



Phil Erlanger Research Co., Inc.

www.quantpartners.com/research/erlanger/about.html

Phil Erlanger Research provides advanced technical analysis research and data to the corporate and institutional financial community. State-of-the-art computational techniques are combined with important, proprietary market data, enabling Phil Erlanger Research to offer:

- **Independent, value-added data and analysis on over 6000 equity issues, 146 industry groups and 24 sectors.**
- **Unique data series (such as normalized data on short selling activity, and on relative strength pattern recognition algorithms).**
- **Daily CSV files (single file per date with symbol/cusip listed vertically – variable heading in 1st line) dating back to 01/1995 available via FTP download.**

Models/Variables used for individual equities:

Power Rank

Range 1 to 100

Positive ≥ 60

Negative ≤ 30

Overall ranking utilizing both the *Technical Rank* and *Short Intensity*, with more weighting going to the Tech Rank. Normalized on a 1 to 100 scale, 100 being positive and 1 being negative. The higher the Power Rank, the more price action is putting pressure on short sellers.

Tech Rank

Range 1 to 100

Positive ≥ 60

Negative ≤ 30

Relative Strength ranking value utilizing proprietary non-linear pattern recognition algorithms to classify stocks. The pattern of relative strength is stronger the higher the Tech Rank. There are 10 patterns with 100 the strongest and 10 the weakest. Patterns of 50 and below are negative while 60 and above are positive.

Short Intensity Rank

Range 1 to 100

Heavy Shorting ≥ 60

Light Shorting ≤ 40

A weighted percentage from 100 to 0, the Short Rank normalizes the current *Erlanger Short Ratio* relative to its historical range for each stock. This allows for the comparison of one stock to another in terms of short selling. A short intensity rank can only be compiled with at least 6 months of history. Short intensity will change on a monthly basis as the new short interest numbers are released.

Short Ratio

The Erlanger Short Ratio is calculated using the variables monthly shares short divided by the monthly average daily volume. Erlanger smoothes out the average daily volume over 12 months instead of the standard 1 month volume sample. This avoids misleading ratios during volatile market conditions and individual anomalies like analyst recommendations and earnings reports. The Erlanger Short Ratio will change on a monthly basis as the new short interest numbers are released.

Type Classification

Type 1 – Short Squeeze or Buy Recommendation

- Positive Tech Rank $\geq 70\%$
- Heavy Short Intensity $> 50\%$
- Significant Short Ratio > 1.5 days to cover

Type 2 – Recognized Strength or Hold Recommendation

- Positive Tech Rank $\geq 70\%$
- Light Short Intensity $< 30\%$
- Moderate Short Ratio < 4 days to cover

Type 3 – Shorts are Right or Sell Recommendation

- Negative Tech Rank $\leq 30\%$
- Heavy Short Intensity $> 50\%$
- Significant Short Ratio > 1.5 days to cover

Type 4 – Long Squeeze or Short Recommendation

- Negative Tech Rank $\leq 30\%$
- Light Short Intensity $< 30\%$
- Moderate Short Ratio < 4 days to cover

Group Data:

Industry/Group Ranking

A non-capitalization weighted relative ranking system that compares all 146-industry groups in the Erlanger database. A ranking of 1 is the most positive ranking for an industry group. A ranking of 146 is the most negative ranking for a group.

1 through 35 is considered positive/buys

36 through 89 is considered neutral/holds

90 through 146 is considered negative/sells or shorts

Group Average Ranks

GroupAvgTechRank – Positive > 50 Negative < 50

GroupAvgPowerRank – Positive > 50 Negative < 50

GroupAvgShortRank – Heavy Shorting >= 60 Light Shorting <= 30

An unweighted roll up for the 146 Industry Groups of key proprietary Erlanger variables.

Group Type % (see Type Classification)

Summary data points that demonstrate the number or % of stocks in a particular group with a Type designation at that date.

Calculation is: *# of Stocks with X Type / Total Number of Stocks in Group*

GroupType1Pct = technically strong stocks with heavy short activity

GroupType2Pct = technically strong stocks with light short activity

GroupType3Pct = technically weak stocks with heavy short activity

GroupType4Pct = technically weak stocks with light short activity

Group Short Squeeze Potential

Calculation is: *Group Type1Pct + Group Type3Pct*

A higher percentage number (>=20%) will indicate the potential for a short squeeze in a particular group because a high number of stocks have a Short Rank > 50% and Short Ratio > 1.5 days. You would want to avoid shorting or be long these groups.

Group Long Squeeze Potential

Calculation is: *Group Type2Pct + Group Type4Pct*

A high percentage number (>=20%) will indicate the potential for a long squeeze in a particular group because a high number of stocks have a Short Rank < 30% and Short Ratio < 4 days. You would want to short or cover longs in these groups.

Sector Data:

Sector Ranking

A non-capitalization weighted relative ranking system that compares all 24 sectors in the Erlanger database. A ranking of 1 is the most positive ranking for a sector. A ranking of 24 is the most negative ranking for a sector.

1 through 8 is considered positive/buys

9 through 16 is considered neutral/holds

17 through 24 is considered negative/sells or shorts

Sector Average Ranks

SectorAvgTechRank – Positive > 50 Negative < 50

SectorAvgPowerRank – Positive > 50 Negative < 50

SectorAvgShortRank – Heavy Shorting ≥ 60 Light Shorting ≤ 30

An unweighted roll up for the 24 Sectors of key proprietary Erlanger variables.

Sector Type % (see Type Classification)

Summary data points that demonstrate the number or % of stocks in a particular Sector with a Type designation at that date.

Calculation is: $\# \text{ of Stocks with } X \text{ Type} / \text{Total Number of Stocks in Sector}$

SectorType1Pct = technically strong stocks with heavy short activity

SectorType2Pct = technically strong stocks with light short activity

SectorType3Pct = technically weak stocks with heavy short activity

SectorType4Pct = technically weak stocks with light short activity

Sector Short Squeeze Potential

Calculation is: $\text{Sector Type1Pct} + \text{Sector Type3Pct}$

A higher percentage number ($\geq 20\%$) will indicate the potential for a short squeeze in a particular sector because a high number of stocks have a Short Rank > 50% and Short Ratio > 1.5 days. You would want to avoid shorting or be long these sectors.

Sector Long Squeeze Potential

Calculation is: $\text{Sector Type2Pct} + \text{Sector Type4Pct}$

A high percentage number ($\geq 20\%$) will indicate the potential for a long squeeze in a particular sector because a high number of stocks have a Short Rank < 30% and Short Ratio < 4 days. You would want to short or cover longs in these sectors.



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Quick Data Reference (FTP site: <ftp1.erlangerresearch.com>)

Column Header	Sample Data Format	Range	Positive	Negative
Symbol	AA			
Issue	Alcoa Inc			
PowerRank	32	7 to 100	>=60 Positive	<=30 Negative
TechRank	10	10 to 100	>=60 Positive	<=30 Negative
ShortRank	75	0 to 100	>=60 Heavy Shorting	<=40 Mild Shorting
ShortRatio	3.28	0.00 to XX.XX		
GroupName	Aluminum			
GroupRank	136	1 to 146	<=35 Strong Group	>=90 Weak Group
GroupAvgTechRank	26.67	10 to 100	>50 Positive	< 50 Negative
GroupAvgPowerRank	31.67	7 to 100	>50 Positive	< 50 Negative
GroupAvgShortRank	41.67	0 to 100	>50 Heavy Shorting	<50 Mild Shorting
GroupType1Pct	0	0 to 100	>=20%	
GroupType2Pct	0	0 to 100		
GroupType3Pct	33.33	0 to 100		
GroupType4Pct	0	0 to 100		>=20%
GroupShortSqueezePotential	33.33	0 to 100	>=20%	
GroupLongSqueezePotential	0	0 to 100		>=20%
SectorName	NON-ENERGY MINERALS			
SectorRank	18	1 to 24	<=8 Strong Sector	>=17 Weak Sector
SectorAvgTechRank	40.52	10 to 100	>50 Positive	< 50 Negative
SectorAvgPowerRank	42.98	7 to 100	>50 Positive	< 50 Negative
SectorAvgShortRank	51.33	0 to 100	>50 Heavy Shorting	<50 Mild Shorting
SectorType1Pct	6.9	0 to 100	>=20%	
SectorType2Pct	8.62	0 to 100		
SectorType3Pct	18.97	0 to 100		
SectorType4Pct	15.52	0 to 100		>=20%
SectorShortSqueezePotential	25.87	0 to 100	>=20%	
SectorLongSqueezePotential	24.14	0 to 100		>=20%
Type	3	Blank, 1, 2, 3, or 4	Type 1	Type 4