.60486785	31.58250031
Dane Reynolds Medium Ce	balanced center	13.17	4.34	13.44707744	4.238394649	0.448482512	0.747217643	0.272270382	2.10%	1.946414102	3.167003262	3.717315902	31.5745411
Dane Reynolds Large Cente	balanced center	14.36	4.4	13.85101554	4.296989967	0.448841181	0.747621884	0.273183063	-3.54%	1.974901195	3.212523734	3.771013587	31.58115037
CF Series XS Center	balanced center	12.22	4.09	12.80667187	4.118601399	0.457561478	0.70568572	0.203922973	4.80%	1.871426443	2.906438192	3.456822225	32.77707948
CF Series SM Center	balanced center	13.51	4.3	14.15554443	4.33006993	0.457561478	0.70568572	0.203922973	4.78%	1.967514354	3.055668515	3.634311875	32.77707948
CF Series MD Center	balanced center	13.82	4.35	14.3432238	4.302022059	0.45816898	0.715296563	0.223821358	3.79%	1.993035062	3.077221592	3.666262604	32.93006302
CF Series LG Center	balanced center	14.39	4.4	14.71213937	4.367407407	0.46024986	0.709461192	0.213762033	2.24%	2.025099383	3.098506063	3.701589839	33.16754004
Archy Mann In Black Cente	balanced center	14.83	4.63	15.45913422	4.466971831	0.457365791	0.724394334	0.22800531	4.24%	2.117603613	3.235849084	3.867164899	33.20152869
Evan Rossell Hairy Fools	drive	14.17	4.59	14.34845021	4.378778761	0.443065005	0.772579788	0.309663365	1.26%	2.033668375	3.382955966	3.947175969	31.01223528
Dylan Gravezilla	drive	14.84	4.5	14.7236029	4.45229682	0.454558569	0.721497435	0.224759622	-0.78%	2.045513562	3.212320734	3.80829755	32.48781309
Chemistry Surfboards Pase	drive	14.99	4.73	15.22534683	4.613620387	0.441365119	0.688490941	0.155941463	1.57%	2.087657011	3.176435841	3.80105991	33.31421958
Dylan Gravezilla Center	drive center	13.63	4.34	13.742887	4.388401487	0.449341259	0.728592682	0.235886047	0.83%	1.950141065	3.19735721	3.745149303	31.37996729
Chippa Wilson Bones Smal	pivot	13.8	4.38	13.31224431	4.224955752	0.446873841	0.72674461	0.234019455	-3.53%	1.957307424	3.070463821	3.641263576	32.51600782
Tyler Warren Quad Rear	balanced rear	11.36	3.91	12.02779847	4.305748988	0.441852509	0.666843424	0.124278269	5.88%	1.727643311	2.871260398	3.35095325	31.03540941
Tyler Warren Quad Front	balanced	15.24	4.68	15.87925847	4.581646235	0.454802569	0.690020685	0.173484135	4.19%	2.128476021	3.161430672	3.811174893	33.95094523
Neal Purchase Jr. Quartet (	balanced rear	8.91	3.4	8.933784583	3.616811594	0.437000903	0.686805159	0.139243113	0.27%	1.485803071	2.484044861	2.894492984	30.885272
Neal Purchase Jr. Quartet (	balanced	22.09	5.7	21.80284717	4.764766839	0.443738859	0.758777662	0.324919325	-1.30%	2.529311498	3.615398643	4.412315039	34.97640828
Jeff Mccallum Quad Front	drive	12.38	4.125	13.07936652	3.93784029	0.461555326	0.780759228	0.353830647	5.65%	1.903915722	3.074505146	3.616279437	31.76824505
Jeff Mccallum Quad Especi	drive rear	12.84	4.15	13.87026407	4.072065728	0.460893625	0.810734258	0.434808859	8.02%	1.912708542	3.301363187	3.815423025	30.08668643
Jeff Mccallum Quad Especi	drive	18.95	5.17	19.55831606	4.775833333	0.458889922	0.79295169	0.381109869	3.21%	2.372460899	3.787005114	4.468778183	32.06608107
CF Twin	balanced	18.95	5.15	19.70729332	5.106281834	0.448366102	0.704967291	0.187959625	4.00%	2.309085425	3.599761669	4.276699613	32.67834858
CF Twin Especial	balanced	18.95	5.15	18.5570804	4.801302083	0.453881253	0.750650047	0.27244728	-2.07%	2.337488451	3.604097632	4.295738819	32.96599537
Josh Hall Twin	balanced	22.49	5.58	23.61210358	5.353327571	0.444575632	0.803013633	0.427933353	4.99%	2.480732025	4.298795023	4.963231813	29.98821863
Mikey February Keel	keel	25.99	5.35	25.71552001	4.980397237	0.445606185	0.876399394	0.689439631	-1.06%	2.383993091	4.364817121	4.973434583	28.64265911
Tyler Warren Twin Trailer I	balanced	21.31	5.51	21.0641399	4.527084048	0.452411025	0.849604922	0.548198135	-1.15%	2.492784748	3.846232887	4.583392109	32.94770481
Panda Twin	drive	21.28	5.58	21.50434088	4.644431138	0.449817676	0.801238567	0.430286356	1.05%	2.509982631	3.721297348	4.488659796	33.99932143
CF Keel	keel	25.99	5.35	25.13767262	4.788296041	0.446645295	0.892253363	0.736341227	-3.28%	2.389552331	4.272373244	4.895215366	29.21842783
Christenson Keel Especial	keel	24.18	5.12	24.24987773	5.231401218	0.436424221	0.828167299	0.46536697	0.29%	2.234492009	4.332475419	4.874761307	27.28260691
Jeff Mccallum Keel	keel	24.7	5.1	23.906626	5.144658494	0.44746899	0.909535422	0.772582086	-3.21%	2.282091847	4.679249137	5.206084487	25.99870966
Panda Keel	keel	23.92	5.3	23.89100616	4.80269331	0.43728233	0.983168202	1.033694493	-0.12%	2.317596348	4.721855347	5.259959197	26.1428775
Chippa Wilson NPJ Twin	pivot	22.09	5.7	21.85208623	4.853367876	0.441429019	0.78437118	0.381078567	-1.08%	2.516145406	3.806841889	4.563226148	33.46284866
Christenson Twin	pivot	20.46	5.25	20.45814839	4.83	0.443629606	0.809367741	0.454214486	-0.01%	2.329055432	3.909246187	4.550462059	30.78569132
Christenson Twin Especial	pivot	20.46	5.25	21.23603034	5.388157895	0.440807211	0.739419332	0.261381788	3.79%	2.314237857	3.984108112	4.607473745	30.15090026
Troy Elmore Twin	pivot	21.1	5.65	21.46525486	5.056798623	0.449779484	0.7308029	0.23856266	1.73%	2.541254084	3.695523098	4.484959675	34.51464934
Tyler Warren Twin	pivot	21.12	5.51	23.32815525	5.168067376	0.454433902	0.824861473	0.476130263	10.46%	2.503930803	4.26293967	4.943917889	30.42877743
Tyler Warren Twin Trailer S	pivot	19.44	5.44	19.70462257	4.747125645	0.449272033	0.771425702	0.327113768	1.36%	2.44403986	3.662054731	4.402723668	33.71897888
CF Twin Trailer	trailer	6.7	3	7.031557617	3.075	0.453179392	0.740009545	0.254870283	4.95%	1.359538176	2.275529352	2.650731575	30.85663592
CF Twin Especial Trailer	trailer	6.7	3	6.512850108	2.859649123	0.454286218	0.767770308	0.313141421	-2.79%	1.362858654	2.195553687	2.584151641	31.82935286

Tyler Warren Twin Trailer I	trailer	9.17	3.625	9.101068159	3.761150235	0.429892434	0.698117844	0.158484149		-0.75%	1.558360074	2.625726092	3.053346301	30.68899604
Panda Trailer	trailer	5.32	2.63	5.554209743	2.842720588	0.438101797	0.670302854	0.121222988		4.40%	1.152207725	1.905483722	2.226757925	31.16051062
Chippa Wilson NPJ Twin Tr	trailer	8.91	3.4	9.328473968	3.661538462	0.439938795	0.692347326	0.161119683		4.70%	1.495791904	2.535056363	2.943451067	30.54242638
Troy Elmore Twin Trailer	trailer	9.06	3.7	9.375920034	3.370680628	0.452552014	0.730544393	0.239784146		3.49%	1.674442451	2.462431834	2.977805914	34.215524
Tyler Warren Twin Trailer '	trailer	8.8	3.65	9.492905211	3.372991071	0.453444328	0.802021411	0.400075383		7.87%	1.655071797	2.70521106	3.171345066	31.45865962
Cutaway 7	cutaway hatchet	24.7	7	25.23216214	3.325	0.498218545	1.219039667	1.588589803		2.15%	3.487529818	4.053306893	5.347163827	40.70922735
Honeycomb Hatchet	cutaway hatchet	16.13	5.94	15.92456836	2.53125	0.532495792	1.353485261	1.706289119		-1.27%	3.163025005	3.426009567	4.662860574	42.71439778
Solus Hatchet	cutaway hatchet	13	4.72	12.82813251	3.352101911	0.484898183	0.828504457	0.456185491		-1.32%	2.288719423	2.777231374	3.598784615	39.4919724
Admiral 7.5	flex	22.8	7.5	22.75688723	4.541015625	0.438926538	0.842537452	0.429213172		-0.19%	3.291949032	3.825975736	5.047278352	40.70938709
Admiral 8.5	flex	29.3	8.5	29.20438611	5.137632339	0.437521726	0.839925635	0.424105092		-0.33%	3.718934667	4.315229103	5.696637365	40.75529848
Admiral 9.5	flex	36.6	9.5	36.43676653	5.718181818	0.438277758	0.838112906	0.419148714		-0.45%	4.163638699	4.792481979	6.348525083	40.98363705
Tiller 10	flex	40.6	10	40.574063	7.790973872	0.415293362	0.790397935	0.289393959		-0.06%	4.152933625	6.157969662	7.427479253	33.99571931
Tiller 8	flex	25.9	8	25.69342632	6.243667069	0.413843664	0.789018085	0.285314641		-0.80%	3.310749315	4.926366232	5.935498739	33.9029532
Tiller 9	flex	32.9	9	33.16593188	7.040669856	0.415908878	0.791161666	0.291910969		0.81%	3.743179905	5.570308096	6.711164436	33.90062502
Honeycomb Hatchet Side	neutral sidebight	14.22	4.37	14.27459924	4.219310345	0.46096418	0.739795918	0.264540868		0.38%	2.014413467	3.121428571	3.714993667	32.83616968
HS Plunder 7	performance	25.5	7	26.05891339	5.196123147	0.460158326	0.729195278	0.237663068		2.19%	3.221108283	3.788988462	4.973124987	40.36864564
Techflex 2+1	performance	27.9	6.88	28.83726563	5.335143603	0.47395959	0.822651834	0.407924536		3.36%	3.260841976	4.388965671	5.467733539	36.61100717
Performance 4.5	performance longbo:	13.5	4.6	15.75816228	4.556190476	0.46180958	0.731311518	0.24524387		16.73%	2.124324066	3.331994572	3.951574441	32.51968112
Performance 6	performance longbo:	20	6	19.5295199	4.595588235	0.450543119	0.742463598	0.262259865		-2.35%	2.703258713	3.412056977	4.353129964	38.38860897
Performance 7	performance longbo:	24.5	7	24.53011759	4.84962406	0.465679238	0.770224122	0.30542197		0.12%	3.259754664	3.735297433	4.957665518	41.11086029
Performance 8	performance longbo:	31.5	8	31.43035422	5.56223176	0.460348693	0.741418368	0.260553202		-0.22%	3.682789544	4.123940792	5.528998686	41.76570722
Performance 9	performance longbo:	39.8	9	40.27695756	6.250528541	0.461679893	0.74839238	0.270269383		1.20%	4.15511904	4.677847929	6.256778363	41.61322533
Ando 7.8	pivot	29.7	7.8	29.70983878	5.318181818	0.463226035	0.743759627	0.279334983		0.03%	3.613163076	3.955448926	5.357286964	42.41059776
Lost 6.25	pivot	23.67	6.25	23.90740077	5.341695502	0.450663534	0.710390453	0.20594838		1.00%	2.816647087	3.794689485	4.72579825	36.58502971
Rudder 10	pivot	55.1	10	56.02928948	7.813953488	0.457558909	0.724215013	0.20039309		1.69%	4.575589086	5.658982424	7.277368862	38.95738697
Bark RFD	prone racing	27.03	6.84	27.27972885	5.672195122	0.442818303	0.762414968	0.272233369		0.92%	3.028877194	4.324566464	5.279770086	35.00696179
Bark 8.75	sup	56.6	8.75	56.39289991	8.097278226	0.456076694	0.900784191	0.690476774		-0.37%	3.990671068	7.293900215	8.314230928	28.68414691
Triangle Cutaway	sup	44	7.5	44.05422999	7.925257732	0.450536871	1.018141557	1.111471021		0.12%	3.379026532	8.069034251	8.747978855	22.72221368
Lost 3.625 Twin Trailer	trailer	9.63	3.625	9.51106949	2.048412698	0.461219501	1.169499347	1.667801187		-1.24%	1.671920692	2.395617313	2.921352617	34.91149958
Gerry 7.75	triangle	28.9	7.8	29.32870406	5.476956522	0.432383028	0.739922212	0.249175098		1.48%	3.372587615	4.052521787	5.272312591	39.76788707
Gerry 8.5	triangle	35.22	8.55	36.03866932	6.172732697	0.429710785	0.715569044	0.200996934		2.32%	3.674027211	4.417016435	5.745303311	39.75332319
Gerry 9.7 Flex	triangle	43.85	9.72	45.03233001	6.719577465	0.440042814	0.759118252	0.280898694		2.70%	4.27721615	5.100953897	6.656899327	39.98027024
Machado 7.5	triangle	27.5	7.5	27.37725863	6.230620155	0.411045158	0.659704179	0.10334666		-0.45%	3.082838688	4.110366152	5.137996135	36.87046925
Machado 8.5	triangle	35.3	8.5	35.68188668	7.128335451	0.411822262	0.663398229	0.106639286		1.08%	3.500489231	4.728925113	5.883549743	36.50993179
Carver Side Bite	carver	11.07	3.93	11.45206553	3.988851913	0.447322634	0.700845811	0.182794844		3.45%	1.75797795	2.795570156	3.302377775	32.16349439
Harley Longboard Center	longboard	18.5	5.27	17.07175569	4.643111111	0.443061865	0.679568907	0.153517077		-7.72%	2.33493603	3.155313943	3.925293918	36.50148468
Hatchet 10	longboard	50.91	10.01	51.95445733	6.842814815	0.467258913	0.804467081	0.374056298		2.05%	4.677261719	5.50481926	7.223559529	40.35344877
Kelia Moniz	longboard	39.56	9.75	39.31297746	7.029315961	0.427973934	0.737699776	0.22667992		-0.62%	4.172745856	5.185524813	6.655935363	38.82332529
Whip 8	longboard	30.03	7.99	30.90612149	6.974877049	0.42118676	0.761325654	0.225736754		2.92%	3.365282212	5.310152828	6.286719926	32.36427013
Clique 8	neutral	28.67	8.01	29.88423352	5.63462069	0.441298717	0.770808838	0.297301916		4.24%	3.534802727	4.343215429	5.599852728	39.14102955
Connect SF 8	neutral	30.71	7.96	32.30671725	5.899123288	0.450890268	0.767474757	0.291960551		5.20%	3.589086532	4.527428214	5.777469028	38.40537158
Pivot 8	pivot	29.5	8.01	29.15152485	4.823866171	0.454751479	0.812120197	0.38185965		-1.18%	3.642559347	3.917559145	5.349346526	42.9167808
Harley Longboard Side	sidebite	16.93	4.99	16.84128206	4.588120805	0.449286901	0.723350811	0.229829397		-0.52%	2.241941637	3.318820905	4.005106054	34.03995227
Danny Ching 9	sup	44.1	8.64	45.22222772	7.798604651	0.404498445	0.703926651	0.161737106		2.54%	3.494866562	5.489645652	6.50771094	32.48200494
Dave Kalama 9	sup	45.2	9.16	44.37130111	6.711053985	0.450115517	0.885903371	0.605938198		-1.83%	4.123058137	5.945345348	7.235104678	34.74105528
Eric Terrien 8.5	sup	37.99	8.51	38.20316966	7.105436893	0.410699295	0.828226702	0.436461401		0.56%	3.495051001	5.884912564	6.844529011	30.70608667
Slasher 7	balanced	26.3	7	23.82765198	4.936206897	0.459564597	0.710527337	0.226014339		-9.40%	3.216952176	3.50730994	4.759202067	42.52746906
Raked 8.5	balanced	34.76	8.5	35.93239944	7.193412162	0.431875274	0.73129276	0.227494527		3.37%	3.670939828	5.260490233	6.414714079	34.90857829
Slasher El Bull 6.5	balanced	19.91	6.5	20.30370287	4.511363636	0.462162379	0.728148594	0.25570825		1.98%	3.004055461	3.28494309	4.451426773	42.44267914
Alex Knost Classic 9.5	balanced	37.96	9.5	39.45096681	6.588184932	0.417970602	0.745124546	0.241765793		3.93%	3.970720715	4.909018309	6.313880246	38.96809602
Josh Hall 7.5	balanced	31.31	7.5	31.9793006	5.673241852	0.455568224	0.827744378	0.437417825		2.14%	3.416761678	4.695994049	5.807462481	36.03928811
JJ Wessels Splash 9.75	balanced	51.62	9.75	52.17866037	7.949251248	0.450245001	0.72525687	0.210516996		1.08%	4.38988876	5.765249083	7.246324607	37.28708036
Alex Knost 6.5	bonzer	23.01	6.5	23.25270681	5.448695652	0.43541625	0.73155635	0.223079786		1.05%	2.830205626	3.986027902	4.888607401	35.37595419
Evan Rossell Hairy Fools 1(	drive	53.14	10	52.58475348	6.760797342	0.471144167	0.665936727	0.146608053		-1.04%	4.711441669	4.502263255	6.51675203	46.30056062
Natas Kaupas 10	drive	53.14	10	53.49669559	6.914191419	0.471062705	0.672672741	0.152690797		0.67%	4.710627049	4.650988093	6.619795876	45.36500264
Christenson Tracker 8	drive	27.33	8	28.94466505	5.926421405	0.439520016	0.714061915	0.207610761		5.91%	3.516160126	4.231831818	5.501979877	39.72263995
Christenson Tracker 8.5	drive	30.85	8.5	30.53857143	5.914285714	0.440689293	0.720721598	0.218385447		-1.01%	3.745858986	4.26255345	5.674576765	41.30845233
Christenson Tracker 9	drive	34.59	9	34.49310623	6.24120603	0.44153728	0.727195029	0.228869765		-0.28%	3.973835516	4.538574002	6.032414332	41.20439024
Christenson Tracker 9.5	drive	38.54	9.5	38.5292605	6.65	0.443376524	0.7322589	0.23649655		-0.03%	4.212076974	4.869521686	6.438465181	40.85940642
Christenson Tracker 10	drive	42.7	10	43.36017204	7.138103161	0.441047296	0.723398342	0.223736207		1.55%	4.410472958	5.163691993	6.790875253	40.50168964
Tyler Warren Raked 8	drive	31.68	8	32.12272535	5.84040747	0.450876657	0.748611624	0.258372938		1.40%	3.607013253	4.37219692	5.668037625	39.52224759
Tyler Warren Raked 9.25	drive	36.48	9.25	37.33106958	6.073701843	0.448762604	0.795918704	0.33347697		2.33%	4.151054084	4.834172897	6.371850407	40.65234413
Andy Davis Bolts 10	drive	53.14	10	53.87303414	7.023411371	0.469919854	0.664378765	0.139590219		1.38%	4.699198544	4.666205375	6.622381714	45.20184516
Pivot 9.5	pivot	46.69	9.5	47.90051713	6.955074875	0.457747918	0.750156126	0.267819855		2.59%	4.348605222	5.217392023	6.792020826	39.81061641
Alex Knost Classic 7.5	pivot	23.66	7.5	24.63841551	5.206185567	0.418366782	0.748395067	0.246934747		4.14%	3.137750868	3.896283596	5.002649935	38.84515065
Alex Knost Classic 8.5	pivot	30.39	8.5	31.58262994	5.894691781	0.417970602	0.745124546	0.241765793		3.92%	3.552750114	4.39227954	5.649261272	38.96809602
Jeff Mccallum 7.5	pivot	26.03	7.5	27.38490043	5.369170984	0.438619733	0.776620375	0.317062425		5.21%	3.289647996	4.169807585	5.31122201	38.27064355
Jeff Mccallum 9	pivot	34.99	9	36.287242	6.155877342	0.422882615	0.790445283	0.334839417		3.71%	3.805943537	4.865884211	6.177542826	38.03141376
Joel Tudor 9.5	pivot	48.81	9.5	49.91159789	7.36409396	0.475670695	0.734823912	0.268136495		2.26%	4.518871604	5.411312333	7.050000124	39.86453772
Joel Tudor 10.125	pivot	53.09	10.125	53.07055928	7.003125	0.474154577	0.770554818	0.308174351		-0.04%	4.800815091	5.396291707	7.222727305	41.65791545
Tyler Warren Pivot 9.75	pivot	47.44	9.75	49.27757777	8.208818636	0.436741968	0.687868545	0.138919176		3.87%	4.25823419	5.646588134	7.072235571	37.02086516
Tyler Warren Pivot 10.25	pivot	52.64	10.25	57.44669509	9.045115894	0.438437193	0.692540546	0.149768001		9.13%	4.493981228	6.264109504	7.709405629	35.65631567
Tyler Warren Pivot 10.5	pivot	52.22	10.5	56.91369599	8.840266223	0.43703621	0.69779954	0.148520005		8.99%	4.588880208	6.168733703	7.68837415	36.64531529
Pivot 10	pivot	52.86	10	53.51570178	7.387687188	0.457591717	0.744986386	0.257515532		1.24%	4.575917165	5.50372638	7.157515069	39.74086818
CZ Crash Helmet 10	pivot	52.48	10	55.07552419	8.525963149	0.436688585	0.70029839	0.14696484		4.95%	4.36688585	5.970718267	7.397240611	36.18112809
Alex Knost Sunshine 10	raked	40.1	10	42.66973299	8.145973154	0.409837017	0.655003645	0.105741994		6.41%	4.09837017	5.335642105	6.727979989	37.528295
CF Raked 9.5	raked	43.45	9.5	44.46412678	7.990802676	0.43163327	0.735184076	0.230238879		2.33%	4.10051606	5.87471088	7.164248732	34.9148301
Scotty Stopnik 9.8	raked	46.74	9.8	46.97418272	8.294824708	0.428959755	0.725600597	0.216135915		0.50%	4.2038056	6.018729758	7.341463711	34.93252607
Jeff Mccallum 8	raked	33.83	8	35.4135314	6.530612245	0.455005012	0.794743751	0.345346362		4.68%	3.6400401	5.19016327	6.339375892	35.04330087
Joel Tudor 8.5*	raked	25.2	8.5	29.5353587	5.486230637	0.436196135	0.795388467	0.336993316		17.20%	3.707667145	4.363684577	5.726127727	40.35336938
Joel Tudor 9.125*	raked	32.22	9.125	37.38680946	6.766680743	0.427551209	0.663909219	0.130411592		16.04%	3.901404784	4.49246173	5.950056444	40.97214668
Joel Tudor 9.625*	raked	36.88	9.625	42.04007488	6.858823529	0.423548577	0.679061844	0.150356141		13.99%	4.076655053	4.657565353	6.189671352	41.19487951
Josh Hall Side Bites	side bites	6.77	2.75	6.652044452	3.370714286	0.43098157	0.645957872	0.074173948		-1.74%	1.185199317	2.177339426	2.479012787	28.56094403

t-Test Tabulations

Depth Ratio			
	Captain Fin (8)	FCS (7)	Futures (9)
Number of t-Tests	28	21	36
Not Statistically Significant	20	12	11
Significant at alpha = 0.10	8	9	25
Significant at alpha = 0.05	5	6	19
Significant at alpha = 0.01	3	4	12
Width Ratio			
	Captain Fin (8)	FCS (7)	Futures (9)
Number of t-Tests	28	21	36
Not Statistically Significant	17	12	22
Significant at alpha = 0.10	11	9	14
Significant at alpha = 0.05	7	8	13
Significant at alpha = 0.01	6	2	8
Rake Ratio			
	Captain Fin (8)	FCS (7)	Futures (9)
Number of t-Tests	28	21	36
Not Statistically Significant	15	13	20
Significant at alpha = 0.10	13	8	16
Significant at alpha = 0.05	10	8	10
Significant at alpha = 0.01	7	3	8
Angle			
	Captain Fin (8)	FCS (7)	Futures (9)
Number of t-Tests	28	21	36
Not Statistically Significant	6	6	11
Significant at alpha = 0.10	22	15	25
Significant at alpha = 0.05	21	14	22
Significant at alpha = 0.01	21	13	16

Depth Ratio			
	Captain Fin (8)	FCS (7)	Futures (9)
Number of t-Tests	28	21	36
Not Statistically Significant	71.43%	57.14%	30.56%

Significant at alpha = 0.10	28.57%	42.86%	69.44%
Significant at alpha = 0.05	17.86%	28.57%	52.78%
Significant at alpha = 0.01	10.71%	19.05%	33.33%
Width Ratio			
	Captain Fin (8)	FCS (7)	Futures (9)
Number of t-Tests	28	21	36
Not Statistically Significant	60.71%	57.14%	61.11%
Significant at alpha = 0.10	39.29%	42.86%	38.89%
Significant at alpha = 0.05	25.00%	38.10%	36.11%
Significant at alpha = 0.01	21.43%	9.52%	22.22%
Rake Ratio			
	Captain Fin (8)	FCS (7)	Futures (9)
Number of t-Tests	28	21	36
Not Statistically Significant	53.57%	61.90%	55.56%
Significant at alpha = 0.10	46.43%	38.10%	44.44%
Significant at alpha = 0.05	35.71%	38.10%	27.78%
Significant at alpha = 0.01	25.00%	14.29%	22.22%
Angle			
	Captain Fin (8)	FCS (7)	Futures (9)
Number of t-Tests	28	21	36
Not Statistically Significant	21.43%	28.57%	30.56%
Significant at alpha = 0.10	78.57%	71.43%	69.44%
Significant at alpha = 0.05	75.00%	66.67%	61.11%
Significant at alpha = 0.01	75.00%	61.90%	44.44%

Depth Ratio:

= Statistically Significat at alpha = 0.1
= Statistically Significat at alpha = 0.05
= Statistically Significat at alpha = 0.01

Captain Fin

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	*CF Balanced Longboard*
Mean	0.449906365	0.446231013
Variance	7.1599E-06	0.000307925
Observations	24	6
Hypothesized Mean Difference	0	
df	5	
t Stat	0.511556194	
P(T<=t) two-tail	0.630745034	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	*CF Drive*
Mean	0.449906365	0.451541937
Variance	7.1599E-06	6.8352E-05
Observations	24	6
Hypothesized Mean Difference	0	
df	5	
t Stat	-0.478361282	
P(T<=t) two-tail	0.652577287	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	*CF Drive Longboard*
Mean	0.449906365	0.451793639
Variance	7.1599E-06	0.000183311
Observations	24	10
Hypothesized Mean Difference	0	
df	9	
t Stat	-0.43725518	
P(T<=t) two-tail	0.672230448	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	*CF Keel*
Mean	0.449906365	0.442685405
Variance	7.1599E-06	2.88725E-05
Observations	24	5
Hypothesized Mean Difference	0	
df	4	
t Stat	2.930213819	
P(T<=t) two-tail	0.042804681	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	*CF Pivot*
Mean	0.449906365	0.446603585
Variance	7.1599E-06	2.46354E-05
Observations	24	7
Hypothesized Mean Difference	0	
df	7	
t Stat	1.690364024	
P(T<=t) two-tail	0.134803296	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	*CF Pivot Longboard*
Mean	0.449906365	0.44265905
Variance	7.1599E-06	0.000387232
Observations	24	12
Hypothesized Mean Difference	0	
df	11	
t Stat	1.269942127	
P(T<=t) two-tail	0.230311747	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	*CF Raked*
Mean	0.449906365	0.430390139
Variance	7.1599E-06	0.000186748
Observations	24	7
Hypothesized Mean Difference	0	
df	6	
t Stat	3.75752329	
P(T<=t) two-tail	0.009425942	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced Longboard	*CF Drive*
Mean	0.446231013	0.451541937
Variance	0.000307925	6.8352E-05
Observations	6	6
Hypothesized Mean Difference	0	
df	7	
t Stat	-0.670643447	
P(T<=t) two-tail	0.523950362	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced Longboard	*CF Drive Longboard*
Mean	0.446231013	0.451793639
Variance	0.000307925	0.000183311
Observations	6	10
Hypothesized Mean Difference	0	
df	9	
t Stat	-0.666519899	
P(T<=t) two-tail	0.52179644	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced Longboard	*CF Keel*
Mean	0.446231013	0.442685405
Variance	0.000307925	2.88725E-05
Observations	6	5
Hypothesized Mean Difference	0	
df	6	
t Stat	0.469234727	
P(T<=t) two-tail	0.655467854	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced Longboard	*CF Pivot*
Mean	0.446231013	0.446603585
Variance	0.000307925	2.46354E-05
Observations	6	7
Hypothesized Mean Difference	0	
df	6	
t Stat	-0.050310805	
P(T<=t) two-tail	0.961507755	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced Longboard	*CF Pivot Longboard*
Mean	0.446231013	0.44265905
Variance	0.000307925	0.000387232
Observations	6	12
Hypothesized Mean Difference	0	
df	11	
t Stat	0.390687243	
P(T<=t) two-tail	0.703488724	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced Longboard	*CF Raked*
Mean	0.446231013	0.430390139
Variance	0.000307925	0.000186748
Observations	6	7
Hypothesized Mean Difference	0	
df	9	
t Stat	1.79363461	
P(T<=t) two-tail	0.106457426	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive	*CF Drive Longboard*
Mean	0.451541937	0.451793639
Variance	6.8352E-05	0.000183311

FCS

t-Test: Two-Sample Assuming Unequal Variances

	FCS Accelerator	*FCS Carver*
Mean	0.448529111	0.449477958
Variance	7.51058E-05	4.0972E-06
Observations	8	9
Hypothesized Mean Difference	0	
df	8	
t Stat	-0.302428175	
P(T<=t) two-tail	0.770039461	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Accelerator	*FCS Keel*
Mean	0.448529111	0.44336304
Variance	7.51058E-05	7.53057E-05
Observations	8	9
Hypothesized Mean Difference	0	
df	15	
t Stat	1.226008981	
P(T<=t) two-tail	0.239095329	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Accelerator	*FCS Neutral Longboard*
Mean	0.448529111	0.441945076
Variance	7.51058E-05	0.000269714
Observations	8	6
Hypothesized Mean Difference	0	
df	7	
t Stat	0.893161061	
P(T<=t) two-tail	0.401432502	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Accelerator	*FCS Performer*
Mean	0.448529111	0.456924648
Variance	7.51058E-05	3.86136E-07
Observations	8	3
Hypothesized Mean Difference	0	
df	7	
t Stat	-2.721447457	
P(T<=t) two-tail	0.029703406	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Accelerator	*FCS Reactor*
Mean	0.448529111	0.450785612
Variance	7.51058E-05	1.15201E-05
Observations	8	7
Hypothesized Mean Difference	0	
df	9	
t Stat	-0.679312979	
P(T<=t) two-tail	0.514028945	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Accelerator	*FCS Twin*
Mean	0.448529111	0.450248483
Variance	7.51058E-05	2.4287E-05
Observations	8	8
Hypothesized Mean Difference	0	
df	11	
t Stat	-0.487795035	
P(T<=t) two-tail	0.635271942	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Carver	*FCS Keel*
Mean	0.449477958	0.44336304
Variance	4.0972E-06	7.53057E-05
Observations	9	9
Hypothesized Mean Difference	0	
df	9	
t Stat	2.058703109	
P(T<=t) two-tail	0.069626169	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Carver	*FCS Neutral Longboard*
Mean	0.449477958	0.441945076
Variance	4.0972E-06	0.000269714
Observations	9	6
Hypothesized Mean Difference	0	
df	5	
t Stat	1.117883731	
P(T<=t) two-tail	0.31443105	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Carver	*FCS Performer*
Mean	0.449477958	0.456924648
Variance	4.0972E-06	3.86136E-07
Observations	9	3
Hypothesized Mean Difference	0	
df	10	
t Stat	-9.744802422	
P(T<=t) two-tail	2.01351E-06	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Carver	*FCS Reactor*
Mean	0.449477958	0.450785612
Variance	4.0972E-06	1.15201E-05
Observations	9	7
Hypothesized Mean Difference	0	
df	9	
t Stat	-0.902156984	
P(T<=t) two-tail	0.390478427	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Carver	*FCS Twin*
Mean	0.449477958	0.450248483
Variance	4.0972E-06	0.000024287
Observations	9	8
Hypothesized Mean Difference	0	
df	9	
t Stat	-0.412386109	
P(T<=t) two-tail	0.689706301	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Keel	*FCS Neutral Longboard*
Mean	0.44336304	0.441945076
Variance	7.53057E-05	0.000269714
Observations	9	6
Hypothesized Mean Difference	0	
df	7	
t Stat	0.194187488	
P(T<=t) two-tail	0.851544296	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Keel	*FCS Performer*
Mean	0.44336304	0.456924648
Variance	7.53057E-05	3.86136E-07
Observations	9	3
Hypothesized Mean Difference	0	
df	8	
t Stat	-4.652684678	
P(T<=t) two-tail	0.00163895	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Keel	*FCS Reactor*
Mean	0.44336304	0.450785612
Variance	7.53057E-05	1.15201E-05

Futures

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	*Futures Flex Longboard*
Mean	0.505204173	0.426628654
Variance	0.000602982	0.000162491
Observations	3	6
Hypothesized Mean Difference	0	
df	3	
t Stat	5.202923619	
P(T<=t) two-tail	0.013797174	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	*Futures Keel*
Mean	0.505204173	0.450134172
Variance	0.000602982	3.56281E-05
Observations	3	4
Hypothesized Mean Difference	0	
df	2	
t Stat	3.801085974	
P(T<=t) two-tail	0.062766544	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	*Futures Neutral*
Mean	0.505204173	0.455412578
Variance	0.000602982	2.67607E-05
Observations	3	25
Hypothesized Mean Difference	0	
df	2	
t Stat	3.502764852	
P(T<=t) two-tail	0.072724658	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	*Futures Performance Longboard*
Mean	0.505204173	0.462025491
Variance	0.000602982	4.90136E-05
Observations	3	7
Hypothesized Mean Difference	0	
df	2	
t Stat	2.993931324	
P(T<=t) two-tail	0.09579948	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	*Futures Pivot*
Mean	0.505204173	0.452191686
Variance	0.000602982	8.58278E-05
Observations	3	16
Hypothesized Mean Difference	0	
df	2	
t Stat	3.690346531	
P(T<=t) two-tail	0.06621843	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	*Futures Pivot Longboard*
Mean	0.505204173	0.457149493
Variance	0.000602982	3.95798E-05
Observations	3	3
Hypothesized Mean Difference	0	
df	2	
t Stat	3.283513041	
P(T<=t) two-tail	0.08156474	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	*Futures Rake*
Mean	0.505204173	0.452524717
Variance	0.000602982	1.03183E-05
Observations	3	16
Hypothesized Mean Difference	0	
df	2	
t Stat	3.709829997	
P(T<=t) two-tail	0.065591471	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	*Futures Triangle Longboard*
Mean	0.505204173	0.45000809
Variance	0.000602982	0.000167844
Observations	3	5
Hypothesized Mean Difference	0	
df	3	
t Stat	5.236762184	
P(T<=t) two-tail	0.01355246	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	*Futures Keel*
Mean	0.426628654	0.450134172
Variance	0.000162491	3.56281E-05
Observations	6	4
Hypothesized Mean Difference	0	
df	7	
t Stat	-3.918189176	
P(T<=t) two-tail	0.005762434	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	*Futures Neutral*
Mean	0.426628654	0.455412578
Variance	0.000162491	2.67607E-05
Observations	6	25
Hypothesized Mean Difference	0	
df	5	
t Stat	-5.4249141	
P(T<=t) two-tail	0.002883647	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	*Futures Performance Longboard*
Mean	0.426628654	0.462025491
Variance	0.000162491	4.90136E-05
Observations	6	7
Hypothesized Mean Difference	0	
df	8	
t Stat	-6.063036866	
P(T<=t) two-tail	0.00030153	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	*Futures Pivot*
Mean	0.426628654	0.452191686
Variance	0.000162491	8.58278E-05
Observations	6	16
Hypothesized Mean Difference	0	
df	7	
t Stat	-4.487772825	
P(T<=t) two-tail	0.002839658	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	*Futures Pivot Longboard*
Mean	0.426628654	0.457149493
Variance	0.000162491	3.95798E-05
Observations	6	3
Hypothesized Mean Difference	0	
df	7	
t Stat	-4.80925433	
P(T<=t) two-tail	0.001945402	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	*Futures Rake*
Mean	0.426628654	0.452524717
Variance	0.000162491	1.03183E-05

Observations	6	10
Hypothesized Mean Difference	0	
df	14	
t Stat	-0.046167986	
P(T<=t) two-tail	0.963828459	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive	*CF Keel*
Mean	0.451541937	0.442685405
Variance	6.8352E-05	2.88725E-05
Observations	6	5
Hypothesized Mean Difference	0	
df	9	
t Stat	2.137581741	
P(T<=t) two-tail	0.061261688	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive	*CF Pivot*
Mean	0.451541937	0.446603585
Variance	6.8352E-05	2.46354E-05
Observations	6	7
Hypothesized Mean Difference	0	
df	8	
t Stat	1.278861614	
P(T<=t) two-tail	0.236793302	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive	*CF Pivot Longboard*
Mean	0.451541937	0.44265905
Variance	6.8352E-05	0.000387232
Observations	6	12
Hypothesized Mean Difference	0	
df	16	
t Stat	1.344329272	
P(T<=t) two-tail	0.197593219	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive	*CF Raked*
Mean	0.451541937	0.430390139
Variance	6.8352E-05	0.000186748
Observations	6	7
Hypothesized Mean Difference	0	
df	10	
t Stat	3.428103218	
P(T<=t) two-tail	0.006459006	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive Longboard	*CF Keel*
Mean	0.451793639	0.442685405
Variance	0.000183311	2.88725E-05
Observations	10	5
Hypothesized Mean Difference	0	
df	13	
t Stat	1.855132953	
P(T<=t) two-tail	0.086390221	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive Longboard	*CF Pivot*
Mean	0.451793639	0.446603585
Variance	0.000183311	2.46354E-05
Observations	10	7
Hypothesized Mean Difference	0	
df	12	
t Stat	1.110303168	
P(T<=t) two-tail	0.288621712	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive Longboard	*CF Pivot Longboard*
Mean	0.451793639	0.44265905
Variance	0.000183311	0.000387232
Observations	10	12
Hypothesized Mean Difference	0	
df	19	
t Stat	1.284138537	
P(T<=t) two-tail	0.214532008	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive Longboard	*CF Raked*
Mean	0.451793639	0.430390139
Variance	0.000183311	0.000186748
Observations	10	7
Hypothesized Mean Difference	0	
df	13	
t Stat	3.190310206	
P(T<=t) two-tail	0.007098787	

t-Test: Two-Sample Assuming Unequal Variances

	CF Keel	*CF Pivot*
Mean	0.442685405	0.446603585
Variance	2.88725E-05	2.46354E-05
Observations	5	7
Hypothesized Mean Difference	0	
df	8	
t Stat	-1.285247009	
P(T<=t) two-tail	0.234663167	

t-Test: Two-Sample Assuming Unequal Variances

	CF Keel	*CF Pivot Longboard*
Mean	0.442685405	0.44265905
Variance	2.88725E-05	0.000387232
Observations	5	12
Hypothesized Mean Difference	0	
df	14	
t Stat	0.004272951	
P(T<=t) two-tail	0.996650979	

t-Test: Two-Sample Assuming Unequal Variances

	CF Keel	*CF Raked*
Mean	0.442685405	0.430390139
Variance	2.88725E-05	0.000186748
Observations	5	7
Hypothesized Mean Difference	0	
df	8	
t Stat	2.158298676	
P(T<=t) two-tail	0.062956062	

t-Test: Two-Sample Assuming Unequal Variances

	CF Pivot	*CF Pivot Longboard*
Mean	0.446603585	0.44265905
Variance	2.46354E-05	0.000387232
Observations	7	12
Hypothesized Mean Difference	0	
df	13	
t Stat	0.659360728	
P(T<=t) two-tail	0.521173804	

t-Test: Two-Sample Assuming Unequal Variances

	CF Pivot	*CF Raked*
Mean	0.446603585	0.430390139
Variance	2.46354E-05	0.000186748
Observations	7	7
Hypothesized Mean Difference	0	
df	8	
t Stat	2.950451641	
P(T<=t) two-tail	0.018412971	

t-Test: Two-Sample Assuming Unequal Variances

	CF Pivot Longboard	*CF Raked*
Mean	0.44265905	0.430390139
Variance	0.000387232	0.000186748
Observations	12	7
Hypothesized Mean Difference	0	

Observations	9	7
Hypothesized Mean Difference	0	
df	11	
t Stat	-2.345695306	
P(T<=t) two-tail	0.038780729	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Keel	*FCS Twin*
Mean	0.44336304	0.450248483
Variance	7.53057E-05	2.4287E-05
Observations	9	8
Hypothesized Mean Difference	0	
df	13	
t Stat	-2.039007888	
P(T<=t) two-tail	0.062318817	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Neutral Longboard	*FCS Performer*
Mean	0.441945076	0.456924648
Variance	0.000269714	3.86136E-07
Observations	6	3
Hypothesized Mean Difference	0	
df	5	
t Stat	-2.231012715	
P(T<=t) two-tail	0.076068202	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Neutral Longboard	*FCS Reactor*
Mean	0.441945076	0.450785612
Variance	0.000269714	1.15201E-05
Observations	6	7
Hypothesized Mean Difference	0	
df	5	
t Stat	-1.295073102	
P(T<=t) two-tail	0.251866723	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Neutral Longboard	*FCS Twin*
Mean	0.441945076	0.450248483
Variance	0.000269714	2.4287E-05
Observations	6	8
Hypothesized Mean Difference	0	
df	6	
t Stat	-1.198639787	
P(T<=t) two-tail	0.275857946	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Performer	*FCS Reactor*
Mean	0.456924648	0.450785612
Variance	3.86136E-07	1.15201E-05
Observations	3	7
Hypothesized Mean Difference	0	
df	7	
t Stat	4.608599991	
P(T<=t) two-tail	0.002459039	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Performer	*FCS Twin*
Mean	0.456924648	0.450248483
Variance	3.86136E-07	2.4287E-05
Observations	3	8
Hypothesized Mean Difference	0	
df	8	
t Stat	3.752910534	
P(T<=t) two-tail	0.00560085	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Reactor	*FCS Twin*
Mean	0.450785612	0.450248483
Variance	1.15201E-05	2.4287E-05
Observations	7	8
Hypothesized Mean Difference	0	
df	12	
t Stat	0.248245103	
P(T<=t) two-tail	0.808142049	

Observations	6	16
Hypothesized Mean Difference	0	
df	5	
t Stat	-4.917947984	
P(T<=t) two-tail	0.004405327	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	*Futures Triangle Longboard*
Mean	0.426628654	0.425000809
Variance	0.000162491	0.000167844
Observations	6	5
Hypothesized Mean Difference	0	
df	9	
t Stat	0.209023403	
P(T<=t) two-tail	0.839084346	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Keel	*Futures Neutral*
Mean	0.450134172	0.455412578
Variance	3.56281E-05	2.67607E-05
Observations	4	25
Hypothesized Mean Difference	0	
df	4	
t Stat	-1.671064014	
P(T<=t) two-tail	0.170028673	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Keel	*Futures Performance Longboard*
Mean	0.450134172	0.462025491
Variance	3.56281E-05	4.90136E-05
Observations	4	7
Hypothesized Mean Difference	0	
df	7	
t Stat	-2.98132367	
P(T<=t) two-tail	0.020476425	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Keel	*Futures Pivot*
Mean	0.450134172	0.452191686
Variance	3.56281E-05	8.58278E-05
Observations	4	16
Hypothesized Mean Difference	0	
df	7	
t Stat	-0.544642836	
P(T<=t) two-tail	0.602909382	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Keel	*Futures Pivot Longboard*
Mean	0.450134172	0.457149493
Variance	3.56281E-05	3.95798E-05
Observations	4	3
Hypothesized Mean Difference	0	
df	4	
t Stat	-1.49227368	
P(T<=t) two-tail	0.209907646	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Keel	*Futures Rake*
Mean	0.450134172	0.452524717
Variance	3.56281E-05	1.03183E-05
Observations	4	16
Hypothesized Mean Difference	0	
df	3	
t Stat	-0.773484723	
P(T<=t) two-tail	0.495593255	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Keel	*Futures Triangle Longboard*
Mean	0.450134172	0.425000809
Variance	3.56281E-05	0.000167844
Observations	4	5
Hypothesized Mean Difference	0	
df	6	
t Stat	3.8563761	
P(T<=t) two-tail	0.00839755	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Neutral	*Futures Performance Longboard*
Mean	0.455412578	0.462025491
Variance	2.67607E-05	4.90136E-05
Observations	25	7
Hypothesized Mean Difference	0	
df	8	
t Stat	-2.327514445	
P(T<=t) two-tail	0.048348926	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Neutral	*Futures Pivot*
Mean	0.455412578	0.452191686
Variance	2.67607E-05	8.58278E-05
Observations	25	16
Hypothesized Mean Difference	0	
df	21	
t Stat	1.269735169	
P(T<=t) two-tail	0.218069582	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Neutral	*Futures Pivot Longboard*
Mean	0.455412578	0.457149493
Variance	2.67607E-05	3.95798E-05
Observations	25	3
Hypothesized Mean Difference	0	
df	2	
t Stat	-0.45989879	
P(T<=t) two-tail	0.690744012	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Neutral	*Futures Rake*
Mean	0.455412578	0.452524717
Variance	2.67607E-05	1.03183E-05
Observations	25	16
Hypothesized Mean Difference	0	
df	39	
t Stat	2.204976147	
P(T<=t) two-tail	0.033420191	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Neutral	*Futures Triangle Longboard*
Mean	0.455412578	0.425000809
Variance	2.67607E-05	0.000167844
Observations	25	5
Hypothesized Mean Difference	0	
df	4	
t Stat	5.167223063	
P(T<=t) two-tail	0.006664726	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Performance Longboard	*Futures Pivot*
Mean	0.462025491	0.452191686
Variance	4.90136E-05	8.58278E-05
Observations	7	16
Hypothesized Mean Difference	0	
df	15	
t Stat	2.796429176	
P(T<=t) two-tail	0.013557037	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Performance Longboard	*Futures Pivot Longboard*
Mean	0.462025491	0.457149493
Variance	4.90136E-05	3.95798E-05
Observations	7	3
Hypothesized Mean Difference	0	

df	16
t Stat	1.597984924
P(T<=t) two-tail	0.129604947

df	4
t Stat	1.085023965
P(T<=t) two-tail	0.338930782

t-Test: Two-Sample Assuming Unequal Variances

	Futures Performance Longboard	*Futures Rake*
Mean	0.462025491	0.452524717
Variance	4.90136E-05	1.03183E-05
Observations	7	16
Hypothesized Mean Difference	0	
df	7	
t Stat	3.435723672	
P(T<=t) two-tail	0.010900225	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Performance Longboard	*Futures Triangle Longboard*
Mean	0.462025491	0.425000809
Variance	4.90136E-05	0.000167844
Observations	7	5
Hypothesized Mean Difference	0	
df	6	
t Stat	5.812788878	
P(T<=t) two-tail	0.001138323	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Pivot	*Futures Pivot Longboard*
Mean	0.452191686	0.457149493
Variance	8.58278E-05	3.95798E-05
Observations	16	3
Hypothesized Mean Difference	0	
df	4	
t Stat	-1.150878914	
P(T<=t) two-tail	0.313899138	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Pivot	*Futures Rake*
Mean	0.452191686	0.452524717
Variance	8.58278E-05	1.03183E-05
Observations	16	16
Hypothesized Mean Difference	0	
df	19	
t Stat	-0.135855747	
P(T<=t) two-tail	0.893364386	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Pivot	*Futures Triangle Longboard*
Mean	0.452191686	0.425000809
Variance	8.58278E-05	0.000167844
Observations	16	5
Hypothesized Mean Difference	0	
df	5	
t Stat	4.357764203	
P(T<=t) two-tail	0.007305609	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Pivot Longboard	*Futures Rake*
Mean	0.457149493	0.452524717
Variance	3.95798E-05	1.03183E-05
Observations	3	16
Hypothesized Mean Difference	0	
df	2	
t Stat	1.243229693	
P(T<=t) two-tail	0.339754765	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Pivot Longboard	*Futures Triangle Longboard*
Mean	0.457149493	0.425000809
Variance	3.95798E-05	0.000167844
Observations	3	5
Hypothesized Mean Difference	0	
df	6	
t Stat	4.701278925	
P(T<=t) two-tail	0.003321756	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Rake	*Futures Triangle Longboard*
Mean	0.452524717	0.425000809
Variance	1.03183E-05	0.000167844
Observations	16	5
Hypothesized Mean Difference	0	
df	4	
t Stat	4.705542836	
P(T<=t) two-tail	0.009270239	

Rake Ratio:

= Statistically Significat at alpha = 0.1
= Statistically Significat at alpha = 0.05
= Statistically Significat at alpha = 0.01

Captain Fin

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	*CF Balanced Longboard*
Mean	0.258581471	0.266486288
Variance	0.002460246	0.007247151
Observations	24	6
Hypothesized Mean Difference	0	
df	6	
t Stat	-0.218371041	
P(T<=t) two-tail	0.834377943	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	*CF Drive*
Mean	0.258581471	0.30926522
Variance	0.002460246	0.010488675
Observations	24	6
Hypothesized Mean Difference	0	
df	6	
t Stat	-1.178174943	
P(T<=t) two-tail	0.283333281	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	*CF Drive Longboard*
Mean	0.258581471	0.214583771
Variance	0.002460246	0.003439962
Observations	24	10
Hypothesized Mean Difference	0	
df	15	
t Stat	2.082169699	
P(T<=t) two-tail	0.05486285	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	*CF Keel*
Mean	0.258581471	0.739484881
Variance	0.002460246	0.04132744
Observations	24	5
Hypothesized Mean Difference	0	
df	4	
t Stat	-5.257110029	
P(T<=t) two-tail	0.006266801	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	*CF Pivot*
Mean	0.258581471	0.338928712
Variance	0.002460246	0.01018735
Observations	24	7
Hypothesized Mean Difference	0	
df	7	
t Stat	-2.035676258	
P(T<=t) two-tail	0.081229531	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	*CF Pivot Longboard*
Mean	0.258581471	0.235535053
Variance	0.002460246	0.005149867
Observations	24	12
Hypothesized Mean Difference	0	
df	16	
t Stat	0.999502957	
P(T<=t) two-tail	0.332428258	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	*CF Raked*
Mean	0.258581471	0.2164606
Variance	0.002460246	0.009227077
Observations	24	7
Hypothesized Mean Difference	0	
df	7	
t Stat	1.117510584	
P(T<=t) two-tail	0.300657683	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced Longboard	*CF Drive*
Mean	0.266486288	0.30926522
Variance	0.007247151	0.010488675
Observations	6	6
Hypothesized Mean Difference	0	
df	10	
t Stat	-0.786828074	
P(T<=t) two-tail	0.449627436	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced Longboard	*CF Drive Longboard*
Mean	0.266486288	0.214583771
Variance	0.007247151	0.003439962
Observations	6	10
Hypothesized Mean Difference	0	
df	8	
t Stat	1.317537208	
P(T<=t) two-tail	0.224138517	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced Longboard	*CF Keel*
Mean	0.266486288	0.739484881
Variance	0.007247151	0.04132744
Observations	6	5
Hypothesized Mean Difference	0	
df	5	
t Stat	-4.859685186	
P(T<=t) two-tail	0.004634424	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced Longboard	*CF Pivot*
Mean	0.266486288	0.338928712
Variance	0.007247151	0.01018735
Observations	6	7
Hypothesized Mean Difference	0	
df	11	
t Stat	-1.40375575	
P(T<=t) two-tail	0.187987967	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced Longboard	*CF Pivot Longboard*
Mean	0.266486288	0.235535053
Variance	0.007247151	0.005149867
Observations	6	12
Hypothesized Mean Difference	0	
df	9	
t Stat	0.764982982	
P(T<=t) two-tail	0.46386774	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced Longboard	*CF Raked*
Mean	0.266486288	0.2164606
Variance	0.007247151	0.009227077
Observations	6	7
Hypothesized Mean Difference	0	
df	11	
t Stat	0.995348881	
P(T<=t) two-tail	0.340958035	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive	*CF Drive Longboard*
Mean	0.30926522	0.214583771
Variance	0.010488675	0.003439962

FCS

t-Test: Two-Sample Assuming Unequal Variances

	FCS Accelerator	*FCS Carver*
Mean	0.267581916	0.259660591
Variance	0.00090435	0.000269376
Observations	8	9
Hypothesized Mean Difference	0	
df	11	
t Stat	0.662473789	
P(T<=t) two-tail	0.521306058	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Accelerator	*FCS Keel*
Mean	0.267581916	0.701038067
Variance	0.00090435	0.164137255
Observations	8	9
Hypothesized Mean Difference	0	
df	8	
t Stat	-3.199786663	
P(T<=t) two-tail	0.012616394	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Accelerator	*FCS Neutral Longboard*
Mean	0.267581916	0.261542086
Variance	0.00090435	0.005806058
Observations	8	6
Hypothesized Mean Difference	0	
df	6	
t Stat	0.18372493	
P(T<=t) two-tail	0.860280988	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Accelerator	*FCS Performer*
Mean	0.267581916	0.245106108
Variance	0.00090435	0.000522989
Observations	8	3
Hypothesized Mean Difference	0	
df	5	
t Stat	1.325843064	
P(T<=t) two-tail	0.242232149	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Accelerator	*FCS Reactor*
Mean	0.267581916	0.212793925
Variance	0.00090435	0.001310567
Observations	8	7
Hypothesized Mean Difference	0	
df	12	
t Stat	3.161776649	
P(T<=t) two-tail	0.008193776	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Accelerator	*FCS Twin*
Mean	0.267581916	0.244912429
Variance	0.00090435	0.003004678
Observations	8	8
Hypothesized Mean Difference	0	
df	11	
t Stat	1.025539332	
P(T<=t) two-tail	0.327132911	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Carver	*FCS Keel*
Mean	0.259660591	0.701038067
Variance	0.000269376	0.164137255
Observations	9	9
Hypothesized Mean Difference	0	
df	8	
t Stat	-3.265665933	
P(T<=t) two-tail	0.011430028	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Carver	*FCS Neutral Longboard*
Mean	0.259660591	0.261542086
Variance	0.000269376	0.005806058
Observations	9	6
Hypothesized Mean Difference	0	
df	5	
t Stat	-0.059569421	
P(T<=t) two-tail	0.954806168	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Carver	*FCS Performer*
Mean	0.259660591	0.245106108
Variance	0.000269376	0.000522989
Observations	9	3
Hypothesized Mean Difference	0	
df	3	
t Stat	1.018368133	
P(T<=t) two-tail	0.383476595	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Carver	*FCS Reactor*
Mean	0.259660591	0.212793925
Variance	0.000269376	0.001310567
Observations	9	7
Hypothesized Mean Difference	0	
df	8	
t Stat	3.180384234	
P(T<=t) two-tail	0.012989962	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Carver	*FCS Twin*
Mean	0.259660591	0.244912429
Variance	0.000269376	0.003004678
Observations	9	8
Hypothesized Mean Difference	0	
df	8	
t Stat	0.73237614	
P(T<=t) two-tail	0.484840137	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Keel	*FCS Neutral Longboard*
Mean	0.701038067	0.261542086
Variance	0.164137255	0.005806058
Observations	9	6
Hypothesized Mean Difference	0	
df	9	
t Stat	3.171363804	
P(T<=t) two-tail	0.011341089	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Keel	*FCS Performer*
Mean	0.701038067	0.245106108
Variance	0.164137255	0.000522989
Observations	9	3
Hypothesized Mean Difference	0	
df	8	
t Stat	3.360097527	
P(T<=t) two-tail	0.009930348	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Keel	*FCS Reactor*
Mean	0.701038067	0.212793925
Variance	0.164137255	0.001310567

Futures

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	*Futures Flex Longboard*
Mean	1.250354804	0.356514425
Variance	0.476491956	0.005504967
Observations	3	6
Hypothesized Mean Difference	0	
df	2	
t Stat	2.236361753	
P(T<=t) two-tail	0.154814025	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	*Futures Keel*
Mean	1.250354804	0.967485363
Variance	0.476491956	0.023862386
Observations	3	4
Hypothesized Mean Difference	0	
df	2	
t Stat	0.696806787	
P(T<=t) two-tail	0.558020608	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	*Futures Neutral*
Mean	1.250354804	0.277246996
Variance	0.476491956	0.014760143
Observations	3	25
Hypothesized Mean Difference	0	
df	2	
t Stat	2.437182854	
P(T<=t) two-tail	0.135068559	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	*Futures Performance Longboard*
Mean	1.250354804	0.284190842
Variance	0.476491956	0.003446
Observations	3	7
Hypothesized Mean Difference	0	
df	2	
t Stat	2.420536753	
P(T<=t) two-tail	0.136568105	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	*Futures Pivot*
Mean	1.250354804	0.277158788
Variance	0.476491956	0.017271631
Observations	3	16
Hypothesized Mean Difference	0	
df	2	
t Stat	2.433673625	
P(T<=t) two-tail	0.135382772	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	*Futures Pivot Longboard*
Mean	1.250354804	0.228558818
Variance	0.476491956	0.00194138
Observations	3	3
Hypothesized Mean Difference	0	
df	2	
t Stat	2.558668978	
P(T<=t) two-tail	0.124789207	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	*Futures Rake*
Mean	1.250354804	0.26024125
Variance	0.476491956	0.000266472
Observations	3	16
Hypothesized Mean Difference	0	
df	2	
t Stat	2.484248741	
P(T<=t) two-tail	0.130950721	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	*Futures Triangle Longboard*
Mean	1.250354804	0.188211334
Variance	0.476491956	0.006581753
Observations	3	5
Hypothesized Mean Difference	0	
df	2	
t Stat	2.654139687	
P(T<=t) two-tail	0.117463826	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	*Futures Keel*
Mean	0.356514425	0.967485363
Variance	0.005504967	0.023862386
Observations	6	4
Hypothesized Mean Difference	0	
df	4	
t Stat	-7.364254648	
P(T<=t) two-tail	0.001811547	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	*Futures Neutral*
Mean	0.356514425	0.277246996
Variance	0.005504967	0.014760143
Observations	6	25
Hypothesized Mean Difference	0	
df	12	
t Stat	2.041307725	
P(T<=t) two-tail	0.063843422	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	*Futures Performance Longboard*
Mean	0.356514425	0.284190842
Variance	0.005504967	0.003446
Observations	6	7
Hypothesized Mean Difference	0	
df	10	
t Stat	1.926212655	
P(T<=t) two-tail	0.082952493	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	*Futures Pivot*
Mean	0.356514425	0.277158788
Variance	0.005504967	0.017271631
Observations	6	16
Hypothesized Mean Difference	0	
df	16	
t Stat	1.775791038	
P(T<=t) two-tail	0.094786889	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	*Futures Pivot Longboard*
Mean	0.356514425	0.228558818
Variance	0.005504967	0.00194138
Observations	6	3
Hypothesized Mean Difference	0	
df	6	
t Stat	3.234854487	
P(T<=t) two-tail	0.017801559	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	*Futures Rake*
Mean	0.356514425	0.26024125
Variance	0.005504967	0.000266472

Observations	6	10
Hypothesized Mean Difference	0	
df	7	
t Stat	2.070011583	
P(T<=t) two-tail	0.077215432	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive	CF Keel
Mean	0.30926522	0.739484881
Variance	0.010488675	0.04132744
Observations	6	5
Hypothesized Mean Difference	0	
df	6	
t Stat	-4.29927399	
P(T<=t) two-tail	0.005096842	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive	CF Pivot
Mean	0.30926522	0.338928712
Variance	0.010488675	0.01018735
Observations	6	7
Hypothesized Mean Difference	0	
df	11	
t Stat	-0.524099109	
P(T<=t) two-tail	0.610607182	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive	CF Pivot Longboard
Mean	0.30926522	0.235535053
Variance	0.010488675	0.005149867
Observations	6	12
Hypothesized Mean Difference	0	
df	8	
t Stat	1.580117082	
P(T<=t) two-tail	0.15273488	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive	CF Raked
Mean	0.30926522	0.2164606
Variance	0.010488675	0.009227077
Observations	6	7
Hypothesized Mean Difference	0	
df	10	
t Stat	1.675963895	
P(T<=t) two-tail	0.12468072	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive Longboard	CF Keel
Mean	0.214583771	0.739484881
Variance	0.003439962	0.04132744
Observations	10	5
Hypothesized Mean Difference	0	
df	4	
t Stat	-5.657035778	
P(T<=t) two-tail	0.004812118	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive Longboard	CF Pivot
Mean	0.214583771	0.338928712
Variance	0.003439962	0.01018735
Observations	10	7
Hypothesized Mean Difference	0	
df	9	
t Stat	-2.931382435	
P(T<=t) two-tail	0.016719375	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive Longboard	CF Pivot Longboard
Mean	0.214583771	0.235535053
Variance	0.003439962	0.005149867
Observations	10	12
Hypothesized Mean Difference	0	
df	20	
t Stat	-0.753491305	
P(T<=t) two-tail	0.459933793	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive Longboard	CF Raked
Mean	0.214583771	0.2164606
Variance	0.003439962	0.009227077
Observations	10	7
Hypothesized Mean Difference	0	
df	9	
t Stat	-0.046035157	
P(T<=t) two-tail	0.964287519	

t-Test: Two-Sample Assuming Unequal Variances

	CF Keel	CF Pivot
Mean	0.739484881	0.338928712
Variance	0.04132744	0.01018735
Observations	5	7
Hypothesized Mean Difference	0	
df	5	
t Stat	4.062673216	
P(T<=t) two-tail	0.009703576	

t-Test: Two-Sample Assuming Unequal Variances

	CF Keel	CF Pivot Longboard
Mean	0.739484881	0.235535053
Variance	0.04132744	0.005149867
Observations	5	12
Hypothesized Mean Difference	0	
df	4	
t Stat	5.404573292	
P(T<=t) two-tail	0.005674905	

t-Test: Two-Sample Assuming Unequal Variances

	CF Keel	CF Raked
Mean	0.739484881	0.2164606
Variance	0.04132744	0.009227077
Observations	5	7
Hypothesized Mean Difference	0	
df	5	
t Stat	5.342648025	
P(T<=t) two-tail	0.003082602	

t-Test: Two-Sample Assuming Unequal Variances

	CF Pivot	CF Pivot Longboard
Mean	0.338928712	0.235535053
Variance	0.01018735	0.005149867
Observations	7	12
Hypothesized Mean Difference	0	
df	10	
t Stat	2.381753657	
P(T<=t) two-tail	0.038496964	

t-Test: Two-Sample Assuming Unequal Variances

	CF Pivot	CF Raked
Mean	0.338928712	0.2164606
Variance	0.01018735	0.009227077
Observations	7	7
Hypothesized Mean Difference	0	
df	12	
t Stat	2.325464716	
P(T<=t) two-tail	0.038384935	

t-Test: Two-Sample Assuming Unequal Variances

	CF Pivot Longboard	CF Raked
Mean	0.235535053	0.2164606
Variance	0.005149867	0.009227077
Observations	12	7
Hypothesized Mean Difference	0	

Observations	9	7
Hypothesized Mean Difference	0	
df	8	
t Stat	3.596970433	
P(T<=t) two-tail	0.007013091	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Keel	FCS Twin
Mean	0.701038067	0.244912429
Variance	0.164137255	0.003004678
Observations	9	8
Hypothesized Mean Difference	0	
df	8	
t Stat	3.343302118	
P(T<=t) two-tail	0.01018108	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Neutral Longboard	FCS Performer
Mean	0.261542086	0.245106108
Variance	0.005806058	0.000522989
Observations	6	3
Hypothesized Mean Difference	0	
df	6	
t Stat	0.486363947	
P(T<=t) two-tail	0.643962575	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Neutral Longboard	FCS Reactor
Mean	0.261542086	0.212793925
Variance	0.005806058	0.001310567
Observations	6	7
Hypothesized Mean Difference	0	
df	7	
t Stat	1.43445195	
P(T<=t) two-tail	0.194569511	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Neutral Longboard	FCS Twin
Mean	0.261542086	0.244912429
Variance	0.005806058	0.003004678
Observations	6	8
Hypothesized Mean Difference	0	
df	9	
t Stat	0.453735822	
P(T<=t) two-tail	0.660761953	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Performer	FCS Reactor
Mean	0.245106108	0.212793925
Variance	0.000522989	0.001310567
Observations	3	7
Hypothesized Mean Difference	0	
df	6	
t Stat	1.699339096	
P(T<=t) two-tail	0.140167484	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Performer	FCS Twin
Mean	0.245106108	0.244912429
Variance	0.000522989	0.003004678
Observations	3	8
Hypothesized Mean Difference	0	
df	9	
t Stat	0.008259123	
P(T<=t) two-tail	0.993590425	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Reactor	FCS Twin
Mean	0.212793925	0.244912429
Variance	0.001310567	0.003004678
Observations	7	8
Hypothesized Mean Difference	0	
df	12	
t Stat	-1.353863738	
P(T<=t) two-tail	0.200728982	

Observations	6	16
Hypothesized Mean Difference	0	
df	5	
t Stat	3.149903355	
P(T<=t) two-tail	0.025381708	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	Futures Triangle Longboard
Mean	0.356514425	0.188211334
Variance	0.005504967	0.006581753
Observations	6	5
Hypothesized Mean Difference	0	
df	8	
t Stat	3.56094753	
P(T<=t) two-tail	0.007390506	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Keel	Futures Neutral
Mean	0.967485363	0.277246996
Variance	0.023862386	0.014760143
Observations	4	25
Hypothesized Mean Difference	0	
df	4	
t Stat	8.524708717	
P(T<=t) two-tail	0.001038978	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Keel	Futures Performance Longboard
Mean	0.967485363	0.284190842
Variance	0.023862386	0.003446
Observations	4	7
Hypothesized Mean Difference	0	
df	4	
t Stat	8.502817853	
P(T<=t) two-tail	0.001049247	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Keel	Futures Pivot
Mean	0.967485363	0.277158788
Variance	0.023862386	0.017271631
Observations	4	16
Hypothesized Mean Difference	0	
df	4	
t Stat	8.224544003	
P(T<=t) two-tail	0.001191432	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Keel	Futures Pivot Longboard
Mean	0.967485363	0.228558818
Variance	0.023862386	0.00194138
Observations	4	3
Hypothesized Mean Difference	0	
df	4	
t Stat	9.086802739	
P(T<=t) two-tail	0.000813263	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Keel	Futures Rake
Mean	0.967485363	0.26024125
Variance	0.023862386	0.000266472
Observations	4	16
Hypothesized Mean Difference	0	
df	3	
t Stat	9.144016963	
P(T<=t) two-tail	0.00276484	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Keel	Futures Triangle Longboard
Mean	0.967485363	0.188211334
Variance	0.023862386	0.006581753
Observations	4	5
Hypothesized Mean Difference	0	
df	4	
t Stat	9.132011348	
P(T<=t) two-tail	0.000797886	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Neutral	Futures Performance Longboard
Mean	0.277246996	0.284190842
Variance	0.014760143	0.003446
Observations	25	7
Hypothesized Mean Difference	0	
df	21	
t Stat	-0.211031717	
P(T<=t) two-tail	0.834896918	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Neutral	Futures Pivot
Mean	0.277246996	0.277158788
Variance	0.014760143	0.017271631
Observations	25	16
Hypothesized Mean Difference	0	
df	30	
t Stat	0.002158553	
P(T<=t) two-tail	0.998292015	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Neutral	Futures Pivot Longboard
Mean	0.277246996	0.228558818
Variance	0.014760143	0.00194138
Observations	25	3
Hypothesized Mean Difference	0	
df	7	
t Stat	1.384029245	
P(T<=t) two-tail	0.208868034	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Neutral	Futures Rake
Mean	0.277246996	0.26024125
Variance	0.014760143	0.000266472
Observations	25	16
Hypothesized Mean Difference	0	
df	25	
t Stat	0.690207715	
P(T<=t) two-tail	0.496421781	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Neutral	Futures Triangle Longboard
Mean	0.277246996	0.188211334
Variance	0.014760143	0.006581753
Observations	25	5
Hypothesized Mean Difference	0	
df	8	
t Stat	2.038996125	
P(T<=t) two-tail	0.075791832	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Performance Longboard	Futures Pivot
Mean	0.284190842	0.277158788
Variance	0.003446	0.017271631
Observations	7	16
Hypothesized Mean Difference	0	
df	21	
t Stat	0.177373482	
P(T<=t) two-tail	0.860914729	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Performance Longboard	Futures Pivot Longboard
Mean	0.284190842	0.228558818
Variance	0.003446	0.00194138
Observations	7	3
Hypothesized Mean Difference	0	

df	10	
t Stat	0.456317571	
P(T<=t) two-tail	0.657911732	

df	5	
t Stat	1.648103267	
P(T<=t) two-tail	0.160247086	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Performance Longboard	*Futures Rake*
Mean	0.284190842	0.26024125
Variance	0.003446	0.000266472
Observations	7	16
Hypothesized Mean Difference	0	
df	6	
t Stat	1.06160933	
P(T<=t) two-tail	0.329263926	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Performance Longboard	*Futures Triangle Longboard*
Mean	0.284190842	0.188211334
Variance	0.003446	0.006581753
Observations	7	5
Hypothesized Mean Difference	0	
df	7	
t Stat	2.256851058	
P(T<=t) two-tail	0.058602917	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Pivot	*Futures Pivot Longboard*
Mean	0.277158788	0.228558818
Variance	0.017271631	0.00194138
Observations	16	3
Hypothesized Mean Difference	0	
df	10	
t Stat	1.169606323	
P(T<=t) two-tail	0.26928126	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Pivot	*Futures Rake*
Mean	0.277158788	0.26024125
Variance	0.017271631	0.000266472
Observations	16	16
Hypothesized Mean Difference	0	
df	15	
t Stat	0.510982311	
P(T<=t) two-tail	0.616801536	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Pivot	*Futures Triangle Longboard*
Mean	0.277158788	0.188211334
Variance	0.017271631	0.006581753
Observations	16	5
Hypothesized Mean Difference	0	
df	11	
t Stat	1.817212652	
P(T<=t) two-tail	0.096500363	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Pivot Longboard	*Futures Rake*
Mean	0.228558818	0.26024125
Variance	0.00194138	0.000266472
Observations	3	16
Hypothesized Mean Difference	0	
df	2	
t Stat	-1.229719579	
P(T<=t) two-tail	0.343830809	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Pivot Longboard	*Futures Triangle Longboard*
Mean	0.228558818	0.188211334
Variance	0.00194138	0.006581753
Observations	3	5
Hypothesized Mean Difference	0	
df	6	
t Stat	0.910549439	
P(T<=t) two-tail	0.397636469	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Rake	*Futures Triangle Longboard*
Mean	0.26024125	0.188211334
Variance	0.000266472	0.006581753
Observations	16	5
Hypothesized Mean Difference	0	
df	4	
t Stat	1.972863342	
P(T<=t) two-tail	0.119776086	

Width Ratio:

	= Statistically Significat at alpha = 0.1
	= Statistically Significat at alpha = 0.05
	= Statistically Significat at alpha = 0.01

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t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	CF Balanced Longboard
Mean	0.737941122	0.744682414
Variance	0.000491752	0.001779211
Observations	24	6
Hypothesized Mean Difference	0	
df	6	
t Stat	-0.378613821	
P(T<=t) two-tail	0.718009656	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	CF Drive
Mean	0.737941122	0.759586275
Variance	0.000491752	0.001994119
Observations	24	6
Hypothesized Mean Difference	0	
df	6	
t Stat	-1.15231172	
P(T<=t) two-tail	0.293027861	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	CF Drive Longboard
Mean	0.737941122	0.716515435
Variance	0.000491752	0.001662962
Observations	24	10
Hypothesized Mean Difference	0	
df	11	
t Stat	1.567699195	
P(T<=t) two-tail	0.145249099	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	CF Keel
Mean	0.737941122	0.897904736
Variance	0.000491752	0.003190715
Observations	24	5
Hypothesized Mean Difference	0	
df	4	
t Stat	-6.233035285	
P(T<=t) two-tail	0.003375015	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	CF Pivot
Mean	0.737941122	0.76957042
Variance	0.000491752	0.001518248
Observations	24	7
Hypothesized Mean Difference	0	
df	7	
t Stat	-2.052888591	
P(T<=t) two-tail	0.079192032	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	CF Pivot Longboard
Mean	0.737941122	0.736634461
Variance	0.000491752	0.001205653
Observations	24	12
Hypothesized Mean Difference	0	
df	16	
t Stat	0.118806654	
P(T<=t) two-tail	0.906907389	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	CF Raked
Mean	0.737941122	0.721270228
Variance	0.000491752	0.003427885
Observations	24	7
Hypothesized Mean Difference	0	
df	7	
t Stat	0.738063878	
P(T<=t) two-tail	0.484478254	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced Longboard	CF Drive
Mean	0.744682414	0.759586275
Variance	0.001779211	0.001994119
Observations	6	6
Hypothesized Mean Difference	0	
df	10	
t Stat	-0.59430855	
P(T<=t) two-tail	0.565508017	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced Longboard	CF Drive Longboard
Mean	0.744682414	0.716515435
Variance	0.001779211	0.001662962
Observations	6	10
Hypothesized Mean Difference	0	
df	10	
t Stat	1.309268905	
P(T<=t) two-tail	0.219727135	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced Longboard	CF Keel
Mean	0.744682414	0.897904736
Variance	0.001779211	0.003190715
Observations	6	5
Hypothesized Mean Difference	0	
df	7	
t Stat	-5.011768323	
P(T<=t) two-tail	0.001544681	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced Longboard	CF Pivot
Mean	0.744682414	0.76957042
Variance	0.001779211	0.001518248
Observations	6	7
Hypothesized Mean Difference	0	
df	10	
t Stat	-1.098374352	
P(T<=t) two-tail	0.297782403	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced Longboard	CF Pivot Longboard
Mean	0.744682414	0.736634461
Variance	0.001779211	0.001205653
Observations	6	12
Hypothesized Mean Difference	0	
df	9	
t Stat	0.403911994	
P(T<=t) two-tail	0.69570654	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced Longboard	CF Raked
Mean	0.744682414	0.721270228
Variance	0.001779211	0.003427885
Observations	6	7
Hypothesized Mean Difference	0	
df	11	
t Stat	0.834961203	
P(T<=t) two-tail	0.421503952	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive	CF Drive Longboard
Mean	0.759586275	0.716515435
Variance	0.001994119	0.001662962

FCS

t-Test: Two-Sample Assuming Unequal Variances

	FCS Accelerator	FCS Carver
Mean	0.74400761	0.739093882
Variance	0.00013467	5.59229E-05
Observations	8	9
Hypothesized Mean Difference	0	
df	12	
t Stat	1.023527795	
P(T<=t) two-tail	0.326249708	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Accelerator	FCS Keel
Mean	0.74400761	0.87570969
Variance	0.00013467	0.01705574
Observations	8	9
Hypothesized Mean Difference	0	
df	8	
t Stat	-3.0120222	
P(T<=t) two-tail	0.01676184	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Accelerator	FCS Neutral Longboard
Mean	0.74400761	0.753557502
Variance	0.00013467	0.001773842
Observations	8	6
Hypothesized Mean Difference	0	
df	6	
t Stat	-0.540245932	
P(T<=t) two-tail	0.608480687	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Accelerator	FCS Performer
Mean	0.74400761	0.732433655
Variance	0.00013467	0.000115422
Observations	8	3
Hypothesized Mean Difference	0	
df	4	
t Stat	1.556283783	
P(T<=t) two-tail	0.194625974	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Accelerator	FCS Reactor
Mean	0.74400761	0.716015717
Variance	0.00013467	0.000506226
Observations	8	7
Hypothesized Mean Difference	0	
df	9	
t Stat	2.96460745	
P(T<=t) two-tail	0.015840531	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Accelerator	FCS Twin
Mean	0.74400761	0.731072244
Variance	0.00013467	0.000681521
Observations	8	8
Hypothesized Mean Difference	0	
df	10	
t Stat	1.280641613	
P(T<=t) two-tail	0.229224202	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Carver	FCS Keel
Mean	0.739093882	0.87570969
Variance	5.59229E-05	0.017055744
Observations	9	9
Hypothesized Mean Difference	0	
df	8	
t Stat	-3.133112915	
P(T<=t) two-tail	0.013949539	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Carver	FCS Neutral Longboard
Mean	0.739093882	0.753557502
Variance	5.59229E-05	0.001773842
Observations	9	6
Hypothesized Mean Difference	0	
df	5	
t Stat	-0.8324892	
P(T<=t) two-tail	0.443065879	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Carver	FCS Performer
Mean	0.739093882	0.732433655
Variance	5.59229E-05	0.000115422
Observations	9	3
Hypothesized Mean Difference	0	
df	3	
t Stat	0.996312257	
P(T<=t) two-tail	0.392529902	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Carver	FCS Reactor
Mean	0.739093882	0.716015717
Variance	5.59229E-05	0.000506226
Observations	9	7
Hypothesized Mean Difference	0	
df	7	
t Stat	2.60422718	
P(T<=t) two-tail	0.035207862	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Carver	FCS Twin
Mean	0.739093882	0.731072244
Variance	5.59229E-05	0.000681521
Observations	9	8
Hypothesized Mean Difference	0	
df	8	
t Stat	0.839036518	
P(T<=t) two-tail	0.425808175	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Keel	FCS Neutral Longboard
Mean	0.87570969	0.753557502
Variance	0.017055744	0.001773842
Observations	9	6
Hypothesized Mean Difference	0	
df	10	
t Stat	2.609801761	
P(T<=t) two-tail	0.026049653	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Keel	FCS Performer
Mean	0.87570969	0.732433655
Variance	0.017055744	0.000115422
Observations	9	3
Hypothesized Mean Difference	0	
df	8	
t Stat	3.258330276	
P(T<=t) two-tail	0.011556117	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Keel	FCS Reactor
Mean	0.87570969	0.716015717
Variance	0.017055744	0.000506226

Futures

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	Futures Flex Longboard
Mean	1.133676462	0.81519228
Variance	0.074366369	0.000752434
Observations	3	6
Hypothesized Mean Difference	0	
df	2	
t Stat	2.017736431	
P(T<=t) two-tail	0.181111054	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	Futures Keel
Mean	1.133676462	0.992401014
Variance	0.074366369	0.008932979
Observations	3	4
Hypothesized Mean Difference	0	
df	2	
t Stat	0.859424385	
P(T<=t) two-tail	0.480671023	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	Futures Neutral
Mean	1.133676462	0.743302135
Variance	0.074366369	0.001957291
Observations	3	25
Hypothesized Mean Difference	0	
df	2	
t Stat	2.475533697	
P(T<=t) two-tail	0.131699883	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	Futures Performance Longboard
Mean	1.133676462	0.755093871
Variance	0.074366369	0.001070132
Observations	3	7
Hypothesized Mean Difference	0	
df	2	
t Stat	2.397164916	
P(T<=t) two-tail	0.138712858	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	Futures Pivot
Mean	1.133676462	0.740649447
Variance	0.074366369	0.002977473
Observations	3	16
Hypothesized Mean Difference	0	
df	2	
t Stat	2.486970786	
P(T<=t) two-tail	0.130717947	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	Futures Pivot Longboard
Mean	1.133676462	0.726121697
Variance	0.074366369	0.000281102
Observations	3	3
Hypothesized Mean Difference	0	
df	2	
t Stat	2.583681962	
P(T<=t) two-tail	0.122809364	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	Futures Rake
Mean	1.133676462	0.741550271
Variance	0.074366369	3.98558E-05
Observations	3	16
Hypothesized Mean Difference	0	
df	2	
t Stat	2.490441648	
P(T<=t) two-tail	0.130421975	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	Futures Triangle Longboard
Mean	1.133676462	0.707542383
Variance	0.074366369	0.002002538
Observations	3	5
Hypothesized Mean Difference	0	
df	2	
t Stat	2.684962611	
P(T<=t) two-tail	0.115227869	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	Futures Keel
Mean	0.81519228	0.992401014
Variance	0.000752434	0.008932979
Observations	6	4
Hypothesized Mean Difference	0	
df	3	
t Stat	-3.648827536	
P(T<=t) two-tail	0.035521452	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	Futures Neutral
Mean	0.81519228	0.743302135
Variance	0.000752434	0.001957291
Observations	6	25
Hypothesized Mean Difference	0	
df	12	
t Stat	5.037054876	
P(T<=t) two-tail	0.00029073	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	Futures Performance Longboard
Mean	0.81519228	0.755093871
Variance	0.000752434	0.001070132
Observations	6	7
Hypothesized Mean Difference	0	
df	11	
t Stat	3.60263801	
P(T<=t) two-tail	0.004150707	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	Futures Pivot
Mean	0.81519228	0.740649447
Variance	0.000752434	0.002977473
Observations	6	16
Hypothesized Mean Difference	0	
df	18	
t Stat	4.22355764	
P(T<=t) two-tail	0.000510783	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	Futures Pivot Longboard
Mean	0.81519228	0.726121697
Variance	0.000752434	0.000281102
Observations	6	3
Hypothesized Mean Difference	0	
df	6	
t Stat	6.017370984	
P(T<=t) two-tail	0.000950009	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	Futures Rake
Mean	0.81519228	0.741550271
Variance	0.000752434	3.98558E-05

Observations	6	10
Hypothesized Mean Difference	0	
df	10	
t Stat	1.928793265	
P(T<=t) two-tail	0.082599148	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive	*CF Keel*
Mean	0.759586275	0.897904736
Variance	0.001994119	0.003190715
Observations	6	5
Hypothesized Mean Difference	0	
df	8	
t Stat	-4.440002734	
P(T<=t) two-tail	0.002167938	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive	*CF Pivot*
Mean	0.759586275	0.76957042
Variance	0.001994119	0.001518248
Observations	6	7
Hypothesized Mean Difference	0	
df	10	
t Stat	-0.426017555	
P(T<=t) two-tail	0.67911912	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive	*CF Pivot Longboard*
Mean	0.759586275	0.736634461
Variance	0.001994119	0.001205653
Observations	6	12
Hypothesized Mean Difference	0	
df	8	
t Stat	1.103217675	
P(T<=t) two-tail	0.302009708	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive	*CF Raked*
Mean	0.759586275	0.721270228
Variance	0.001994119	0.003427885
Observations	6	7
Hypothesized Mean Difference	0	
df	11	
t Stat	1.33638404	
P(T<=t) two-tail	0.208409569	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive Longboard	*CF Keel*
Mean	0.716515435	0.897904736
Variance	0.001662962	0.003190715
Observations	10	5
Hypothesized Mean Difference	0	
df	6	
t Stat	-6.395360895	
P(T<=t) two-tail	0.00068832	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive Longboard	*CF Pivot*
Mean	0.716515435	0.76957042
Variance	0.001662962	0.001518248
Observations	10	7
Hypothesized Mean Difference	0	
df	13	
t Stat	-2.71031494	
P(T<=t) two-tail	0.017839541	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive Longboard	*CF Pivot Longboard*
Mean	0.716515435	0.736634461
Variance	0.001662962	0.001205653
Observations	10	12
Hypothesized Mean Difference	0	
df	18	
t Stat	-1.231801377	
P(T<=t) two-tail	0.233873621	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive Longboard	*CF Raked*
Mean	0.716515435	0.721270228
Variance	0.001662962	0.003427885
Observations	10	7
Hypothesized Mean Difference	0	
df	10	
t Stat	-0.185644338	
P(T<=t) two-tail	0.85643519	

t-Test: Two-Sample Assuming Unequal Variances

	CF Keel	*CF Pivot*
Mean	0.897904736	0.76957042
Variance	0.003190715	0.001518248
Observations	5	7
Hypothesized Mean Difference	0	
df	7	
t Stat	4.388849649	
P(T<=t) two-tail	0.003199868	

t-Test: Two-Sample Assuming Unequal Variances

	CF Keel	*CF Pivot Longboard*
Mean	0.897904736	0.736634461
Variance	0.003190715	0.001205653
Observations	5	12
Hypothesized Mean Difference	0	
df	5	
t Stat	5.933972818	
P(T<=t) two-tail	0.00193975	

t-Test: Two-Sample Assuming Unequal Variances

	CF Keel	*CF Raked*
Mean	0.897904736	0.721270228
Variance	0.003190715	0.003427885
Observations	5	7
Hypothesized Mean Difference	0	
df	9	
t Stat	5.259586924	
P(T<=t) two-tail	0.00052102	

t-Test: Two-Sample Assuming Unequal Variances

	CF Pivot	*CF Pivot Longboard*
Mean	0.76957042	0.736634461
Variance	0.001518248	0.001205653
Observations	7	12
Hypothesized Mean Difference	0	
df	12	
t Stat	1.848807481	
P(T<=t) two-tail	0.089262853	

t-Test: Two-Sample Assuming Unequal Variances

	CF Pivot	*CF Raked*
Mean	0.76957042	0.721270228
Variance	0.001518248	0.003427885
Observations	7	7
Hypothesized Mean Difference	0	
df	10	
t Stat	1.817041896	
P(T<=t) two-tail	0.099255173	

t-Test: Two-Sample Assuming Unequal Variances

	CF Pivot Longboard	*CF Raked*
Mean	0.736634461	0.721270228
Variance	0.001205653	0.003427885
Observations	12	7
Hypothesized Mean Difference	0	

Observations	9	7
Hypothesized Mean Difference	0	
df	9	
t Stat	3.60032837	
P(T<=t) two-tail	0.005745365	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Keel	*FCS Twin*
Mean	0.87570969	0.731072244
Variance	0.017055744	0.000681521
Observations	9	8
Hypothesized Mean Difference	0	
df	9	
t Stat	3.250260912	
P(T<=t) two-tail	0.009993197	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Neutral Longboard	*FCS Performer*
Mean	0.753557502	0.732433655
Variance	0.001773842	0.000115422
Observations	6	3
Hypothesized Mean Difference	0	
df	6	
t Stat	1.155647941	
P(T<=t) two-tail	0.291761668	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Neutral Longboard	*FCS Reactor*
Mean	0.753557502	0.716015717
Variance	0.001773842	0.000506226
Observations	6	7
Hypothesized Mean Difference	0	
df	7	
t Stat	1.957111806	
P(T<=t) two-tail	0.091206983	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Neutral Longboard	*FCS Twin*
Mean	0.753557502	0.731072244
Variance	0.001773842	0.000681521
Observations	6	8
Hypothesized Mean Difference	0	
df	8	
t Stat	1.152211112	
P(T<=t) two-tail	0.282500402	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Performer	*FCS Reactor*
Mean	0.732433655	0.716015717
Variance	0.000115422	0.000506226
Observations	3	7
Hypothesized Mean Difference	0	
df	8	
t Stat	1.559784016	
P(T<=t) two-tail	0.157431033	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Performer	*FCS Twin*
Mean	0.732433655	0.731072244
Variance	0.000115422	0.000681521
Observations	3	8
Hypothesized Mean Difference	0	
df	9	
t Stat	0.122424204	
P(T<=t) two-tail	0.905253182	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Reactor	*FCS Twin*
Mean	0.716015717	0.731072244
Variance	0.000506226	0.000681521
Observations	7	8
Hypothesized Mean Difference	0	
df	13	
t Stat	-1.199701613	
P(T<=t) two-tail	0.251663767	

Observations	6	16
Hypothesized Mean Difference	0	
df	5	
t Stat	6.511724069	
P(T<=t) two-tail	0.001276157	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	*Futures Triangle Longboard*
Mean	0.81519228	0.707542383
Variance	0.000752434	0.002002538
Observations	6	5
Hypothesized Mean Difference	0	
df	6	
t Stat	4.694145683	
P(T<=t) two-tail	0.003346415	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Keel	*Futures Neutral*
Mean	0.992401014	0.743302135
Variance	0.008932979	0.001957291
Observations	4	25
Hypothesized Mean Difference	0	
df	3	
t Stat	5.181093268	
P(T<=t) two-tail	0.013958114	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Keel	*Futures Performance Longboard*
Mean	0.992401014	0.755093871
Variance	0.008932979	0.001070132
Observations	4	7
Hypothesized Mean Difference	0	
df	3	
t Stat	4.858079339	
P(T<=t) two-tail	0.016653364	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Keel	*Futures Pivot*
Mean	0.992401014	0.740649447
Variance	0.008932979	0.002977473
Observations	4	16
Hypothesized Mean Difference	0	
df	4	
t Stat	5.118279749	
P(T<=t) two-tail	0.006894366	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Keel	*Futures Pivot Longboard*
Mean	0.992401014	0.726121697
Variance	0.008932979	0.000281102
Observations	4	3
Hypothesized Mean Difference	0	
df	3	
t Stat	5.520066871	
P(T<=t) two-tail	0.0117103	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Keel	*Futures Rake*
Mean	0.992401014	0.741550271
Variance	0.008932979	3.98558E-05
Observations	4	16
Hypothesized Mean Difference	0	
df	3	
t Stat	5.305241544	
P(T<=t) two-tail	0.013074309	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Keel	*Futures Triangle Longboard*
Mean	0.992401014	0.707542383
Variance	0.008932979	0.002002538
Observations	4	5
Hypothesized Mean Difference	0	
df	4	
t Stat	5.55062545	
P(T<=t) two-tail	0.005154687	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Neutral	*Futures Performance Longboard*
Mean	0.743302135	0.755093871
Variance	0.001957291	0.001070132
Observations	25	7
Hypothesized Mean Difference	0	
df	13	
t Stat	-0.775557859	
P(T<=t) two-tail	0.451888557	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Neutral	*Futures Pivot*
Mean	0.743302135	0.740649447
Variance	0.001957291	0.002977473
Observations	25	16
Hypothesized Mean Difference	0	
df	27	
t Stat	0.163143135	
P(T<=t) two-tail	0.871620719	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Neutral	*Futures Pivot Longboard*
Mean	0.743302135	0.726121697
Variance	0.001957291	0.000281102
Observations	25	3
Hypothesized Mean Difference	0	
df	6	
t Stat	1.310025278	
P(T<=t) two-tail	0.23810457	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Neutral	*Futures Rake*
Mean	0.743302135	0.741550271
Variance	0.001957291	3.98558E-05
Observations	25	16
Hypothesized Mean Difference	0	
df	26	
t Stat	0.194913208	
P(T<=t) two-tail	0.846976005	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Neutral	*Futures Triangle Longboard*
Mean	0.743302135	0.707542383
Variance	0.001957291	0.002002538
Observations	25	5
Hypothesized Mean Difference	0	
df	6	
t Stat	1.634247333	
P(T<=t) two-tail	0.153325031	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Performance Longboard	*Futures Pivot*
Mean	0.755093871	0.740649447
Variance	0.001070132	0.002977473
Observations	7	16
Hypothesized Mean Difference	0	
df	19	
t Stat	0.784550343	
P(T<=t) two-tail	0.442389851	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Performance Longboard	*Futures Pivot Longboard*
Mean	0.755093871	0.726121697
Variance	0.001070132	0.000281102
Observations	7	3
Hypothesized Mean Difference	0	

df	9
t Stat	0.632444907
P(T<=t) two-tail	0.542827592

df	7
t Stat	1.845036861
P(T<=t) two-tail	0.107547414

t-Test: Two-Sample Assuming Unequal Variances

	Futures Performance Longboard	*Futures Rake*
Mean	0.755093871	0.741550271
Variance	0.001070132	3.98558E-05
Observations	7	16
Hypothesized Mean Difference	0	
df	6	
t Stat	1.086562454	
P(T<=t) two-tail	0.318942593	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Performance Longboard	*Futures Triangle Longboard*
Mean	0.755093871	0.707542383
Variance	0.001070132	0.002002538
Observations	7	5
Hypothesized Mean Difference	0	
df	7	
t Stat	2.021394006	
P(T<=t) two-tail	0.082959532	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Pivot	*Futures Pivot Longboard*
Mean	0.740649447	0.726121697
Variance	0.002977473	0.000281102
Observations	16	3
Hypothesized Mean Difference	0	
df	12	
t Stat	0.868520561	
P(T<=t) two-tail	0.402145893	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Pivot	*Futures Rake*
Mean	0.740649447	0.741550271
Variance	0.002977473	3.98558E-05
Observations	16	16
Hypothesized Mean Difference	0	
df	15	
t Stat	-0.065597726	
P(T<=t) two-tail	0.948564397	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Pivot	*Futures Triangle Longboard*
Mean	0.740649447	0.707542383
Variance	0.002977473	0.002002538
Observations	16	5
Hypothesized Mean Difference	0	
df	8	
t Stat	1.366941006	
P(T<=t) two-tail	0.208818042	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Pivot Longboard	*Futures Rake*
Mean	0.726121697	0.741550271
Variance	0.000281102	3.98558E-05
Observations	3	16
Hypothesized Mean Difference	0	
df	2	
t Stat	-1.573102609	
P(T<=t) two-tail	0.256334854	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Pivot Longboard	*Futures Triangle Longboard*
Mean	0.726121697	0.707542383
Variance	0.000281102	0.002002538
Observations	3	5
Hypothesized Mean Difference	0	
df	5	
t Stat	0.835746746	
P(T<=t) two-tail	0.441392821	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Rake	*Futures Triangle Longboard*
Mean	0.741550271	0.707542383
Variance	3.98558E-05	0.002002538
Observations	16	5
Hypothesized Mean Difference	0	
df	4	
t Stat	1.694056634	
P(T<=t) two-tail	0.165503858	

Angle:

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t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	CF Balanced Longboard
Mean	31.87114328	38.69553183
Variance	1.252883452	10.4359061
Observations	24	6
Hypothesized Mean Difference	0	
df	5	
t Stat	-5.098621518	
P(T<=t) two-tail	0.003774549	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	CF Drive
Mean	31.87114328	32.44131925
Variance	1.252883452	1.165520204
Observations	24	6
Hypothesized Mean Difference	0	
df	8	
t Stat	-1.148519743	
P(T<=t) two-tail	0.283933988	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	CF Drive Longboard
Mean	31.87114328	42.06385787
Variance	1.252883452	6.425335718
Observations	24	10
Hypothesized Mean Difference	0	
df	10	
t Stat	-12.2286815	
P(T<=t) two-tail	2.44572E-07	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	CF Keel
Mean	31.87114328	27.4570562
Variance	1.252883452	2.098089276
Observations	24	5
Hypothesized Mean Difference	0	
df	5	
t Stat	6.426168521	
P(T<=t) two-tail	0.001355147	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	CF Pivot
Mean	31.87114328	32.22540767
Variance	1.252883452	3.115222575
Observations	24	7
Hypothesized Mean Difference	0	
df	7	
t Stat	-0.502396421	
P(T<=t) two-tail	0.63080464	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	CF Pivot Longboard
Mean	31.87114328	38.39107216
Variance	1.252883452	3.150118377
Observations	24	12
Hypothesized Mean Difference	0	
df	16	
t Stat	-11.62211802	
P(T<=t) two-tail	3.26618E-09	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced	CF Raked
Mean	31.87114328	37.84847823
Variance	1.252883452	8.718465242
Observations	24	7
Hypothesized Mean Difference	0	
df	7	
t Stat	-5.24711629	
P(T<=t) two-tail	0.001189963	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced Longboard	CF Drive
Mean	38.69553183	32.44131925
Variance	10.4359061	1.165520204
Observations	6	6
Hypothesized Mean Difference	0	
df	6	
t Stat	4.497721615	
P(T<=t) two-tail	0.004113904	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced Longboard	CF Drive Longboard
Mean	38.69553183	42.06385787
Variance	10.4359061	6.425335718
Observations	6	10
Hypothesized Mean Difference	0	
df	9	
t Stat	-2.182512827	
P(T<=t) two-tail	0.056940859	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced Longboard	CF Keel
Mean	38.69553183	27.4570562
Variance	10.4359061	2.098089276
Observations	6	5
Hypothesized Mean Difference	0	
df	7	
t Stat	7.648699002	
P(T<=t) two-tail	0.000121278	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced Longboard	CF Pivot
Mean	38.69553183	32.22540767
Variance	10.4359061	3.115222575
Observations	6	7
Hypothesized Mean Difference	0	
df	7	
t Stat	4.377756009	
P(T<=t) two-tail	0.003243305	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced Longboard	CF Pivot Longboard
Mean	38.69553183	38.39107216
Variance	10.4359061	3.150118377
Observations	6	12
Hypothesized Mean Difference	0	
df	7	
t Stat	0.215187202	
P(T<=t) two-tail	0.835756576	

t-Test: Two-Sample Assuming Unequal Variances

	CF Balanced Longboard	CF Raked
Mean	38.69553183	37.84847823
Variance	10.4359061	8.718465242
Observations	6	7
Hypothesized Mean Difference	0	
df	10	
t Stat	0.490289226	
P(T<=t) two-tail	0.634508123	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive	CF Drive Longboard
Mean	32.44131925	42.06385787
Variance	1.165520204	6.425335718

FCS

t-Test: Two-Sample Assuming Unequal Variances

	FCS Accelerator	FCS Carver
Mean	31.7628983	31.46333558
Variance	0.56822082	0.205028155
Observations	8	9
Hypothesized Mean Difference	0	
df	11	
t Stat	0.978062584	
P(T<=t) two-tail	0.349063839	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Accelerator	FCS Keel
Mean	31.7628983	26.61696167
Variance	0.56822082	5.162771043
Observations	8	9
Hypothesized Mean Difference	0	
df	10	
t Stat	6.409085983	
P(T<=t) two-tail	7.74192E-05	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Accelerator	FCS Neutral Longboard
Mean	31.7628983	37.598155
Variance	0.56822082	8.144196622
Observations	8	6
Hypothesized Mean Difference	0	
df	6	
t Stat	-4.882429737	
P(T<=t) two-tail	0.002759437	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Accelerator	FCS Performer
Mean	31.7628983	32.23408602
Variance	0.56822082	1.023574394
Observations	8	3
Hypothesized Mean Difference	0	
df	3	
t Stat	-0.733888237	
P(T<=t) two-tail	0.516170488	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Accelerator	FCS Reactor
Mean	31.7628983	32.77820856
Variance	0.56822082	0.549831398
Observations	8	7
Hypothesized Mean Difference	0	
df	13	
t Stat	-2.625242039	
P(T<=t) two-tail	0.020976197	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Accelerator	FCS Twin
Mean	31.7628983	33.18522456
Variance	0.56822082	2.806578162
Observations	8	8
Hypothesized Mean Difference	0	
df	10	
t Stat	-2.189879749	
P(T<=t) two-tail	0.053346785	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Carver	FCS Keel
Mean	31.46333558	26.61696167
Variance	0.205028155	5.162771043
Observations	9	9
Hypothesized Mean Difference	0	
df	9	
t Stat	6.275380194	
P(T<=t) two-tail	0.000145173	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Carver	FCS Neutral Longboard
Mean	31.46333558	37.598155
Variance	0.205028155	8.144196622
Observations	9	6
Hypothesized Mean Difference	0	
df	5	
t Stat	-5.222026954	
P(T<=t) two-tail	0.003404164	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Carver	FCS Performer
Mean	31.46333558	32.23408602
Variance	0.205028155	1.023574394
Observations	9	3
Hypothesized Mean Difference	0	
df	2	
t Stat	-1.2775549	
P(T<=t) two-tail	0.329655745	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Carver	FCS Reactor
Mean	31.46333558	32.77820856
Variance	0.205028155	0.549831398
Observations	9	7
Hypothesized Mean Difference	0	
df	9	
t Stat	-4.130651282	
P(T<=t) two-tail	0.002557005	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Carver	FCS Twin
Mean	31.46333558	33.18522456
Variance	0.205028155	2.806578162
Observations	9	8
Hypothesized Mean Difference	0	
df	8	
t Stat	-2.817084448	
P(T<=t) two-tail	0.022595113	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Keel	FCS Neutral Longboard
Mean	26.61696167	37.598155
Variance	5.162771043	8.144196622
Observations	9	6
Hypothesized Mean Difference	0	
df	9	
t Stat	-7.902373939	
P(T<=t) two-tail	2.44129E-05	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Keel	FCS Performer
Mean	26.61696167	32.23408602
Variance	5.162771043	1.023574394
Observations	9	3
Hypothesized Mean Difference	0	
df	8	
t Stat	-5.872772815	
P(T<=t) two-tail	0.000373036	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Keel	FCS Reactor
Mean	26.61696167	32.77820856
Variance	5.162771043	0.549831398

Futures

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	Futures Flex Longboard
Mean	40.97186585	38.06939902
Variance	2.647740565	14.15762834
Observations	3	5
Hypothesized Mean Difference	0	
df	6	
t Stat	1.506052548	
P(T<=t) two-tail	0.182766716	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	Futures Keel
Mean	40.97186585	25.23974669
Variance	2.647740565	4.173271522
Observations	3	4
Hypothesized Mean Difference	0	
df	5	
t Stat	11.33628036	
P(T<=t) two-tail	9.34131E-05	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	Futures Neutral
Mean	40.97186585	32.63494775
Variance	2.647740565	1.038044079
Observations	3	25
Hypothesized Mean Difference	0	
df	2	
t Stat	8.672525615	
P(T<=t) two-tail	0.013036209	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	Futures Performance Longboard
Mean	40.97186585	38.91110511
Variance	2.647740565	11.47121793
Observations	3	7
Hypothesized Mean Difference	0	
df	8	
t Stat	1.297815942	
P(T<=t) two-tail	0.230517608	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	Futures Pivot
Mean	40.97186585	33.45346394
Variance	2.647740565	4.240808798
Observations	3	16
Hypothesized Mean Difference	0	
df	3	
t Stat	7.018179182	
P(T<=t) two-tail	0.005941993	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	Futures Pivot Longboard
Mean	40.97186585	39.31767148
Variance	2.647740565	8.581664482
Observations	3	3
Hypothesized Mean Difference	0	
df	3	
t Stat	0.855005269	
P(T<=t) two-tail	0.45539588	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	Futures Rake
Mean	40.97186585	31.63623681
Variance	2.647740565	0.259009958
Observations	3	16
Hypothesized Mean Difference	0	
df	2	
t Stat	9.847357619	
P(T<=t) two-tail	0.010155594	

t-Test: Two-Sample Assuming Unequal Variances

	Futures cutaway hatchet	Futures Triangle Longboard
Mean	40.97186585	38.57637631
Variance	2.647740565	2.989032959
Observations	3	5
Hypothesized Mean Difference	0	
df	5	
t Stat	1.968823023	
P(T<=t) two-tail	0.106083603	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	Futures Keel
Mean	38.06939902	25.23974669
Variance	14.15762834	4.173271522
Observations	5	4
Hypothesized Mean Difference	0	
df	6	
t Stat	6.517601476	
P(T<=t) two-tail	0.000622164	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	Futures Neutral
Mean	38.06939902	32.63494775
Variance	14.15762834	1.038044079
Observations	5	25
Hypothesized Mean Difference	0	
df	4	
t Stat	3.206153429	
P(T<=t) two-tail	0.032708478	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	Futures Performance Longboard
Mean	38.06939902	38.91110511
Variance	14.15762834	11.47121793
Observations	5	7
Hypothesized Mean Difference	0	
df	8	
t Stat	-0.398101244	
P(T<=t) two-tail	0.700968362	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	Futures Pivot
Mean	38.06939902	33.45346394
Variance	14.15762834	4.240808798
Observations	5	16
Hypothesized Mean Difference	0	
df	5	
t Stat	2.623123909	
P(T<=t) two-tail	0.046920614	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	Futures Pivot Longboard
Mean	38.06939902	39.31767148
Variance	14.15762834	8.581664482
Observations	5	3
Hypothesized Mean Difference	0	
df	5	
t Stat	-0.523207391	
P(T<=t) two-tail	0.623180474	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	Futures Rake
Mean	38.06939902	31.63623681
Variance	14.15762834	0.259009958

Observations	6	10
Hypothesized Mean Difference	0	
df	13	
t Stat	-10.51918799	
P(T<=t) two-tail	9.96997E-08	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive	*CF Keel*
Mean	32.44131925	27.4570562
Variance	1.165520204	2.098089276
Observations	6	5
Hypothesized Mean Difference	0	
df	7	
t Stat	6.361540802	
P(T<=t) two-tail	0.000381001	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive	*CF Pivot*
Mean	32.44131925	32.22540767
Variance	1.165520204	3.115222575
Observations	6	7
Hypothesized Mean Difference	0	
df	10	
t Stat	0.270040319	
P(T<=t) two-tail	0.792620152	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive	*CF Pivot Longboard*
Mean	32.44131925	38.39107216
Variance	1.165520204	3.150118377
Observations	6	12
Hypothesized Mean Difference	0	
df	15	
t Stat	-8.80345932	
P(T<=t) two-tail	2.59923E-07	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive	*CF Raked*
Mean	32.44131925	37.84847823
Variance	1.165520204	8.718465242
Observations	6	7
Hypothesized Mean Difference	0	
df	8	
t Stat	-4.506359512	
P(T<=t) two-tail	0.001985336	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive Longboard	*CF Keel*
Mean	42.06385787	27.4570562
Variance	6.425335718	2.098089276
Observations	10	5
Hypothesized Mean Difference	0	
df	13	
t Stat	14.17300414	
P(T<=t) two-tail	2.77325E-09	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive Longboard	*CF Pivot*
Mean	42.06385787	32.22540767
Variance	6.425335718	3.115222575
Observations	10	7
Hypothesized Mean Difference	0	
df	15	
t Stat	9.434068097	
P(T<=t) two-tail	1.06942E-07	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive Longboard	*CF Pivot Longboard*
Mean	42.06385787	38.39107216
Variance	6.425335718	3.150118377
Observations	10	12
Hypothesized Mean Difference	0	
df	16	
t Stat	3.860653977	
P(T<=t) two-tail	0.00138389	

t-Test: Two-Sample Assuming Unequal Variances

	CF Drive Longboard	*CF Raked*
Mean	42.06385787	37.84847823
Variance	6.425335718	8.718465242
Observations	10	7
Hypothesized Mean Difference	0	
df	12	
t Stat	3.067837903	
P(T<=t) two-tail	0.009755914	

t-Test: Two-Sample Assuming Unequal Variances

	CF Keel	*CF Pivot*
Mean	27.4570562	32.22540767
Variance	2.098089276	3.115222575
Observations	5	7
Hypothesized Mean Difference	0	
df	10	
t Stat	-5.128001861	
P(T<=t) two-tail	0.000445469	

t-Test: Two-Sample Assuming Unequal Variances

	CF Keel	*CF Pivot Longboard*
Mean	27.4570562	38.39107216
Variance	2.098089276	3.150118377
Observations	5	12
Hypothesized Mean Difference	0	
df	9	
t Stat	-13.23874614	
P(T<=t) two-tail	3.32085E-07	

t-Test: Two-Sample Assuming Unequal Variances

	CF Keel	*CF Raked*
Mean	27.4570562	37.84847823
Variance	2.098089276	8.718465242
Observations	5	7
Hypothesized Mean Difference	0	
df	9	
t Stat	-8.052915497	
P(T<=t) two-tail	2.09983E-05	

t-Test: Two-Sample Assuming Unequal Variances

	CF Pivot	*CF Pivot Longboard*
Mean	32.22540767	38.39107216
Variance	3.115222575	3.150118377
Observations	7	12
Hypothesized Mean Difference	0	
df	13	
t Stat	-7.329998403	
P(T<=t) two-tail	5.74769E-06	

t-Test: Two-Sample Assuming Unequal Variances

	CF Pivot	*CF Raked*
Mean	32.22540767	37.84847823
Variance	3.115222575	8.718465242
Observations	7	7
Hypothesized Mean Difference	0	
df	10	
t Stat	-4.324764852	
P(T<=t) two-tail	0.001501842	

t-Test: Two-Sample Assuming Unequal Variances

	CF Pivot Longboard	*CF Raked*
Mean	38.39107216	37.84847823
Variance	3.150118377	8.718465242
Observations	12	7
Hypothesized Mean Difference	0	

Observations	9	7
Hypothesized Mean Difference	0	
df	10	
t Stat	-7.629253066	
P(T<=t) two-tail	1.77987E-05	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Keel	*FCS Twin*
Mean	26.61696167	33.18522456
Variance	5.162771043	2.806578162
Observations	9	8
Hypothesized Mean Difference	0	
df	15	
t Stat	-6.831335946	
P(T<=t) two-tail	5.68287E-06	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Neutral Longboard	*FCS Performer*
Mean	37.598155	32.23408602
Variance	8.144196622	1.023574394
Observations	6	3
Hypothesized Mean Difference	0	
df	7	
t Stat	4.115799581	
P(T<=t) two-tail	0.004483139	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Neutral Longboard	*FCS Reactor*
Mean	37.598155	32.77820856
Variance	8.144196622	0.549831398
Observations	6	7
Hypothesized Mean Difference	0	
df	6	
t Stat	4.022333546	
P(T<=t) two-tail	0.006940419	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Neutral Longboard	*FCS Twin*
Mean	37.598155	33.18522456
Variance	8.144196622	2.806578162
Observations	6	8
Hypothesized Mean Difference	0	
df	8	
t Stat	3.376441278	
P(T<=t) two-tail	0.009692616	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Performer	*FCS Reactor*
Mean	32.23408602	32.77820856
Variance	1.023574394	0.549831398
Observations	3	7
Hypothesized Mean Difference	0	
df	3	
t Stat	-0.839860499	
P(T<=t) two-tail	0.462643633	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Performer	*FCS Twin*
Mean	32.23408602	33.18522456
Variance	1.023574394	2.806578162
Observations	3	8
Hypothesized Mean Difference	0	
df	6	
t Stat	-1.143369023	
P(T<=t) two-tail	0.296444877	

t-Test: Two-Sample Assuming Unequal Variances

	FCS Reactor	*FCS Twin*
Mean	32.77820856	33.18522456
Variance	0.549831398	2.806578162
Observations	7	8
Hypothesized Mean Difference	0	
df	10	
t Stat	-0.621149052	
P(T<=t) two-tail	0.548397861	

Observations	5	16
Hypothesized Mean Difference	0	
df	4	
t Stat	3.812205758	
P(T<=t) two-tail	0.018904298	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Flex Longboard	*Futures Triangle Longboard*
Mean	38.06939902	38.57637631
Variance	14.15762834	2.989032959
Observations	5	5
Hypothesized Mean Difference	0	
df	6	
t Stat	-0.273768652	
P(T<=t) two-tail	0.79344288	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Keel	*Futures Neutral*
Mean	25.23974669	32.63494775
Variance	4.173271522	1.038044079
Observations	4	25
Hypothesized Mean Difference	0	
df	3	
t Stat	-7.100144903	
P(T<=t) two-tail	0.005747691	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Keel	*Futures Performance Longboard*
Mean	25.23974669	38.91110511
Variance	4.173271522	11.47121793
Observations	4	7
Hypothesized Mean Difference	0	
df	9	
t Stat	-8.34789845	
P(T<=t) two-tail	1.57286E-05	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Keel	*Futures Pivot*
Mean	25.23974669	33.45346394
Variance	4.173271522	4.240808798
Observations	4	16
Hypothesized Mean Difference	0	
df	5	
t Stat	-7.180831234	
P(T<=t) two-tail	0.000815032	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Keel	*Futures Pivot Longboard*
Mean	25.23974669	39.31767148
Variance	4.173271522	8.581664482
Observations	4	3
Hypothesized Mean Difference	0	
df	3	
t Stat	-7.125097578	
P(T<=t) two-tail	0.005690206	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Keel	*Futures Rake*
Mean	25.23974669	31.63623681
Variance	4.173271522	0.259009958
Observations	4	16
Hypothesized Mean Difference	0	
df	3	
t Stat	-6.214268626	
P(T<=t) two-tail	0.008398982	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Keel	*Futures Triangle Longboard*
Mean	25.23974669	38.57637631
Variance	4.173271522	2.989032959
Observations	4	5
Hypothesized Mean Difference	0	
df	6	
t Stat	-10.41058967	
P(T<=t) two-tail	4.60239E-05	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Neutral	*Futures Performance Longboard*
Mean	32.63494775	38.91110511
Variance	1.038044079	11.47121793
Observations	25	7
Hypothesized Mean Difference	0	
df	6	
t Stat	-4.841775531	
P(T<=t) two-tail	0.00287559	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Neutral	*Futures Pivot*
Mean	32.63494775	33.45346394
Variance	1.038044079	4.240808798
Observations	25	16
Hypothesized Mean Difference	0	
df	20	
t Stat	-1.478293976	
P(T<=t) two-tail	0.154906094	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Neutral	*Futures Pivot Longboard*
Mean	32.63494775	39.31767148
Variance	1.038044079	8.581664482
Observations	25	3
Hypothesized Mean Difference	0	
df	2	
t Stat	-3.922826247	
P(T<=t) two-tail	0.05926524	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Neutral	*Futures Rake*
Mean	32.63494775	31.63623681
Variance	1.038044079	0.259009958
Observations	25	16
Hypothesized Mean Difference	0	
df	37	
t Stat	4.157331904	
P(T<=t) two-tail	0.000183015	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Neutral	*Futures Triangle Longboard*
Mean	32.63494775	38.57637631
Variance	1.038044079	2.989032959
Observations	25	5
Hypothesized Mean Difference	0	
df	5	
t Stat	-7.430685773	
P(T<=t) two-tail	0.000695624	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Performance Longboard	*Futures Pivot*
Mean	38.91110511	33.45346394
Variance	11.47121793	4.240808798
Observations	7	16
Hypothesized Mean Difference	0	
df	8	
t Stat	3.955439779	
P(T<=t) two-tail	0.004203822	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Performance Longboard	*Futures Pivot Longboard*
Mean	38.91110511	39.31767148
Variance	11.47121793	8.581664482
Observations	7	3
Hypothesized Mean Difference	0	

df	9
t Stat	0.441848676
P(T<=t) two-tail	0.669024758

df	4
t Stat	-0.191672129
P(T<=t) two-tail	0.85733566

t-Test: Two-Sample Assuming Unequal Variances

	Futures Performance Longboard	*Futures Rake*
Mean	38.91110511	31.63623681
Variance	11.47121793	0.259009958
Observations	7	16
Hypothesized Mean Difference	0	
df	6	
t Stat	5.655029255	
P(T<=t) two-tail	0.001312919	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Performance Longboard	*Futures Triangle Longboard*
Mean	38.91110511	38.57637631
Variance	11.47121793	2.989032959
Observations	7	5
Hypothesized Mean Difference	0	
df	9	
t Stat	0.223822415	
P(T<=t) two-tail	0.827893636	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Pivot	*Futures Pivot Longboard*
Mean	33.45346394	39.31767148
Variance	4.240808798	8.581664482
Observations	16	3
Hypothesized Mean Difference	0	
df	2	
t Stat	-3.316975468	
P(T<=t) two-tail	0.080118828	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Pivot	*Futures Rake*
Mean	33.45346394	31.63623681
Variance	4.240808798	0.259009958
Observations	16	16
Hypothesized Mean Difference	0	
df	17	
t Stat	3.426665328	
P(T<=t) two-tail	0.003216633	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Pivot	*Futures Triangle Longboard*
Mean	33.45346394	38.57637631
Variance	4.240808798	2.989032959
Observations	16	5
Hypothesized Mean Difference	0	
df	8	
t Stat	-5.51502491	
P(T<=t) two-tail	0.000563674	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Pivot Longboard	*Futures Rake*
Mean	39.31767148	31.63623681
Variance	8.581664482	0.259009958
Observations	3	16
Hypothesized Mean Difference	0	
df	2	
t Stat	4.528890415	
P(T<=t) two-tail	0.045456157	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Pivot Longboard	*Futures Triangle Longboard*
Mean	39.31767148	38.57637631
Variance	8.581664482	2.989032959
Observations	3	5
Hypothesized Mean Difference	0	
df	3	
t Stat	0.398617152	
P(T<=t) two-tail	0.716851679	

t-Test: Two-Sample Assuming Unequal Variances

	Futures Rake	*Futures Triangle Longboard*
Mean	31.63623681	38.57637631
Variance	0.259009958	2.989032959
Observations	16	5
Hypothesized Mean Difference	0	
df	4	
t Stat	-8.856984477	
P(T<=t) two-tail	0.000897372	