

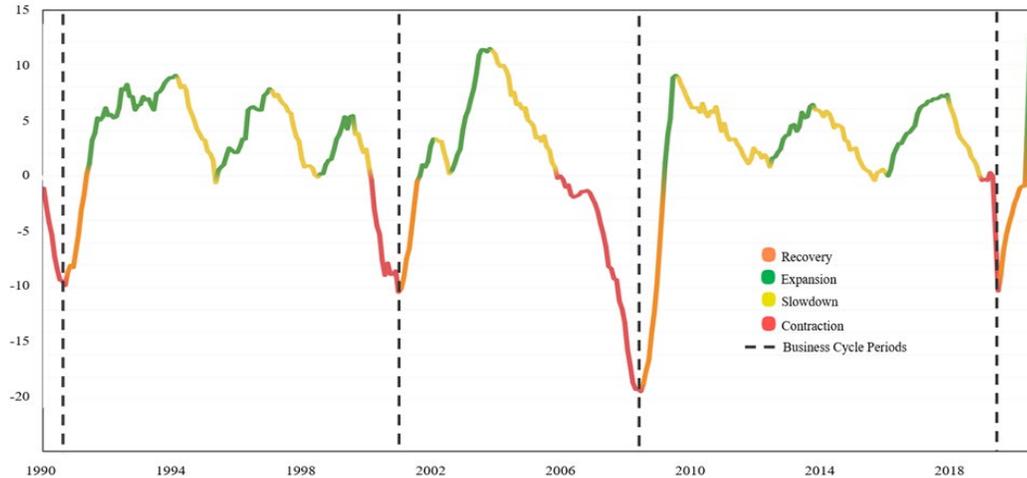
Portfolio Optimization Using the Business Cycle Approach

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Abstract

The purpose of the study is to investigate whether a portfolio manager could enhance his/her portfolio optimization strategy by periodically adjusting the equity sector weights to a diversified stock portfolio. The business cycle approach focuses on providing a framework for adjusting sector weightings to take advantage of recurring trends in economic growth that signal a phase transition soon. Once a shift in stages is detected, investors are advised to adjust their portfolio to overweight a specific sector that is projected to outperform in the next phase of the cycle and to offset exposure in sectors that tend to underperform during the same period. To optimize portfolio returns with minimal risk, the business cycle approach must align with macro-fundamental analysis metrics to identify unique variables in each sector that can significantly impact its performance. This study proposes using the Conference Board Leading Economic Indicator (LEI) to reformat the initial business cycle framework created by Burns and Mitchell (1946) and evaluate the performance of S&P 500 sector indices since 1993..

Business Cycle Measurement: Conference Board's Leading Economic Index (LEI)



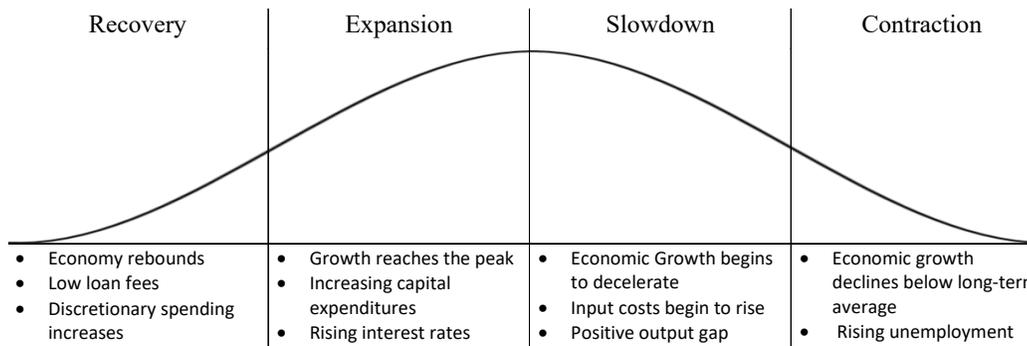
Sharpe Ratio

	RECOVERY	EXPANSION	SLOWDOWN	CONTRACTION
Materials	0.49	0.05	-0.22	-0.10
Industrials	0.33	0.16	-0.10	-0.14
Energy	0.03	0.07	-0.14	-0.03
Financials	0.43	0.11	-0.03	-0.03
Consumer Discretionary	0.45	0.13	-0.03	-0.03
Consumer Staples	-0.19	-0.18	0.01	0.01
Health Care	-0.41	0.04	0.07	0.07
Information Technology	0.32	0.38	0.02	0.02
Real estate	0.35	0.01	0.11	0.11
Utilities	-0.53	-0.24	0.02	0.02
Telecommunications Services	-0.60	-0.15	-0.06	-0.06

Research Questions

- Which sectors have outperformed and underperformed the benchmark index during each four phases of the cycle?
- How often does an individual sector index outperform the overall market during each four phases of the cycle?
- Is the Leading Economic Index (LEI) an efficient forecasting tool for active portfolio managers?

Results



Limitations

My study concludes that using a disciplined business cycle approach can help identify which areas of the market to offset risk before the cycle transition occurs. However, my study cannot consider the variations in economic fluctuations that may occur in the short term. For example, the four phases of the business cycle are determined by a hidden pattern of money flows, but this pattern is often disrupted by external shocks, such as epidemics, catastrophic events, international events, and neighboring events. It's important to note that the telecommunication sector has undergone various classification revisions over the past decade, which may have impacted the sector's performance throughout my study.

Analysis Metrics

- Average Monthly Performance = $(P(t+1) - P(t)) / P(t)$
- Full Period Average Performance = $(R(\text{benchmark}) - R(\text{sector}))$
- σ = Average Standard Deviation of Monthly Sector Returns
- Correlation Coefficient = $\text{CORREL}(\text{Sector Returns}, \text{Benchmark Returns})$

References

- Burns, A. F., & Mitchell, W. C. (1946). Measuring business cycles. NBER Books.
- Dzikevičius, A., & Vetrov, J. (2012). Investment portfolio management using the business cycle approach. *Journal of Business Finance & Accounting*, 39(1), 1-15.
- Moore, G.H. (1961). Leading and Confirming Indicators of General Business Changes. In G. Business Cycle Indicators, vol 1, (p. 45-109). Princeton: Princeton University Press for NBER.
- Bloomberg, as of 14th March 2022

<ul style="list-style-type: none"> ++ Consumer Discretionary ++ Materials ++ Financials ++ Real Estate 	<ul style="list-style-type: none"> ++ Information Technology ++ Consumer Discretionary ++ Industrials ++ Financials 	<ul style="list-style-type: none"> ++ Health Care ++ Consumer Staples ++ Utilities + Real Estate 	<ul style="list-style-type: none"> ++ Consumer Staples ++ Health Care + Materials
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