# Contrarian Analysis Agent

Olav Laudy, Eric Jensen, Pierre Haren

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# Abstract

This paper introduces the Contrarian Analysis Agent, an innovative approach that leverages Structured Retrieval Augmented Generation (SRAG) to systematically identify and analyze minority viewpoints in financial markets. By combining advanced Natural Language Processing (NLP) techniques with Large Language Models (LLMs), our method addresses the limitations of traditional contrarian analysis and existing automation attempts. We demonstrate the effectiveness of this approach through a case study on Micron and the US government bond yield, highlighting its potential to enhance decision-making processes across various facets of the financial industry. The paper also discusses the benefits, challenges, and future directions of this technology, positioning the Contrarian Analysis Agent as a powerful tool for maintaining a well-rounded, critical perspective in an increasingly complex financial landscape.

# Introduction

In today's fast-paced financial markets, the ability to discern and analyze contrarian viewpoints is increasingly crucial. As information flows at an unprecedented rate, the risk of groupthink and echo chambers in financial analysis grows proportionally. The Contrarian Analysis Agent emerges as a powerful tool to combat these risks, offering a systematic approach to uncovering and evaluating perspectives that diverge from the mainstream consensus.

This paper introduces an innovative methodology that harnesses the power of Structured Retrieval Augmented Generation (SRAG) to automate the process of contrarian analysis. By leveraging advanced Natural Language Processing (NLP) techniques and Large Language Models (LLMs), our approach not only identifies prevailing sentiments but also surfaces and articulates minority opinions that may hold valuable insights for investors, analysts, and decision-makers.

We will explore how the Contrarian Analysis Agent builds upon the foundations of SRAG, extending its capabilities to provide a more nuanced and multifaceted view of financial narratives. This paper aims to demonstrate how the agent can serve as a vital tool in the modern analyst's arsenal, enabling more robust, well-rounded financial analyses and decision-making processes.

Moreover, leveraging OpenAI Agent technology, this development encapsulates the complexity of multiple layers of analysis within a single, accessible interface. This encapsulation allows the Contrarian Analysis Agent to seamlessly become a component in larger, more complex systems. Such systems can automatically invoke this agent, utilizing its natural language outputs as inputs for further processing steps. This integration capability significantly enhances the potential for automated, multi-faceted financial

analysis pipelines, where contrarian viewpoints can be systematically incorporated into broader analytical frameworks.

# Background

## Structured Retrieval Augmented Generation (SRAG)

SRAG, as introduced in our previous work on Analytics Controlled Narratives (Laudy et al., 2023), serves as the cornerstone of our Contrarian Analysis Agent approach. SRAG enhances traditional Retrieval Augmented Generation (RAG) by incorporating a symbolic database, which allows for more precise and contextually relevant information retrieval.

In the SRAG framework, financial articles are processed through an NLP parser, converting dense textual information into structured, actionable data. This structured data is then stored in a symbolic database, preserving connections to the original textual sources and enabling multifaceted analytics.

## Sentiment Analysis in Financial Markets

Sentiment analysis has long been a crucial tool in financial markets, offering insights into market perceptions and potential future trends. Traditional approaches often focus on aggregating majority opinions, potentially overlooking valuable minority viewpoints. Our Contrarian Analysis Agent method addresses this limitation by specifically seeking out and analyzing these less prevalent, yet potentially insightful, perspectives.

## Traditional Contrarian Analysis and Automation Attempts

Contrarian analysis has long been a valuable tool in financial markets, offering insights that challenge prevailing wisdom and potentially uncover overlooked opportunities or risks. Traditionally, this analysis has been largely manual, relying on the expertise and intuition of seasoned analysts.

The classic approach to contrarian analysis involves several key steps:

- Comprehensive Market Research: Analysts gather extensive data from various sources, including financial reports, news articles, and expert opinions.
- Identification of Consensus Views: They determine the prevailing market sentiment or widely accepted forecasts for a particular asset, sector, or economic indicator.

- Critical Evaluation: Analysts critically examine the assumptions underlying the consensus view, looking for potential flaws or overlooked factors.
- Alternative Scenario Development: They construct alternative scenarios that challenge the mainstream perspective, often based on different interpretations of available data or consideration of underappreciated factors.
- Risk-Reward Assessment: Finally, they evaluate the potential risks and rewards associated with taking a contrarian position.

This process, while potentially highly insightful, is time-consuming and subject to individual biases and limitations in information processing capacity.

As technology advanced, there have been various attempts to automate aspects of contrarian analysis. These attempts can be broadly categorized into several approaches:

- Quantitative Models: Some researchers have developed quantitative models to identify potential contrarian opportunities. For instance, Jegadeesh and Titman (1993) introduced a momentum strategy that, in essence, acted as a contrarian approach to short-term price movements.
- Sentiment Analysis: With the rise of natural language processing, sentiment analysis tools have been employed to gauge market sentiment and identify potential misalignments between sentiment and fundamentals. Das and Chen (2007) pioneered work in this area, using sentiment analysis on stock message boards to predict stock price movements.
- Network Analysis: Some studies have used network analysis techniques to identify contrarian opportunities. For example, Ozsoylev and Walden (2011) developed a model of information networks in financial markets that could potentially be used to identify contrarian signals.
- Machine Learning Approaches: More recently, machine learning techniques have been applied to predict market reversals or identify contrarian opportunities. For instance, Atsalakis and Valavanis (2009) used neural networks to predict stock trends, which could be adapted for contrarian analysis.

While these automation attempts have shown promise, they often face several limitations such as:

- Lack of Context: Many automated systems struggle to incorporate broader contextual factors that human analysts naturally consider.
- Difficulty in Processing Unstructured Data: A significant portion of valuable financial information comes in unstructured formats (news articles, earnings call transcripts, etc.), which many systems find challenging to process effectively.
- Overreliance on Historical Data: Many quantitative models are heavily dependent on historical data, potentially limiting their effectiveness in unprecedented market conditions.
- Inability to Generate Explanatory Narratives: While existing systems can often identify potential contrarian opportunities, they typically struggle to provide coherent, explanatory narratives for their findings.

# Methodology of Contrarian Analysis Agent

Our Contrarian Analysis Agent approach, built on the SRAG framework, aims to address these limitations by combining structured data analysis with advanced natural language processing capabilities. By leveraging Large Language Models and a symbolic database, our method can process both structured and unstructured data, incorporate contextual information, and generate explanatory narratives for its contrarian insights. The agent will detect in the question provided in natural language the following parameters: Target Company or Country, Point in Time, Set of Key Performance Indicators (KPIs) and Time Window. It will then call a proprietary Python function which is the body of the agent that follows the following steps:

1. **KPI Selection**: The agent either uses the provided set of KPIs or identifies the top five KPIs with the most extreme sentiment (positive or negative) for the target company or country within the specified time window.

2. **Sentiment Extraction**: For each selected KPI, the agent retrieves sentiment data from the symbolic database, focusing on the most extreme sentiments.

3. **Quote Retrieval**: The agent collects quotes representing both the majority opinion and the minority (contrarian) viewpoints for each KPI favoring quotes that contain "causal links" or explanations authors give for their point of view.

4. **Data Compilation**: The collected data, including KPIs, sentiments, and associated quotes, is prepared for further analysis by a LLM.

This ends the "Structured" part of our SRAG method, where we used our symbolic database of content detection to surface the most relevant available information for this contrarian analysis.

# LLM Integration for Contrarian Viewpoint Generation

The next step of our Contrarian Analysis Agent lies in the utilization of a Large Language Model (LLM) to generate readable insightful contrarian perspectives. The process involves:

1. **Data Input**: The LLM is provided with the compiled data from the previous step as contextual data, including the KPIs, majority sentiments, and associated quotes.

2. **Context Understanding**: The LLM first processes this information to understand the prevailing narrative and sentiment for each KPI.

3. **Contrarian Analysis**: The LLM then focuses on the minority viewpoints, analyzing the contrarian quotes and their implications.

4. **Synthesis**: Finally, the LLM generates a comprehensive contrarian analysis, articulating perspectives that challenge or provide alternative interpretations to the mainstream narrative.

This approach ensures that the contrarian viewpoints are not merely identified but are also contextualized and explained in a meaningful way.

*Figure 1: Flowchart of the Contrarian Analysis Agent Process*
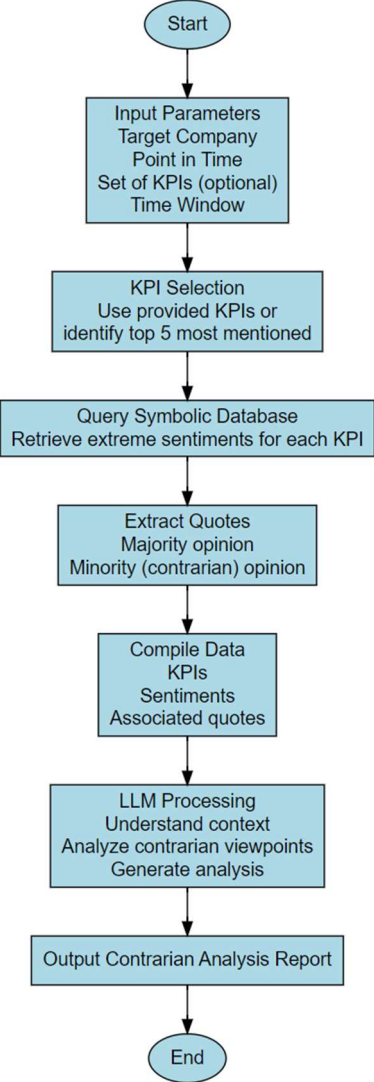
# Case Study 1: Micron Technology

To demonstrate the capabilities of the Contrarian Analysis Agent, we present a first case study focusing on Micron Technology, a prominent player in the semiconductor sector. The process begins with a simple natural language query: "Provide me a contrarian view on Micron as of 2024-06-25." The agent's LLM interprets this request and translates it into the following structured function call: get_contrarian_point_of_view({'entity': 'micron', 'as_of_date': '2024-06-25'}).

This function then constructs and executes an SQL query to retrieve relevant data from our symbolic database. The resulting dataset includes sentence IDs, which are used to fetch the full text of pertinent quotes via an API call. While the raw table of majority and minority view quotes is not displayed here for brevity, it forms the basis for the subsequent analysis.

In the final step, a second LLM processes this structured data, synthesizing the contrasting viewpoints into a coherent narrative. The output of this analysis, presenting a nuanced contrarian perspective on Micron, is illustrated in Figure 2.

This streamlined process exemplifies how the Contrarian Analysis Agent efficiently transforms a simple user query into a comprehensive, data-driven contrarian analysis, masking the complexity of the underlying data retrieval and processing steps.

We chose the date of June 25, 2024, as it was the day before the announcement of Micron's results, and we wanted to understand the type of warnings an investor would have gotten.

The agent chose 5 KPIs to focus on: profit, demand, prices, production and revenue.

Sensitivity of demand, prices and revenue to market conditions is highlighted, which should have sounded like cautionary statements contrasting with the general enthusiasm about unlimited AI demand.

All pointers in the report enable direct access to the original content (with a valid Causality Link license) to dive deeper into the authors' point of view if necessary.

This case study demonstrates how the Contrarian Analysis Agent can provide a more balanced and comprehensive view of a company's position, highlighting the latest potential risks and challenges that might be overlooked in conventional analyses.

# Contrarian Report on Micron Technology

## Micron Profit

The sentiment around Micron's profitability has been largely positive, with expectations of growth fueled by rising AI investments and improved profit margins. However, some analysts suggest potential challenges. For instance, it was noted that the company faces increasing competition which could impact its bottom line. As described in ACI Information Group, 2024-05-27, "The ruling could potentially impact Micron's bottom line, as the company faces increasing competition in the rapidly growing market for high-performance computing solutions."

## Micron Demand

The demand for Micron's memory products is believed to be robust due to the ongoing surge in AI applications. Nevertheless, Penfield from Advance Publications, 2024-06-22 warns that "If sales ease, demand for chips wanes." This introduces a cautionary note about the sustainability of current demand levels.

## Micron Prices

There is a positive outlook on Micron's pricing strategy, with expectations of rising DRAM and NAND prices. However, it is important to consider potential risks mentioned in Benzinga, 2024-06-25: "if they continue increasing capacity, when the cycle turns, the supply will become greater than the demand, leading to a plunge in pricing." This suggests that any misstep in capacity management could adversely affect prices.

## Micron Production

Micron's production capacity has seen significant improvements, with substantial investments and expansions planned. Nonetheless, Zacks Investment Research, 2024-06-20 raises a concern: "The company's margins might also be strained by a higher mix of lower-margin NAND products and only minimal reductions in manufacturing costs." Further compounding this, reports from ACI Information Group, 2024-06-19 noted, "WD and Micron were said to have cut production by over 50%," which could indicate underlying production issues or strategic caution.

## Micron Revenue

The outlook on Micron's revenue growth is generally optimistic, driven by increased AI-related demand. However, Metropolis Business Media, 2024-06-18 pointed out, "Micron expects a slight decline in unit shipments," which may signal potential revenue vulnerabilities amid the broader growth predictions.

# Case Study 2: USA Government Bond Yield

Our second example will focus on a much talked about KPI for the United States, the Treasuries, which are mostly discussed through the concept of government bond yield.

The process begins again with a simple natural language query: "Provide me a contrarian view on US with the KPI government bond yield." The agent's LLM interprets this request and translates it into a function call: get_contrarian_point_of_view({'entity': 'usa', 'KPI': 'government_bond_yield'}).

The rest of the process is identical to the first example, and the resulting report is displayed in the following figure. Note that a "negative" sentiment means that most recent detections mention that the yield will go down.

*Figure 3: Contrarian Example for US government bond yield as of 06/26/24*

## Contrarian Analysis of USA Government Bond Yield

Based on the provided report, the predominant sentiment regarding the USA government bond yield is negative. The majority of sources indicate declining yields due to various economic factors such as cooling inflationary pressures, hopes of Federal Reserve rate cuts, and weaker-than-expected retail sales reports.

## Contrarian Viewpoint

Despite the prevailing negative sentiment surrounding declining Treasury yields, certain data points present a contrarian perspective indicating an upward trend in some instances. Here are several quotes that support this contrarian view:

- Pakistan Press International (2024-06-23): "The yield on the Canadian 10-year government bond rebounded to over 3.37% from a four-month low of 3.28% observed on June 14th, following higher US Treasury yields amid signs of a strong US economy, while Canadian data showed mixed results."
- SyndiGate Media Inc. (2024-06-11): "The dollar received a boost from Friday's stronger-than-expected jobs report, supported by higher Treasury yields as traders pared back bets for Fed rate cuts this year."
- Zacks Investment Research (2024-06-11): "A stronger jobs report diminished rate cut bet hopes to end the week, leading to a spike in Treasury yields."
- ContentEngine (2024-06-11): "The U.S. currency was helped by rising Treasury yields after surprisingly strong employment data late last week, which prompted a sharp reduction in bets for Fed rate cuts this year."
- Action Economics (2024-06-10): "10-year Bund and Treasury yields are slightly higher, despite the pickup in risk aversion in some parts."
- ACI Information Group (2024-06-10): "The 10-year US Treasury yield rose nearly 15 bp after the employment report, is up another couple of basis points today to 4.45%."
- Zacks Investment Research (2024-06-10): "Later in the week, investors seemed to suggest a lesser probability of a September rate cut, which pushed treasury yields higher."
- Thai News Service (2024-06-09): "These concerns were prompted by poor inflation data from the United States, which led to a sharp rise in US yields - for example of around 70 basis points for the two-year US Treasury within one week."
- NewsBank (2024-06-08): "Stocks are mixed on Wall Street and Treasury yields are sharply higher Friday after the government released a jobs report whose headline numbers came in hotter than expected but still showed some signs of moderating."

Therefore, while the predominant sentiment around Treasury yields is negative, these quotes highlight instances where Treasury yields have risen due to factors like strong employment data, reduced expectations for Federal Reserve rate cuts, and mixed economic data. It is important to consider these contrarian factors as they may point to a more nuanced and dynamic economic environment than the majority sentiment suggests.

The predominant sentiment viewpoint emphasizes reasons to expect lower yields: the cooling of inflation, weakness in retail sales and potential Fed rates cuts. The contrarian viewpoint highlights the recent rebound of the yield of Canadian government bonds, as well as the potential reasons of higher yields: the strength of the US economy and the optimism of recent employment reports.

While most of the reasons quoted in this report will appear well known to economists, the value of the system lies in the automatic and systematic analysis it represents of hundreds of thousands of documents, which can be run on demand or daily to provide an early warning of new contrarian opinions on such macro-economic topics.

# Benefits and Applications

The Contrarian Analysis Agent offers a suite of advantages that can significantly enhance financial decision-making processes. At its core, this approach provides a more balanced perspective on financial narratives by systematically identifying and articulating the latest minority viewpoints. This balanced view is crucial in today's complex financial landscape, where overlooking alternative perspectives can lead to missed opportunities or unforeseen risks.

One of the key strengths of this methodology lies in its ability to highlight potential risks or challenges that may be underappreciated in mainstream analyses. By surfacing the most recent contrarian viewpoints, it acts as an early warning system, allowing analysts and investors to consider a broader range of potential outcomes and prepare accordingly.

Moreover, the Contrarian Analysis Agent serves as a powerful tool for mitigating cognitive biases such as confirmation bias and groupthink. In an industry where these biases can lead to costly mistakes, the systematic presentation of alternative perspectives encourages more thorough and critical evaluation of financial data and market trends.

The computational efficiency of this automated approach must be highlighted: each analysis takes less than 30s leveraging a corpus of over 150 million texts. In a world where the volume of financial data is ever-increasing, the ability to rapidly and consistently evaluate large amounts of information for contrarian viewpoints is invaluable. This efficiency allows analysts to focus their expertise on interpreting and acting upon the insights generated, rather than spending countless hours manually sifting through data.

The applications of this Contrarian Analysis Agent span various sectors of the financial industry. In investment management, it can inform more robust and well-rounded investment strategies by ensuring

that alternative viewpoints are considered. For corporate strategy, it serves as a tool to identify potential blind spots, enabling more comprehensive and resilient strategic planning. In risk management, contrarian insights can enhance risk assessment processes, helping to uncover hidden vulnerabilities. Even in regulatory compliance, this approach can assist in developing more comprehensive disclosure practices by ensuring that a full spectrum of perspectives is considered and addressed.

## Challenges and Limitations

While the Contrarian Analysis Agent presents significant advantages, it's important to acknowledge and understand its challenges and limitations. The effectiveness of the analysis is intrinsically tied to the quality and comprehensiveness of the input data. In financial markets, where information can be incomplete, biased, or rapidly changing, ensuring consistently high-quality data input remains an ongoing challenge.

Context sensitivity presents another hurdle. Contrarian viewpoints, while valuable, may sometimes be outliers for valid reasons. The system must be finely tuned to distinguish between genuinely insightful contrarian perspectives and those that may be misleading or irrelevant. This requires a delicate balance and often necessitates human oversight to interpret the results in the appropriate context.

The reliance on Large Language Models (LLMs) for analysis introduces the potential for model bias. These models, despite their sophistication, may have inherent biases based on their training data and algorithms. These biases could potentially influence the generated contrarian perspectives, requiring careful validation and cross-checking of the outputs.

There's also a risk of overemphasizing dissent. In the pursuit of contrarian viewpoints, the system might inadvertently place too much value on differing opinions simply because they diverge from the mainstream, rather than because they offer genuine insight. Striking the right balance between highlighting valuable contrarian views and avoiding undue focus on outlier opinions is a nuanced challenge.

## Future Directions

As we continue to refine and expand the Contrarian Analysis Agent, several promising avenues for future research and development emerge. One key area of focus is the integration of quantitative data alongside textual analysis. By incorporating numerical financial data, we can create a more comprehensive framework for contrarian insights, bridging the gap between qualitative narratives and quantitative metrics.

The development of dynamic time-series analysis capabilities presents another exciting frontier. This would allow us to track how contrarian viewpoints evolve over time, potentially identifying early signals of shifts in market sentiment or emerging trends before they become mainstream. We have already explored such "novelty detection" approaches (Laudy et al., 2022), and can combine them with contrarian analysis. Such temporal analysis could provide invaluable foresight for long-term strategic planning and investment decisions.

Expanding the methodology to facilitate cross-sector comparative analysis is another area with significant potential. By drawing contrarian insights from comparisons across different sectors or industries, we can uncover hidden correlations and divergences that might not be apparent when focusing on a single sector in isolation. This broader perspective could lead to more nuanced and comprehensive financial strategies.

Looking ahead, we envision developing customizable contrarian thresholds within the system. This feature would allow users to adjust the sensitivity of what constitutes a "contrarian" viewpoint based on specific customer needs and risk tolerances. Such flexibility would make the tool more adaptable to various use cases, from conservative risk management to aggressive opportunity seeking.

As financial markets continue to evolve in complexity and interconnectedness, the future of the Contrarian Analysis Agent lies in its ability to adapt and provide ever more sophisticated and contextually relevant insights. By pursuing these directions, we aim to create a tool that not only identifies contrarian viewpoints but also helps in understanding their implications and potential impacts across the financial landscape.

## Conclusion

The Contrarian Analysis Agent, built upon the robust foundation of SRAG, represents a significant advancement in financial analysis tools. By systematically uncovering and articulating minority viewpoints, this approach offers a more nuanced, comprehensive understanding of financial narratives.

As demonstrated through our case study and discussion of benefits, this methodology has the potential to enhance decision-making processes across various facets of the financial industry. It serves not only as a tool for identifying potential risks and opportunities but also as a safeguard against the dangers of echo chambers and groupthink in financial analysis.

While challenges remain, the future directions outlined suggest a path toward even more sophisticated and insightful contrarian analyses. As financial markets continue to evolve in complexity and speed, tools like the Contrarian Analysis Agent will become increasingly vital in maintaining a well-rounded, critical perspective on financial information.

In an era where the ability to identify and understand diverse viewpoints can make the difference between success and failure in financial endeavors, the Contrarian Analysis Agent stands as a powerful ally for analysts, investors, and decision-makers alike.

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