

# Industry Classification, Redefined

How a unique approach to classification systems provides a highly customizable set of industry groups for enhanced Alpha & Risk purposes

# Agenda

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- I. Traditional Classification Systems
- II. The Revere Approach
- III. Building Industry Groups
- IV. Comparison of Revere versus GICS

# The 3 tenets of the “Traditional” Approach

## Rigidity

*Imposed stability, usually inaccurate*

## Declared/Singular Lines of Business

*Companies operate and compete across multiple industry sectors, yet, are classified in a single industry vertical*

*About 3-4% of companies change their Primary Line of Business*

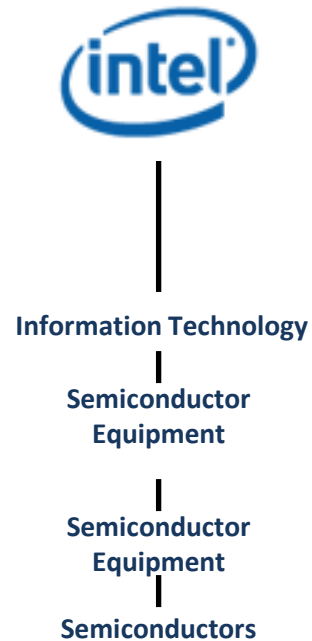
*How exactly is change defined traditionally?*

## 4 Levels of Granularity

*Each company must be classified at the lowest industry group level.*

*What about companies that exist in multiple sub-industry groups, but the same top level industry?*

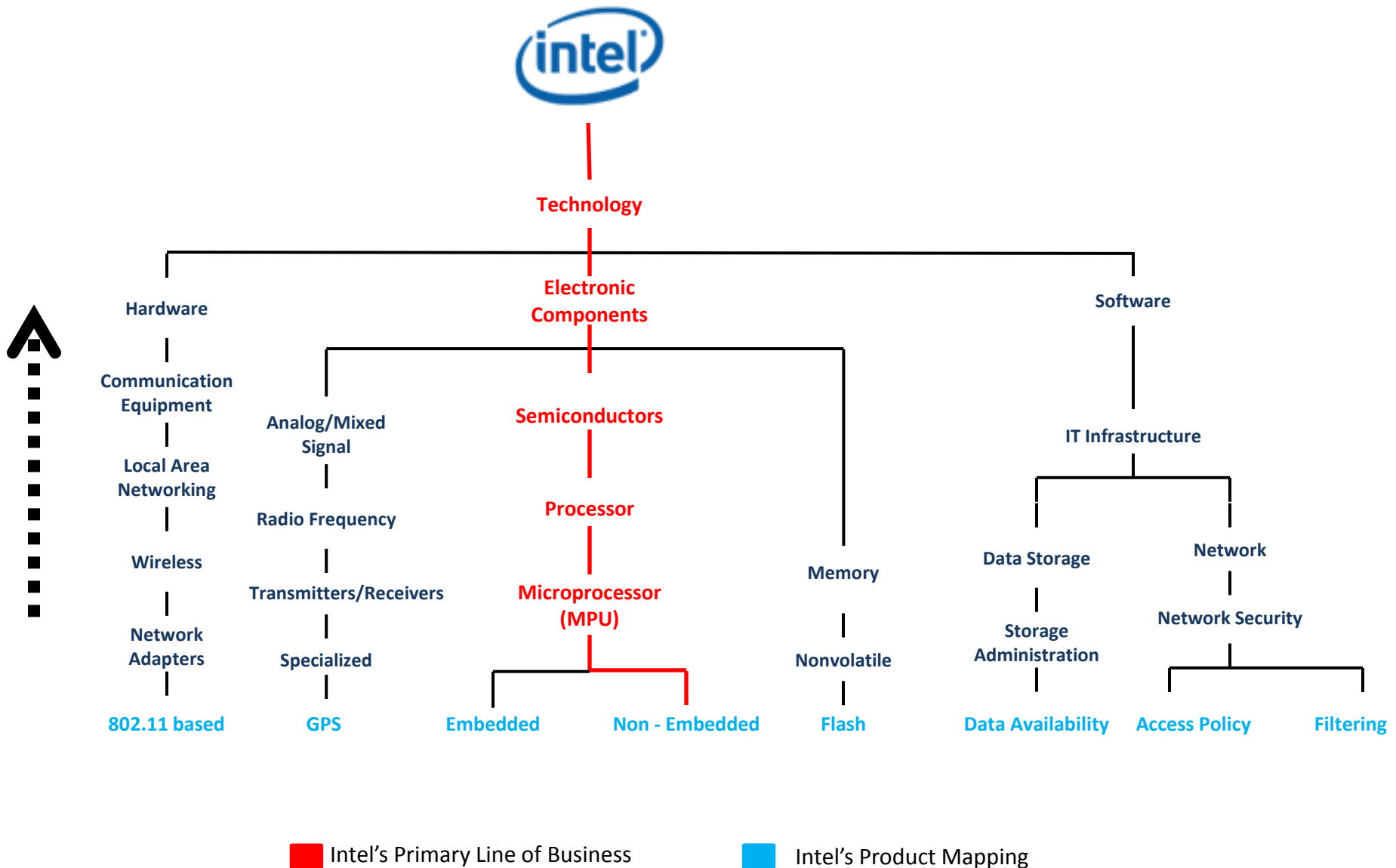
# Lets look at an example...



Convenient, but is Intel really just a semi-conductor company?

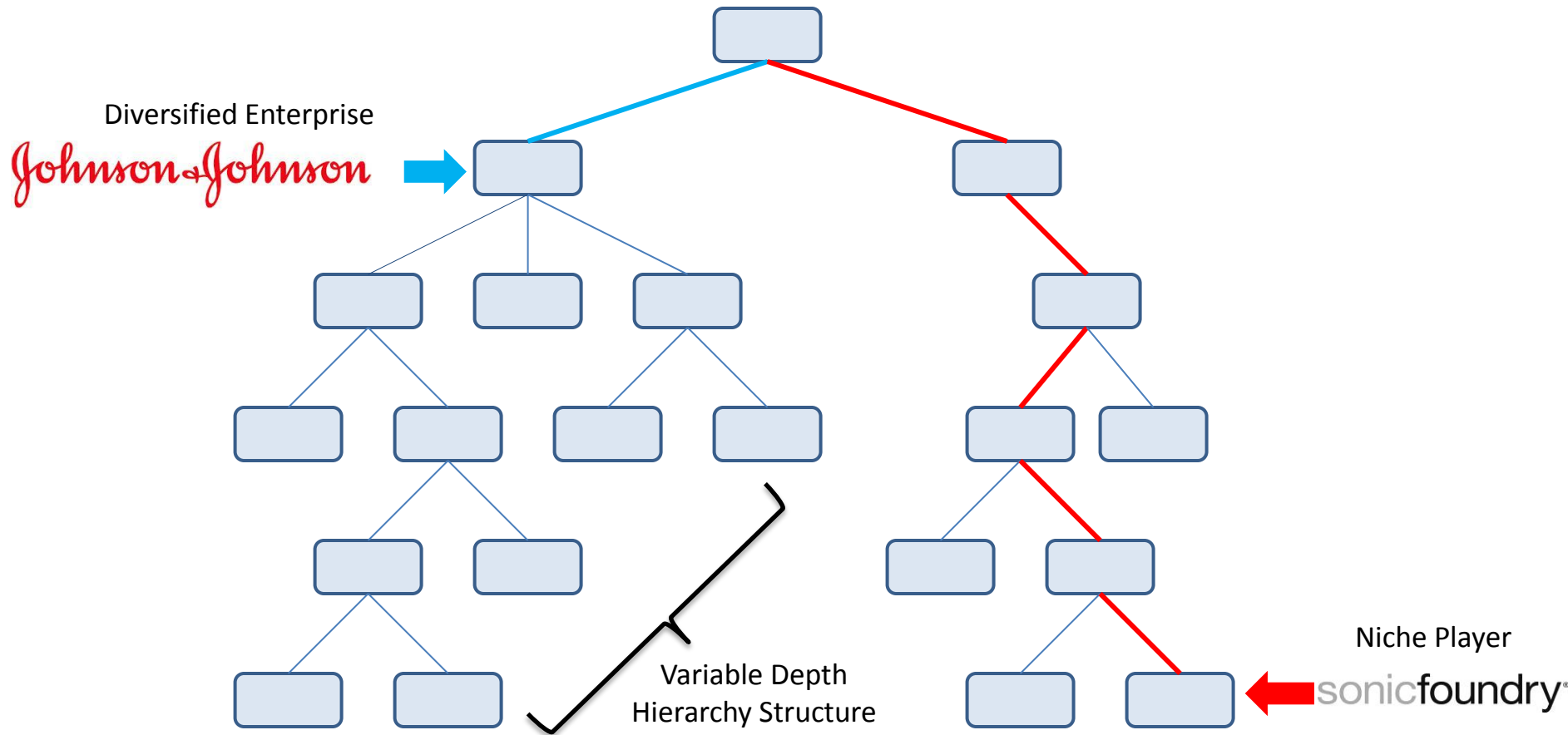
# Lets start with Intel's products & services.

## Where do they compete?



# Revere Hierarchy™ – Agile & Granular

Revere's deep visibility into the **REAL Line of Business** provides a highly agile classification scheme

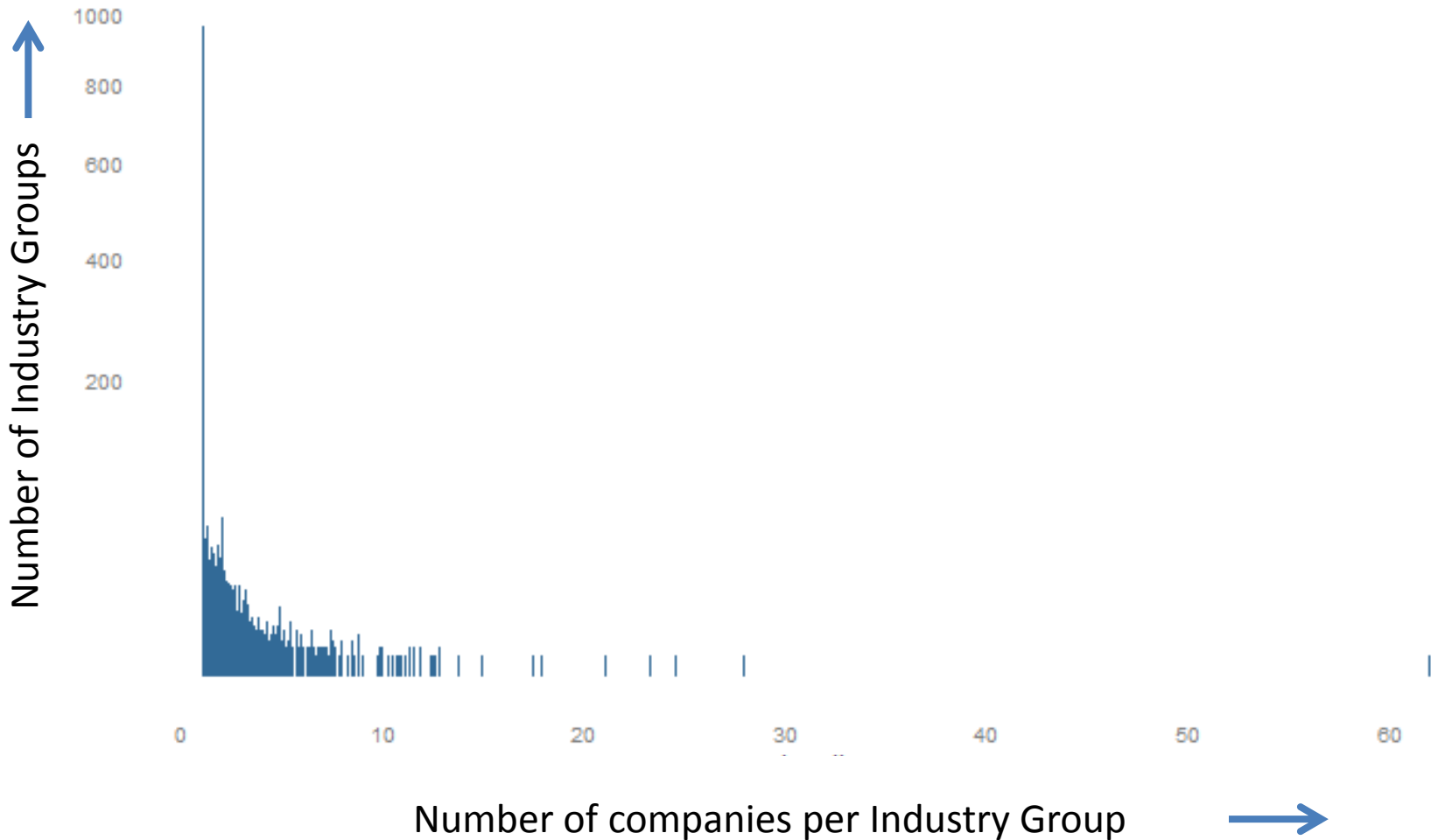


By introducing an Dynamic Depth & Breadth Classification Scheme...

... we're redefining the creation and construction of Industry Groups

# Building Industry Groups

Here's what the "Raw" Tree structure looks like for the R3K....

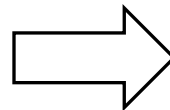
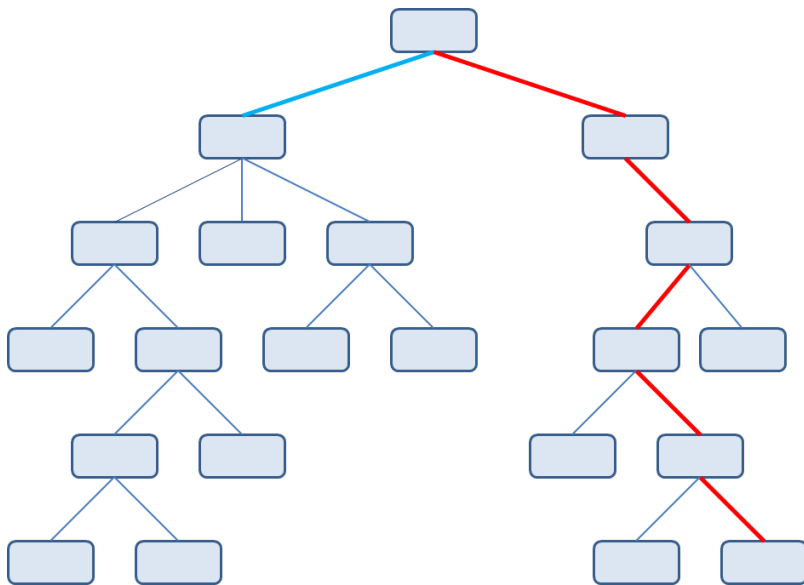




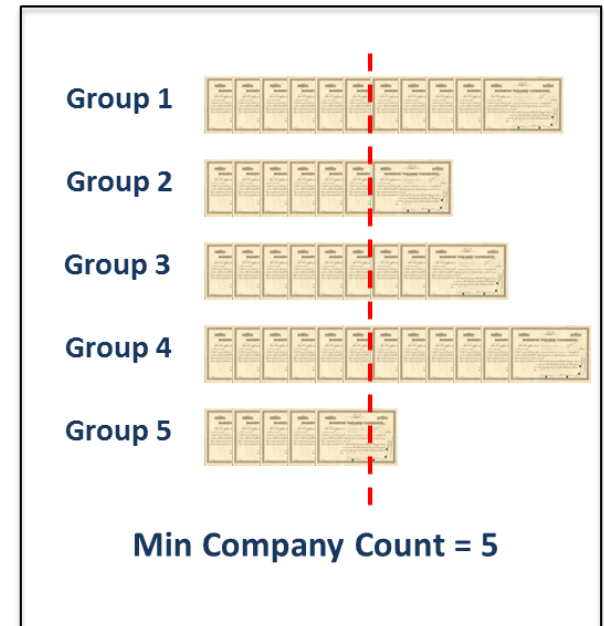
# A Bottom Up Approach to creating Industry Groups based off their Fundamental Lines of Business

Employing a bottom-up clustering algorithm, with only 1 parameter:  
**Number of Companies per group**

We take this tree structure...



And flatten it into delineated Industry Groups



# Building Industry Groups

Number of Functional Groups			
	GICS	Revere Hierarchy	Minimum Count
Level 2	10	7	-
Level 4	24	31	60
Level 6	67	86	20
Level 8	160	180	10
*Level 10	-	349	5

## Univariate Statistics of Number of Firms per Industry Group

	GICS2	REVERE2	GICS4	REVERE4	GICS6	REVERE6	GICS8	REVERE8	REVERE10
#Average Groups Per Day	10	7	24	31	70	86	159	180	349
Mean	251.0	340.7	104.6	80.3	37.2	29.0	16.8	14.0	7.2
Standard Deviation	163.7	139.1	58.0	35.0	33.1	13.8	18.5	7.5	4.6

# What do the new distributions look like?

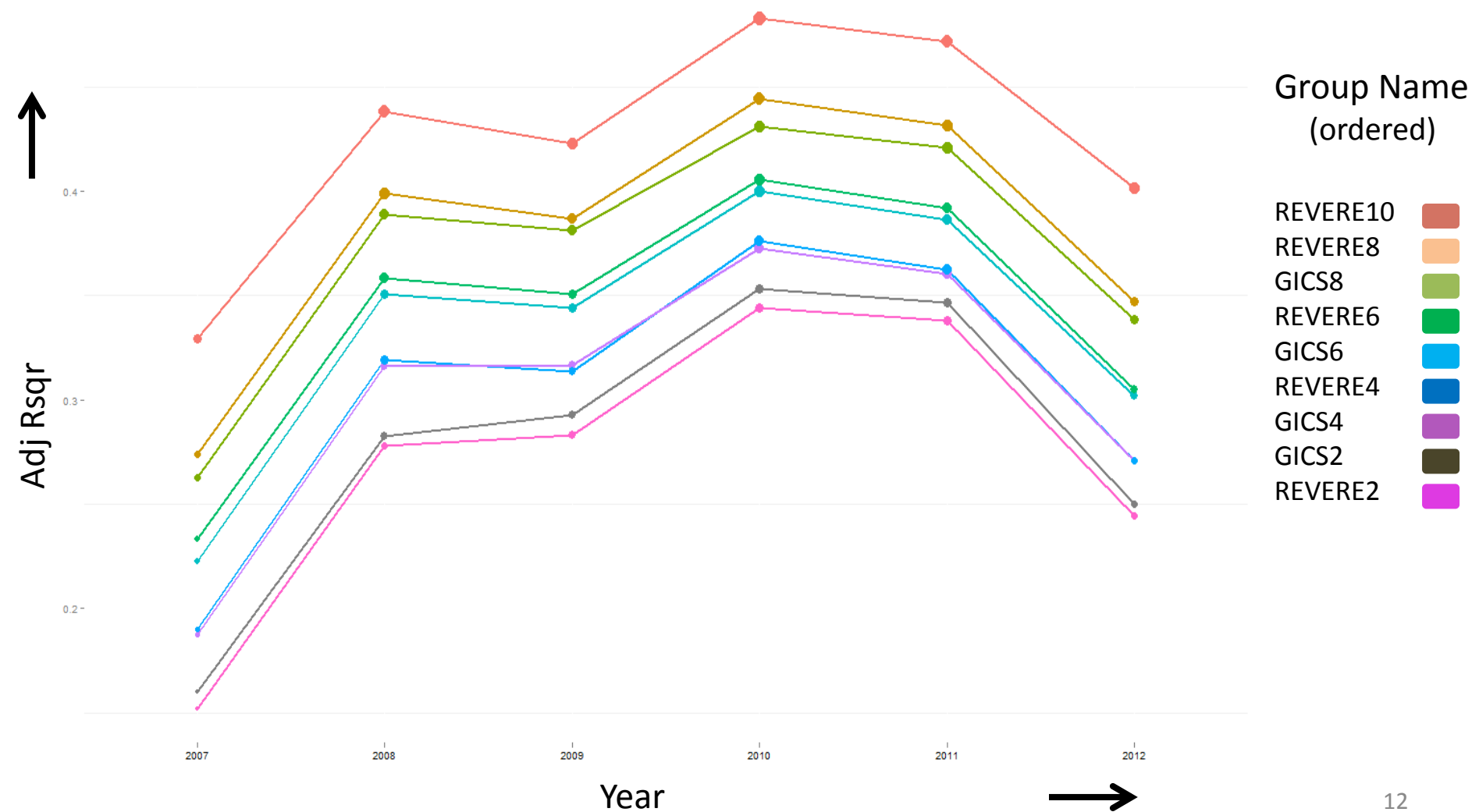
## Here's a comparison of GICS to Revere Hierarchy



# Pooled Regression Tests, Russell 3K

## *Annual price co-movement comparison*

$$\Delta\text{Price}_{j,t} = \alpha_t + \beta\Delta\text{Price}_{\text{group},t} + \varepsilon_{j,t}$$



# Pooled Regression Tests, Russell 3K

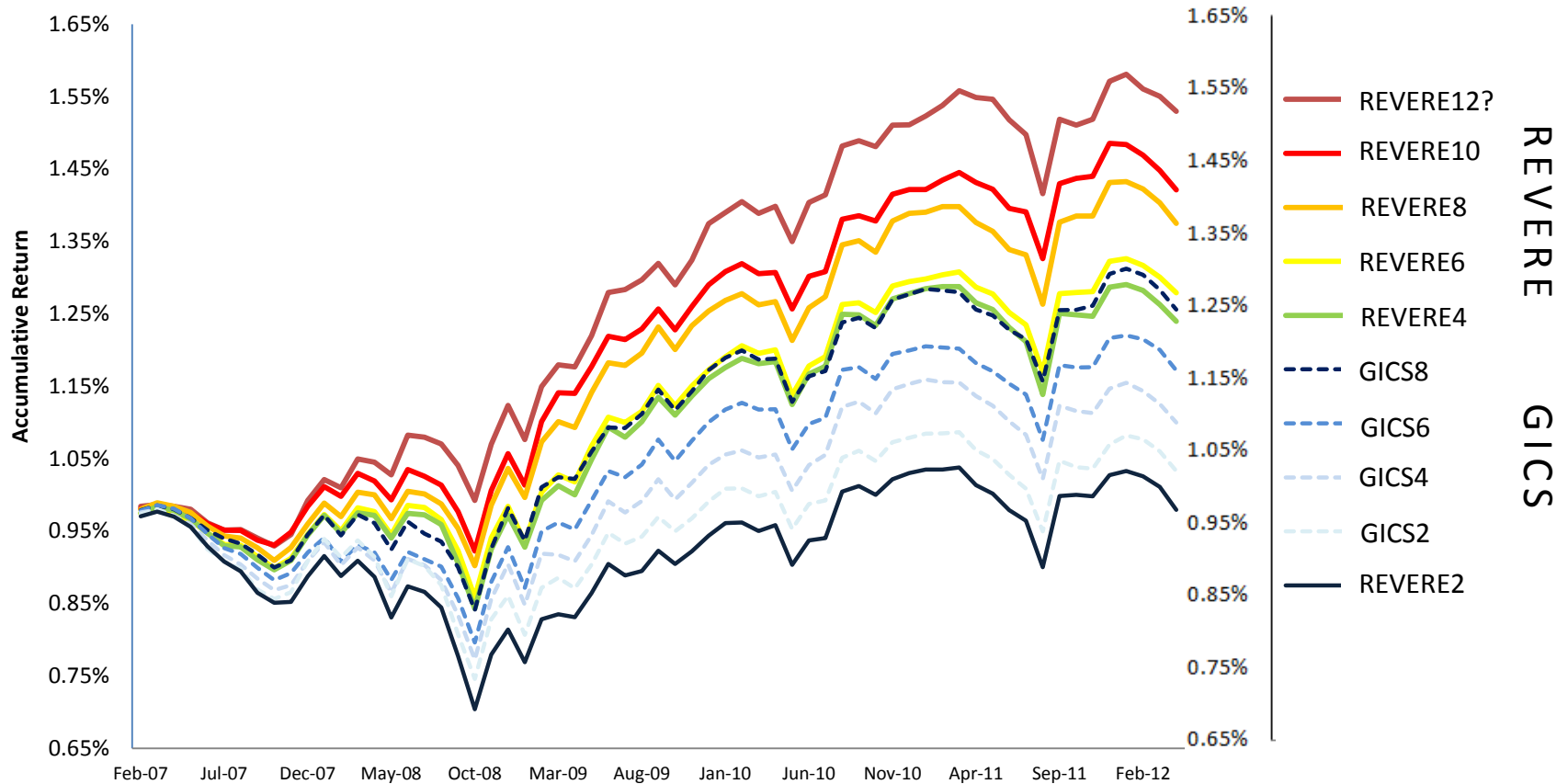
## *Annualized results for Valuation Multiple/Financial Ratios*

$$\text{Variable}_{j,t} = \alpha_t + \beta \text{Variable}_{\text{group},t} + \varepsilon_{j,t}$$

<b>Variables Tested</b>	<b>GICS 2</b>	<b>REVERE 2</b>	<b>GICS 4</b>	<b>REVERE 4</b>	<b>GICS 6</b>	<b>REVERE 6</b>	<b>GICS 8</b>	<b>REVERE 8</b>	<b>REVERE 10</b>
<b>P/B</b>	<b>7.2%</b>	6.7%	11.9%	<b>12.5%</b>	16.0%	<b>16.3%</b>	20.2%	<b>22.3%</b>	<b>27.9%</b>
<b>P/E</b>	<b>0.5%</b>	0.5%	1.5%	<b>2.3%</b>	3.5%	<b>5.2%</b>	6.3%	<b>9.3%</b>	<b>14.4%</b>
<b>P/S</b>	<b>15.8%</b>	13.5%	26.7%	<b>29.4%</b>	33.0%	<b>36.1%</b>	38.5%	<b>43.8%</b>	<b>50.3%</b>
<b>Price Return</b>	<b>28.4%</b>	27.7%	30.8%	<b>31.0%</b>	33.8%	<b>34.7%</b>	37.5%	<b>38.9%</b>	<b>43.6%</b>
<b>Asset Turnover</b>	<b>35.5%</b>	31.1%	46.4%	<b>49.0%</b>	51.5%	<b>54.3%</b>	60.8%	<b>62.4%</b>	<b>68.7%</b>
<b>Enterprise Value/Sales</b>	<b>21.0%</b>	19.5%	44.0%	<b>44.3%</b>	49.1%	<b>50.9%</b>	54.7%	<b>58.8%</b>	<b>65.8%</b>
<b>Leverage</b>	<b>27.9%</b>	26.7%	43.6%	<b>43.9%</b>	45.4%	<b>50.6%</b>	53.1%	<b>53.4%</b>	<b>59.5%</b>
<b>Profit Margin</b>	<b>11.1%</b>	10.2%	14.2%	<b>14.4%</b>	16.5%	<b>20.7%</b>	21.4%	<b>26.3%</b>	<b>33.4%</b>
<b>R&amp;D</b>	<b>20.2%</b>	19.5%	27.3%	<b>32.2%</b>	36.0%	<b>37.2%</b>	37.1%	<b>42.7%</b>	<b>46.6%</b>
<b>Return On Assets</b>	<b>6.8%</b>	6.9%	9.4%	<b>10.7%</b>	13.1%	<b>15.4%</b>	17.8%	<b>20.7%</b>	<b>27.9%</b>
<b>Return on Equity</b>	<b>6.0%</b>	5.6%	8.5%	<b>8.9%</b>	12.3%	<b>13.1%</b>	17.0%	<b>18.5%</b>	<b>24.8%</b>

# Mean Reversion Strategy Using Primary Classification Path

Mean Reversion Strategy Parameters  
2/28/2007 to 4/30/2012 time horizon  
Russell 3000 Universe  
Long/short quintal, monthly rebalance



# Mean Reversion Strategy

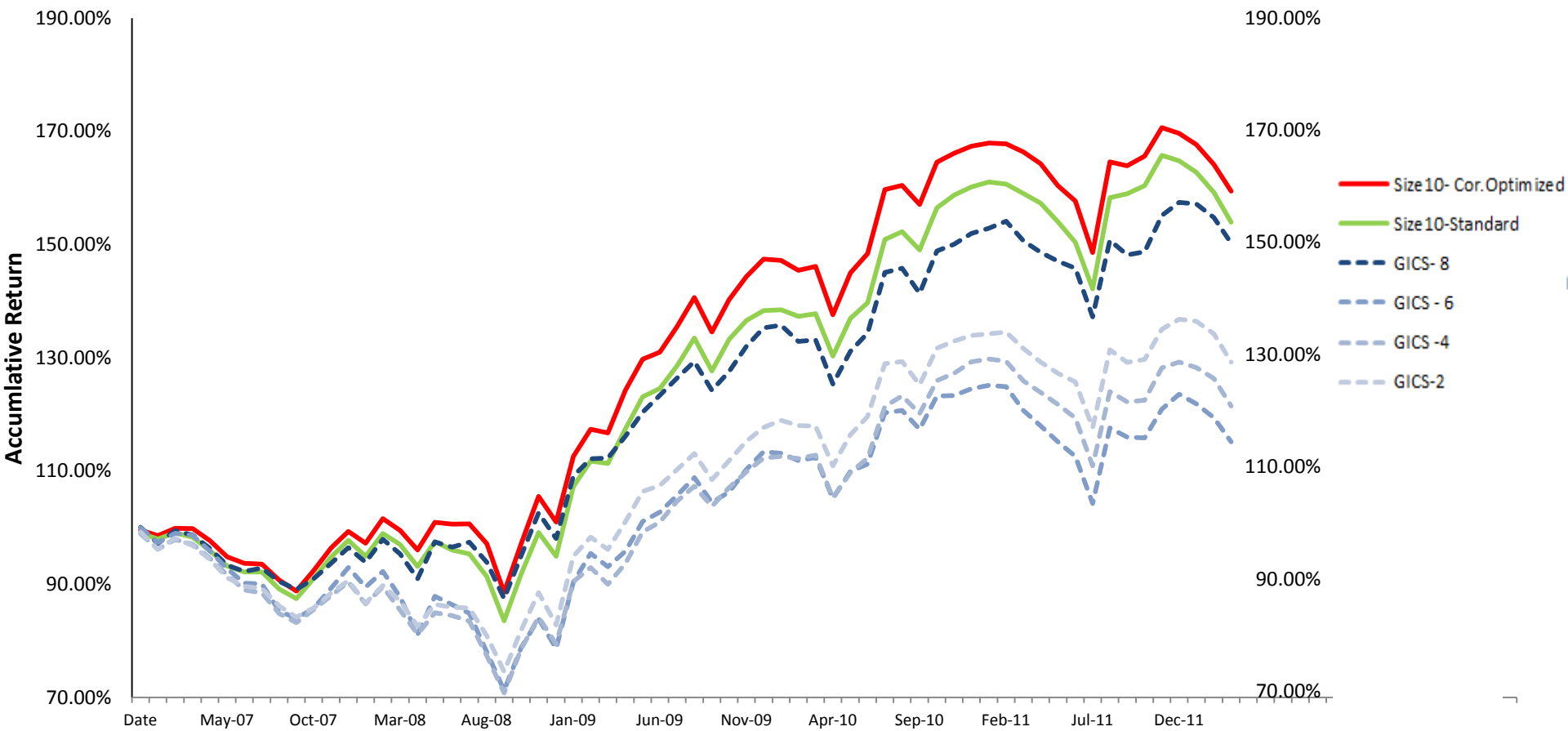
## Hybrid Clustering – Using Participant Tags + Correlations

Mean Reversion Strategy Parameters.

1/31/2007 to 4/30/2012 time horizon

Russell 3000 Universe

Long/Short, monthly rebalance



# Thank You

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# Building Industry Groups

Number of Functional Groups			
	GICS	Revere Hierarchy	Minimum Count
Level 2	10	7	-
Level 4	24	26	74
Level 6	67	72	24
Level 8	160	166	11
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## Univariate Statistics of Number of Firms per Industry Group

	GICS2	REVERE2	GICS4	REVERE4	GICS6	REVERE6	GICS8	REVERE8	REVERE10
#Average Groups Per Day	10	7	24	31	70	86	159	180	349
Mean	244.532308	101.888462	35.217901	15.718334	84.484774	27.747366	13.930032	6.499777	256.376570
Standard Deviation	163.7	139.1	58.0	35.0	33.1	13.8	18.5	7.5	4.6

# Appendix

<b>Variables Tested</b>	<b>GICS 2</b>	<b>REVERE 2</b>	<b>GICS 4</b>	<b>REVERE 4</b>	<b>GICS 6</b>	<b>REVERE 6</b>	<b>GICS 8</b>	<b>REVERE 8</b>	<b>REVERE 10</b>
P/B	7.4%	6.9%	12.1%	12.0%	16.2%	15.4%	20.5%	21.8%	28.0%
P/E	0.5%	0.5%	1.5%	2.2%	3.6%	4.5%	6.4%	9.0%	14.2%
P/S	16.2%	13.8%	27.5%	29.8%	33.9%	35.5%	39.5%	43.8%	50.9%
Price Return	29.3%	28.5%	31.6%	31.3%	34.4%	34.5%	38.0%	39.2%	44.4%
Asset Turnover	35.8%	31.3%	46.8%	47.1%	51.8%	52.9%	61.1%	61.5%	68.8%
Enterprise Value/Sales	21.1%	19.6%	44.2%	45.3%	49.3%	48.9%	55.0%	58.1%	66.1%
Leverage	27.6%	26.4%	43.3%	42.5%	45.2%	48.4%	52.9%	52.7%	59.4%
Profit Margin	11.0%	10.2%	14.3%	13.8%	16.6%	19.2%	21.6%	26.1%	33.4%
R&D	20.4%	19.2%	28.6%	31.2%	38.1%	37.0%	39.4%	41.7%	46.2%
Return On Assets	6.8%	6.8%	9.4%	10.1%	13.3%	14.3%	18.2%	20.2%	27.9%
Return on Equity	5.8%	5.4%	8.4%	8.3%	12.4%	11.7%	17.2%	17.8%	24.5%