AIv3 CONSOLIDATION PATTERN COMPREHENSIVE ANALYSIS REPORT

Report Generated: 12 September 2025 at 23:19:19
Analysis Period: Full Historical Data
Data Source: Google Cloud Storage (GCS)
Total Patterns Analyzed: 6,862
Analysis Version: AIv3 Enhanced v2.0

KEY PERFORMANCE INDICATORS

Exceptional Patterns (K4 - >75% gain): 486 (7.1%)
Strong Patterns (K3 - 35-75% gain): 1,301 (19.0%)
Quality Patterns (K2 - 15-35% gain): 2,061 (30.0%)
Total Success Rate: 56.1%

EXECUTIVE SUMMARY

Analysis Overview:
This comprehensive analysis examined 6,862 consolidation patterns across multiple securities using complete historical data from Google Cloud Storage. The analysis focuses on identifying high-probability consolidation patterns that precede significant price movements.

Key Findings:
• Average Pattern Duration: 10.0 days
• Average Boundary Width: 8.8%
• Average Volume Contraction: 0.60
• Average Maximum Gain: 31.7%

Performance Metrics:
• Overall Success Rate: 56.1%
• Total Successful Patterns: 3,848
• Average Gain (Successful): 51.7%
• Median Gain (Successful): 33.0%
• 90th Percentile Gain: 83.5%

Risk Metrics:
• Failed Patterns (K5): 90
• Failure Rate: 1.3%
• Risk-Reward Ratio: 51.69

DETAILED DATASET ANALYSIS

1. Pattern Duration Distribution

The pattern duration analysis reveals important insights about consolidation timeframes:

• Minimum Duration: 10 days
• 25th Percentile: 10 days
• Median Duration: 10 days
• 75th Percentile: 10 days
• Maximum Duration: 10 days
• Standard Deviation: 0.0 days

Interpretation: Patterns with duration between 10 and 10 days represent the core 50% of observations and may offer the best risk-reward profile.

2. Boundary Width Analysis

Boundary width indicates the volatility range during consolidation:

• Tightest Pattern: 0.1%
• Median Width: 9.1%
• Mean Width: 8.8%
• Widest Pattern: 15.0%

Key Insight: Patterns with boundary width below 6.4% (25th percentile) show tight consolidation and may have higher breakout potential.

3. Volume Contraction Analysis

Volume contraction is a critical indicator of consolidation strength:

• Average Contraction: 0.60
• Median Contraction: 0.62
• Strongest Contraction: 0.00
• Weakest Contraction: 1.19

Trading Insight: Patterns with volume contraction below 0.51 indicate strong consolidation with reduced trading interest before potential breakout.

4. Data Quality Metrics

Metric	Value	Status
Total Records	6,862	Good
Missing Values	119	Check
Duplicate Patterns	0	Clean
Data Completeness	99.8%	Complete

PATTERN PERFORMANCE ANALYSIS

1. Performance by Outcome Classification

Class	Count	Percentage	Avg Gain	Max Gain	Success Rate
K4	486	7.1%	174.8%	716.3%	✓
K3	1,301	19.0%	49.6%	74.9%	✓
K2	2,061	30.0%	24.0%	35.0%	✓
K1	1,581	23.0%	9.6%	15.0%	✗
K0	1,343	19.6%	2.4%	5.0%	✗
K5	90	1.3%	-0.6%	0.0%	✗

2. Advanced Performance Metrics

Successful Patterns Analysis (K2-K4):
• Total Count: 3,848 patterns
• Average Gain: 51.69%
• Median Gain: 33.05%
• Standard Deviation: 63.87%
• Skewness: 4.23
• Kurtosis: 21.13

Pattern Characteristics of Successful Trades:
• Average Duration: 10.0 days
• Average Boundary Width: 9.31%
• Average Volume Contraction: 0.613

Percentile Distribution of Gains:
• 10th Percentile: 18.0%
• 25th Percentile: 23.0%
• 50th Percentile (Median): 33.0%
• 75th Percentile: 52.1%
• 90th Percentile: 83.5%
• 95th Percentile: 151.2%
• 99th Percentile: 359.8%

TEMPORAL ANALYSIS

1. Success Rate by Pattern Duration

Duration Range	Count	Success Rate	Avg Gain	K4 Rate
10-20 days	6,862	56.1%	31.7%	7.1%

2. Time to Peak Analysis

Analysis of how quickly patterns reach their maximum gain after breakout:

• Average Time to Peak: 51.3 days
• Median Time to Peak: 52 days
• Fastest Peak: 1 days
• Slowest Peak: 100 days

Strategic Insight: 52% of patterns reach their peak within 87 days, suggesting optimal holding period for maximum gains.

STATISTICAL DEEP DIVE

1. Feature Correlation Analysis

Key Correlations Discovered:

• Duration vs Max Gain: nan
• Boundary Width vs Max Gain: -0.039
• Volume Contraction vs Max Gain: -0.091
• Volatility vs Max Gain: -0.009

Interpretation:

2. Statistical Significance Tests

Feature	Successful Mean	Failed Mean	Difference	P-Value	Significant
duration	10.00	10.00	0.00	nan	✗
boundary_width	9.31	8.13	1.17	0.0000	✓
volume_contraction	0.61	0.57	0.04	0.0000	✓

RISK ANALYSIS

1. Risk Metrics Overview

Failure Analysis:
• Total Failed Patterns (K5): 90
• Failure Rate: 1.3%
• Average Loss on Failure: -0.6%
• Maximum Drawdown: -7.5%

Risk-Adjusted Returns:
• Win Rate: 56.1%
• Average Win: 51.7%
• Average Loss: -0.6%
• Profit Factor: 3831.41
• Expected Value: 31.66%

Risk Categories:
• Low Risk (K2-K4, Duration 20-40 days): 0 patterns
• Medium Risk (K1-K3, Any Duration): 4,943 patterns
• High Risk (K0, K5): 1,433 patterns

2. Volatility and Risk Distribution

Volatility Statistics:
• Mean Daily Volatility: 2.41%
• Volatility Std Dev: 1.15%
• Low Volatility Patterns (<1.72%): 1,686
• High Volatility Patterns (>3.09%): 1,686

Risk Management Recommendations:
• Focus on patterns with volatility between 1.72% and 2.34% for balanced risk
• Avoid patterns with volatility above 3.09% unless strong confirmation signals present
• Implement stop-loss at 4.8% below entry for average volatility patterns

TOP PATTERNS ANALYSIS

Top 10 Best Performing Patterns

Rank	Ticker	Duration	Boundary	Max Gain	Class
1	ACB/twelvedata_20250825	10d	11.5%	716.3%	K4
2	ACB/twelvedata_20250825	10d	4.7%	537.3%	K4
3	ACB/twelvedata_20250825	10d	4.7%	520.6%	K4
4	ACB/twelvedata_20250825	10d	6.3%	515.0%	K4
5	ACB/twelvedata_20250825	10d	5.8%	513.0%	K4
6	ACB/twelvedata_20250825	10d	5.8%	509.8%	K4
7	ACB/twelvedata_20250825	10d	7.9%	508.9%	K4
8	ACB/twelvedata_20250825	10d	11.0%	506.7%	K4
9	ACB/twelvedata_20250825	10d	4.7%	506.7%	K4
10	ACB/twelvedata_20250825	10d	4.7%	506.7%	K4

Common Characteristics of Top Performers

Analysis of top 20% performing patterns reveals:

Duration Profile:
• Average Duration: 10.0 days
• Most Common Range: 10-10 days

Boundary Characteristics:
• Average Boundary Width: 9.29%
• Optimal Range: 7.1%-11.9%

Volume Profile:
• Average Volume Contraction: 0.582
• Typical Range: 0.49-0.69

Success Formula:
The most successful patterns typically combine: • Moderate duration (10 days median) • Tight consolidation (boundary width < 9.7%) • Strong volume contraction (< 0.60)

STRATEGIC RECOMMENDATIONS

1. Pattern Selection Criteria
Based on the comprehensive analysis, prioritize patterns with:
• Duration between 10 and 10 days
• Boundary width below 9.5%
• Volume contraction below 0.63
• Clear support and resistance levels

2. Risk Management Guidelines
• Set stop-loss at 2-3% below consolidation low
• Take partial profits at +15% (K2 level)
• Hold remaining position for +35% (K3 level) or higher
• Maximum position size: 2-3% of portfolio per pattern

3. Timing Considerations
• Enter positions near the lower boundary of consolidation
• Wait for volume confirmation on breakout (>1.5x average)
• Monitor for false breakouts in first 2-3 days
• Average holding period: 74 days

4. Portfolio Optimization
• Maintain 5-10 concurrent positions for diversification
• Focus on patterns with success rate > 56%
• Avoid patterns with characteristics similar to K5 failures
• Review and rebalance weekly based on pattern evolution

5. Advanced Strategies
• Combine with momentum indicators for confirmation
• Use volume-weighted average price (VWAP) for entry timing
• Consider market regime (bull/bear) for position sizing
• Track sector rotation for additional edge

Expected Performance Metrics:
Following these recommendations should yield:
• Win Rate: 56% or higher
• Average Win: 51.7%
• Risk-Reward Ratio: 1:5.2
• Monthly Expected Return: 1.7% (assuming 30-day average hold)

CONCLUSION

This comprehensive analysis of 6,862 consolidation patterns provides a robust framework for identifying high-probability trading opportunities. The data-driven insights reveal clear patterns of success and failure, enabling systematic approach to pattern trading.

Key Success Factors:
• Pattern quality (tight consolidation, volume contraction)
• Appropriate duration (not too short, not too extended)
• Risk management (position sizing, stop-losses)
• Patience and discipline in execution

Next Steps:
1. Implement screening criteria based on optimal parameters
2. Backtest strategy with historical data
3. Start with small positions to validate approach
4. Scale gradually based on confirmed results
5. Continuously monitor and adjust parameters

Remember: Past performance does not guarantee future results. Always practice proper risk management.