

Summary of Some Methods on Phase Identification

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	Market	Number and Phases	Indicators and Data	Methods
Vliet and Blitz (2011)	U.S. (1948-2007)	Four: Expansion, Peak (slowdown), Recession, Recovery.	1. U.S. Credit Spread (Baa-Aaa); 2. ISM factor (ISM manufacturers' survey production index); 3. U.S. Unemployment rate; 4. Earning yield (E/P ratio of S&P500).	E.g. Expansion is defined as that the combination of 4 economic indicators is both positive and rising. (See appendix of the paper for the way of combination.)
<i>Hodges et al. (2017)</i>	<i>U.S. (1988-2016)</i>	<i>Four: Expansion, slowdown, Recession, Recovery.</i>	<i>1. Citi U.S. Leading Indicator for Consensus Economic Forecasts and forecasts from Consensus Economics; 2. Chicago Fed National Activity Index.</i>	<i>1. Acceleration is defined as increases in growth in excess of one standard deviation; 2. Probability of recession is the likelihood of a recession in the subsequent period by regressing the three-month-ahead coincident economic indicator on the current level. E.g. Expansion is defined with low probability of recession and acceleration.</i>
Scherer and Apel (2020)	U.S. (2002-2018) ¹	Four: Expansion, Peak (slowdown), Recession, Recovery.	1. U.S. unemployment rate ; 2. Producer sentiment: Markit Global Manufacturing PMI (MPMIGLMA Index) and ISM Non-Manufacturing NMI (NAPMNMI Index) ; 3. Consumer sentiment: The Conference Board Consumer Confidence Index (CONCCONF Index, PURCHASE NEEDED) and the University of	1. The approach is an enhancement of the economic model developed by Vliet and Blitz (2011) as the methodology is intuitive, robust, and easily applicable. 2. Aggregated Z-scores calculated from different series. E.g. Expansion: Z-score positive and increasing.

¹ Scherer and Apel (2020) use monthly data from March 1998 as they represent the longest available common data history of the used macroeconomic variables.

			Michigan Consumer Sentiment Index (CONSSSENT Index); 4. Financial market stress : Kansas City Financial Stress Index (KCFSINDX Index) 5. Economic growth: OECD CLI Index	
Arnott et al. (2017)	U.S. (1880-2016) and other developed countries	25 phases: 5 Regimes for Inflation * 5 Regimes for Real Rate	1. U.S. inflation rate; 2. U.S. real rate.	1. Classify inflation into 5 regimes based on quantiles; 2. Classify real rate into 5 regimes based on quantiles; 3. Create 5*5 regimes.

Data Source:

The Conference Board Consumer Confidence Index (**Subscription NEEDED**): <https://conference-board.org/data/consumerdata.cfm>

Kansas City Financial Stress Index (KCFSINDX Index): <https://fred.stlouisfed.org/series/KCFSI>

Michigan Consumer Sentiment Index: <https://data.sca.isr.umich.edu/data-archive/mine.php>

OECD CLI Index: <https://data.oecd.org/leadind/composite-leading-indicator-cli.htm>

Reference

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