U.S. Equity Strategy

Optimal Sector Allocation Across the Business Cycle

MACRO STRATEGY

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Despite the length of the current expansion cycle (9+ years) we believe that there is no imminent threat of recession and that we are only now entering the late stages of the expansion. Current macro indicators, debt and capex levels, as well as our in-house industry-specific views, point to little threat of a recession in the near term. To properly position for the late expansion we create optimal baskets for each stage of the cycle expansion/recession using 90+ years of data. Our optimized late-expansion basket is long Staples and Health Care, but short Consumer Discretionary and Utilities, and has been outperforming in recent months.

- **No sign of imminent recession as we enter the late expansion stage.** Although the current expansion is the second longest since 1921, there are very few signs of trouble on the horizon. Most leading recession indicators such as the 10y-3m Treasury yield spread, the Conference Board LEI, and current level of the GDP output gap indicate that at worst we are just entering the late expansion stage. While current levels of SPX debt are high they are easily serviceable, and capital expenditures show no sign of exuberance. Additionally, two of the primary causes of the financial crisis (Financials' Debt and Household Debt) remain well below pre-crisis highs. Lastly, a detailed analysis of our analysts' industry research indicates no concerns of any of the industry-specific cycles coming to an end.

- **To properly position for current environment we create optimized baskets for each stage of the business cycle.** We analyze 90+ years of data spanning 16 business cycles to create of long-term view of market behavior during different cycle stages, as opposed to looking at only the prior 2-3 cycles. Using this data we divided the cycles into five stages (three expansion stages, two recession stages) and construct risk optimized baskets for each stage. Additionally, to prevent poor returns from stage misidentification, we constrain these baskets to not underperform in the adjacent stages (e.g., the late expansion basket must not underperform in the early recession stage).

- **The optimal basket for late expansion is long Staples & Health Care and short Discretionary & Utilities.** Our optimal late expansion long/short basket has outperformed in each late expansion stage, with performances of 0.2% (1987), 6.3% (1997), and 3.1% (2005) in the last three late expansion periods. Lastly, the optimal late expansion basket has been outperforming in the prior six months while the middle expansion basket has underperformed, further indicating that we are beginning to shift from the middle expansion to late expansion stage.

Where Are We in the Business Cycle?

As we move into the late-expansion phase, near-term growth is not slowing down…

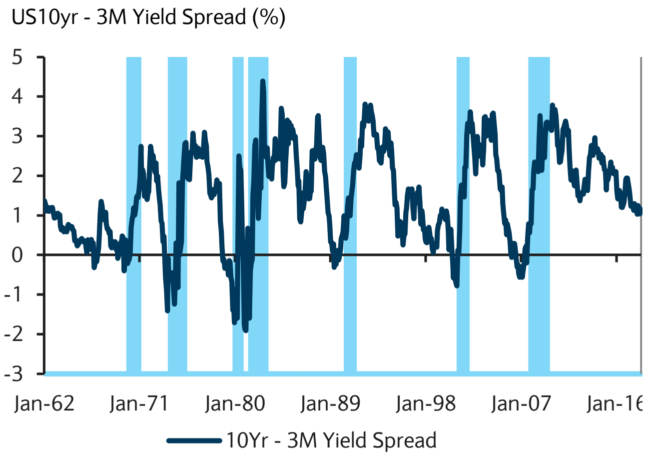
One key concern voiced by some investors is that the current U.S. expansion, now approaching nine years (second longest expansion since 1921), is already too long in the tooth. However, our analysis of three different recession indicators (macro indicators, aggregate SPX fundamental levels, and industry-specific cycles) suggests that the risk of a growth slowdown in the short term appears quite low.

Macro Indicators Show No Sign of Imminent Recession

The term structure (typically defined as the difference between 10-year Treasury yields and 3-month rates) has historically been one of the most reliable indicators which portend an imminent recession. Figure 1 demonstrates this by plotting this metric versus the National Bureau of Economic Research (NBER) defined recession periods and we see that it typically turns negative prior to a recession.

FIGURE 1

A negative 10y-3m yield spread would indicate a high likelihood of a near-term recession …

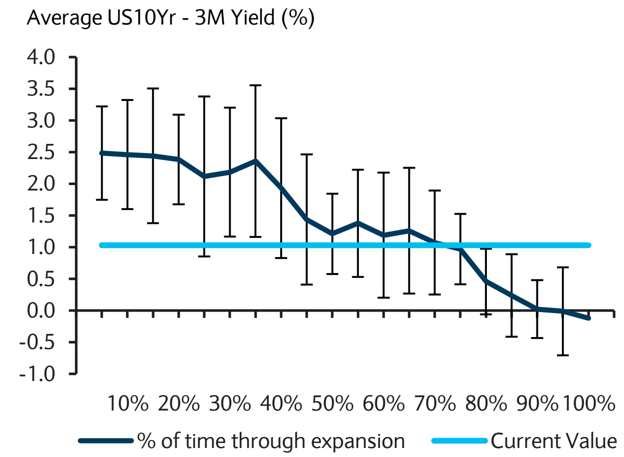


Source: Barclays Research, Bloomberg

Note: Blue shaded areas show NBER defined recessions.

FIGURE 2

…but the spread is currently positive and on par with levels seen when expansion is 75% complete



Source: Barclays Research, Bloomberg

Note: Data is from 1/1962 to 4/2018. Expansion cycle time is calculated by subdividing each expansion into 20 quantiles. Average yield spread is then calculated as the average monthly value within each of these quantiles across all expansions. Error bars show standard deviation for each bucket. Current value is as of 6/6/2018.

…and a recession does NOT seem imminent

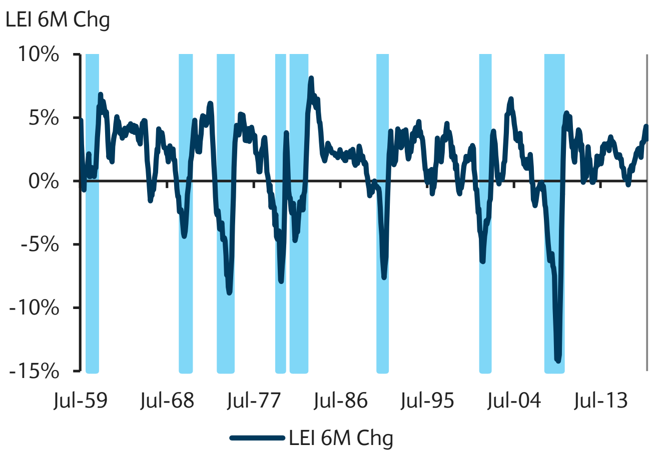
Although this metric has indeed been flattening since the start of this year, we are still some distance from the "danger zone." There are several ways to quantify this intuition. One possibility is to translate the level of the yield curve into a probability of recession using a Probit model, which is the method employed by the NY Fed Probability of Recession Index (see "*Global Volatility Outlook 2018: Carry On for Now*," 13 December 2017) which is currently at 11.2%.

It is also instructive to adopt a more intuitive approach. In Figure 2 we plot the average value of the term structure as a function of the "expansion cycle time." Since historically the expansion cycles have not been of equal length, we first normalize the time span of each expansion from 0 to 1. Said differently, the cycle time simply measures how far we are in an expansion. We then calculate the average and standard deviation of the term structure as a function of this cycle time. Figure 2 quantifies the notion that we are still a distance from the tipping point. Indeed, while the Fed commented about this flattening in the latest FOMC minutes, they cited several technical reasons why this might be happening, indicating that they are not overly concerned about its level.

Figure 3 does a similar exercise for the six-month growth in the LEI (Leading Economic Index) calculated by the Conference Board. This is a composite indicator of 10 macro variables (including the term structure) which have worked well in providing early signs of a growth slowdown (see *www.conference-board.org* for details). This broader measure index implies that we are even further from an actual recession.

FIGURE 3

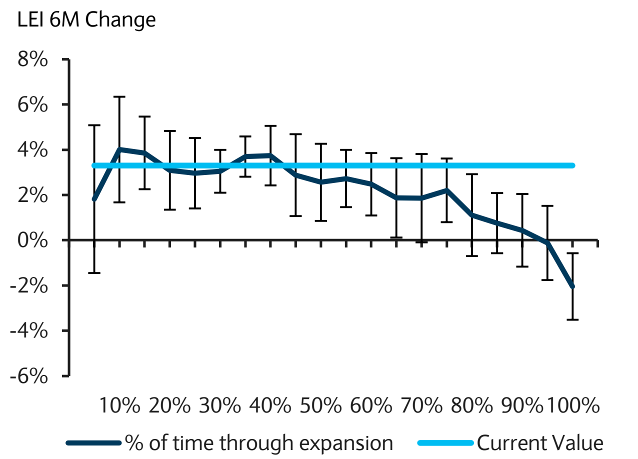
LEI typically begins to contract before entering a recession



Source: Barclays Research, Bloomberg.
LEI - The Conference Board Leading Economic Index
Note: Blue shaded areas show NBER defined recessions.

FIGURE 4

The LEI has been exceptionally strong recently, with values usually associated with the mid-expansion period

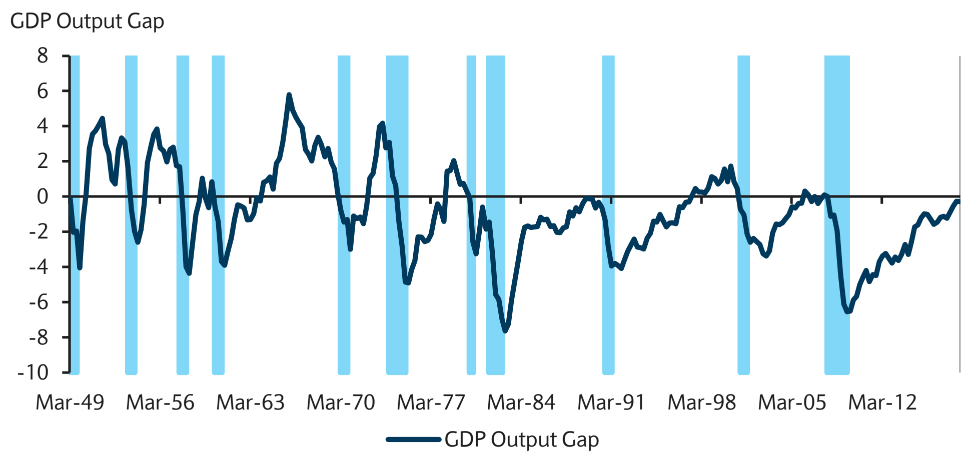


Source: Barclays Research, Bloomberg. Data is from 7/1959 to 4/2018. Expansion cycle time is calculated by subdividing each expansion into 20 quantiles. Average LEI 6M Change is then calculated as the average monthly value within each of these quantiles across all expansions. Error bars show standard deviation for each bucket. Current value as of 6/6/2018.

We also note that while the current expansion has been *long*, it has not been particularly *strong*.

FIGURE 5

The GDP output gap has just closed



Source: Barclays Research, Bloomberg. Data is from 1949 to 2017. Last observed GDP output gap data is from 3/31/18. GDP output gap is defined as the difference between actual GDP and potential GDP. Shaded areas show NBER recessions.

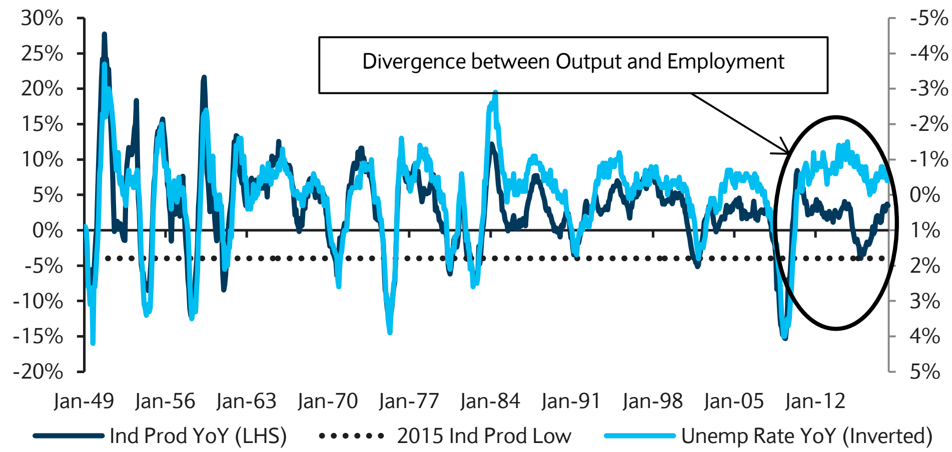
Thus the output gap (the difference between actual and potential GDP) has only recently closed (Figure 5). Prior to this, the U.S. economy was not operating at full capacity. As can be seen from Figure 5, historically recessions have not happened when the output gap is negative. During the 1991 and 2008 recessions, although the output gap never became positive, the recessions took some time to materialize.

The mini industrial recession 2-3 years ago may have released some pressure

We also note that as shown in Figure 6, we already had a mini industrial recession in 2015-16. Thus the magnitude of the drop in industrial production was at par with previous recessions. This did not qualify as a full recession primarily because it was not accompanied by a corresponding drop in the labor market. Still, any incipient excess in the economy was probably partially vented during this time.

FIGURE 6

The mini industrial recession in 2015 may have released some pressure from the current expansion



Source: Barclays Research, Bloomberg. Note: Last observed Data is from 3/31/2018

Aggregate SPX Fundamentals Show Little Sign of Over-exuberance

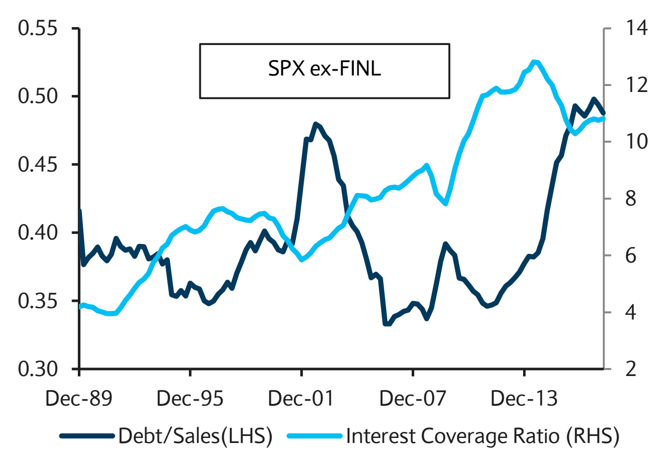
Debt and capex levels are not flashing warning signs at present

We note that the business cycle is predicated on a cycle of greed and fear. Thus, as an expansion proceeds, businesses assume that it is "different this time" and extrapolate the good times into the indefinite future. This results in overcapacity, which is typically financed with higher debt. As a result, when demand does not meet the lofty expectations, this initiates a negative feedback loop, ultimately causing a recession.

However, despite the length of the current cycle, we don't see any warnings signs coming from either debt levels or capital expenditures in the S&P 500. While current SPX ex-FINL Debt/Sales levels have climbed to prior highs seen in 2001, the ability to service that debt (Interest Coverage Ratio) has been strengthening. This is because not only is the absolute level of rates low but margins are also quite high, leading to higher cash flow. Additionally, two of the primary catalysts of the credit crisis (Household and Financials' Debt) have declined dramatically as a % of GDP/Sales.

FIGURE 7

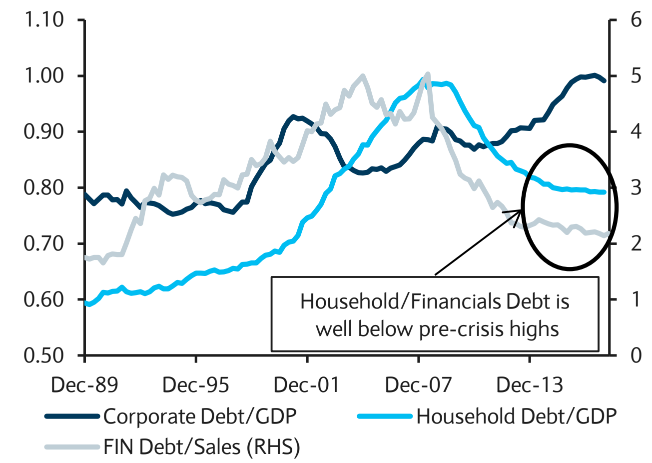
While SPX debt levels have been climbing, the ability to service that debt remains strong



Source: Barclays Research, Thomson Reuters. All Ratios are using LTM data. Interest Coverage Ratio is defined as LTM EBITDA divided by LTM Interest Paid.

FIGURE 8

After reaching peak levels during the credit crisis, Household and Financials' Debt has declined significantly

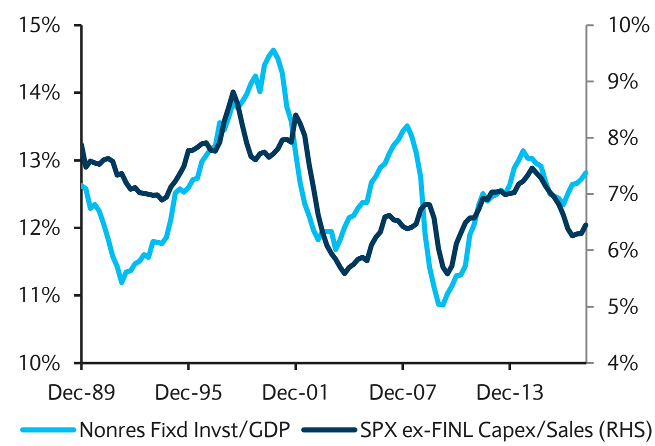


Source: Barclays Research, Haver Analytics, Thomson Reuters
Note: SPX Financials Debt is calculated as Debt/LTM Sales.

Additionally, current levels of both SPX ex-FINL Capex/Sales and Corporate Capex/GDP are well below historical highs seen during the late 1990s and have trended down in the past few years. Further, while capex levels have been declining, capital returns to investors have been on the rise (Figure 10) especially via stock buy-backs. Clearly, there is little sign of over-exuberance within SPX investment levels.

FIGURE 9

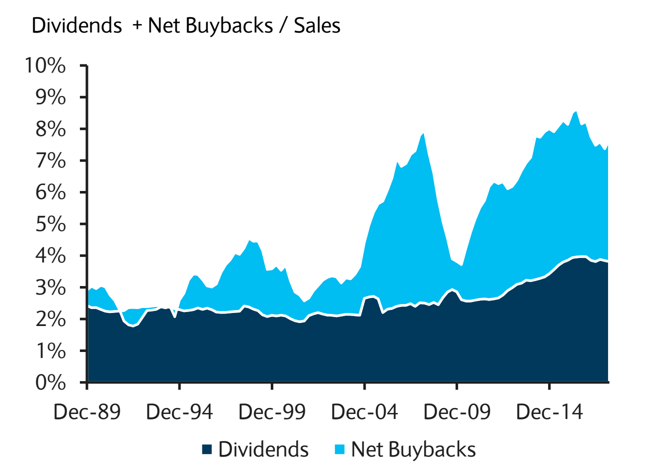
Both SPX and Corporate Capex levels are below historical highs and have trended down since 2014 ….



Source: Barclays Research, Thomson Reuters, Haver Analytics
Note: SPX Ratios use LTM Data.

FIGURE 10

… while capital returned to investors is near all-time highs



Source: Barclays Research, Thomson Reuters, Haver Analytics
Note: SPX Ratios use LTM Data.

Industry-Specific Cycles Show Positive Demand Growth and Capital Discipline

The above discussion has focused on the business cycle for the entire economy. However, different industries also face their own industry-specific cycles, which may or may not be synchronized with the broader business cycle. Our deep dive into different industry-specific cycles indicates that while most industries are experiencing positive demand growth, company managements are exercising capital and supply discipline along with self-help initiatives to drive sales and earnings growth. Importantly, we do not see any signs of excess or an imminent risk of a recession from the industry-specific cycles.

Industrials

- **Short vs. Long Cycle:** While late economic cycle implies limited short-cycle growth upside, it is partially offset by a long-cycle recovery that continues unabated
- **Aerospace Cycle:** Unprecedented seven-year aircraft backlog implies years of strong commercial aerospace growth
- **Rail & Road Cycle:** Capacity tightness in trucking/rail should keep transportation price inflation intact

Consumer Discretionary

- **Housing Market Cycle:** Strong housing market due to pent-up demand from years of underinvestment and millennials becoming homeowners
- **Inflation Cycle:** Tightness in labor market and trucking/rail capacity keep wage and freight price inflation high

Consumer Staples

- **Rate Cycle:** Limited downside from higher rates as the bond-proxy trade has largely unwound
- **Inflation Cycle:** Tightness in labor market and trucking/rail capacity keep wage and freight price inflation high

Energy

- **Oil Cycle:** Over the short term, oil prices remain elevated due to supply disruption from Venezuela and Iran, and OPEC countries exceeding target output cuts. Over the medium term, the equilibrium oil price has shifted lower due to shale revolution. Run-up in oil prices and shift in capex from expensive acreage acquisitions to proven reserves development could lead to higher ROICs for the industry. At the same time, companies are exercising capital discipline and have started returning cash to shareholders rather than investing all of it in growth capex.

Financials

- **Monetary Cycle:** Higher rates lead to interest income growth despite flat yield curve due to high net asset sensitivity (strong deposit demand has kept deposit sensitivity low)
- **Credit Cycle:** Benign asset quality with loan losses at 60% below historical averages
- **Capital Allocation:** Buybacks/dividends should continue due to high capital levels despite tougher CCAR requirements
- **P&C Pricing Cycle**: P&C insurance premiums have stabilized after five years of downward trend as a result of last year's catastrophic losses due to hurricanes, despite high influx of alternative capital from pension/hedge funds

Utilities

- **Rate Cycle:** Higher interest rates will hurt already full valuations
- **Capital Allocation:** Investment as a result of **pipeline replacement cycle** driving rate-base growth could be a positive

Information Technology

- **Enterprise IT Cycle:** Late stages of economic cycle favorable for enterprise IT hardware/software spending as healthy profit levels incentivize often pushed-out hardware/software upgrades

- **Smartphone Cycle:** Apple relying on its loyal user-base to drive higher ASPs through software-differentiated hardware and high growth services revenue of app store as smart-phone market matures

- **Wireless Cycle:** High price competition, proliferation of unlimited plans, and maturing smartphone market point to dim prospects for wireless revenue growth. Wireless providers are responding by either moving toward vertical integration to offer content-based bundles or deploying fixed wireless services using 5G to compete against cable distributors

Materials

- **Chemicals Cycle:** Improving chemical margins as a result of increasing demand forecasts, capacity rationalization due to industry consolidation and limited global supply additions as producers exercise capital discipline

Healthcare

- **Drug Patent Cycle:** Large-cap biotech/Pharma are facing significant patent cliffs leading to competition from generics. However as in the past they are responding by acquiring new gene/cell-based therapies and other potentially blockbuster drugs prior to commercialization leading to asymmetric return potential. Repatriation of international cash provides additional firepower to do this.

Hence, based on the analysis so far, it appears that at best we are in the early part of the late-expansion stage. In the next section, we discuss how investors can optimally position their baskets under this assumption.

Constructing Business Cycle Optimized Baskets

We look at performance over 16 business cycles rather than the usual 2-3…

In this section we construct baskets optimized to work well during different stages of a business cycle by allocating to different sectors. Investors usually apply several simple rules of thumb (e.g., Utilities outperform during recessions; Discretionary outperforms in expansions) to determine which sectors/industries would do well across the business cycle; however, many of these rules are based on performance over the past few decades. Since such an analysis only covers 2-3 business cycles, the results are unlikely to be robust. Indeed academic work has shown that several of these rules do not withstand empirical scrutiny (see, for example, *Sector rotation over business-cycles, Stangl, Jacobsen, Visaltanachoti, 2009)*.

…And like the enhanced robustness of this approach

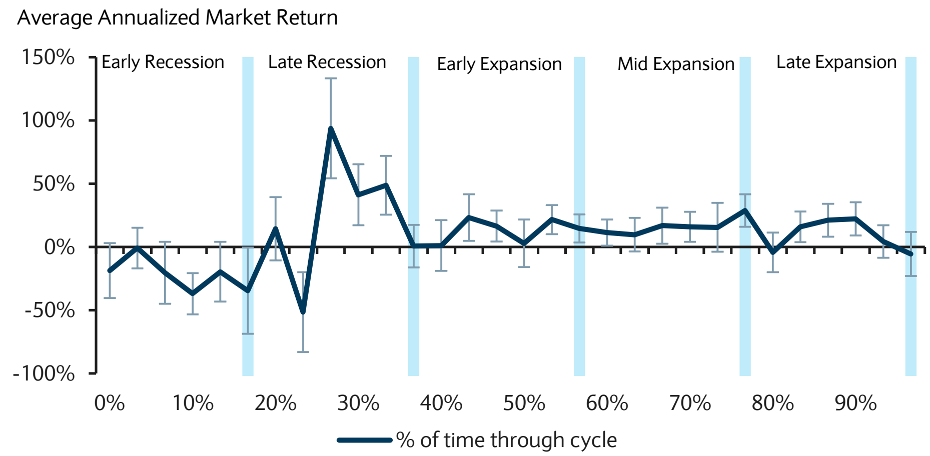
We take a long-term view by using data starting from 1926 which encompasses 16 business cycles. One key drawback is of course that the economy and equity market have evolved considerably over this time and so the lessons learned might not be relevant today. However, we will see that our results are fairly consistent over time, giving us confidence that this trade-off between robustness and relevance is worth doing.

Market Performance Across the Stages of the Business Cycle

In order to more precisely examine the evolution of equity returns across the business cycles we divide the NBER expansion phases into three phases which we label as Early Expansion, Middle Expansion, and Late Expansion. Similarly, we divide the NBER recession time periods into two stages, which we label as Early Recession and Late Recession.

FIGURE 11

Market returns have been both strongly positive and strongly negative during the late recession phase



Source: Barclays Research, Ken French data

Note: Recessions are subdivided into 10 quantiles, while expansions are subdivided into 20 quantiles. Data is from 1926 – 2009. Error bars represent +/- 1 standard deviation. Past performance is not a guarantee of future results.

Figure 11 shows the average and standard deviation of market returns for each stage of the business cycle since 1926 and Figure 12 provides more granular details. We see that on average, market returns are negative in the early recession stage, bounce strongly in the late recession stage, and while they are positive during the expansion stages their magnitude slowly declines. However, the standard deviation of returns in the late recession period (28%) is much higher than any expansion phase (14%, 11%, and 13%, respectively) indicating a stronger likelihood of negative returns. Digging deeper, we see that returns are fairly stable in all stages except late recession, which has both the highest positive and negative returns during the cycle.

FIGURE 12

Market returns are consistently negative during the early recession phase, but are positive on average otherwise

Market Returns							
Cycle	Cycle Recession Start	Early Recession	Late Recession	Early Expansion	Middle Expansion	Late Expansion
1	7/1926					10%
2	11/1926	20%	30%	18%	44%	28%
3	9/1929	-39%	-22%	38%	31%	16%
4	6/1937	-53%	12%	4%	2%	23%
5	3/1945	15%	37%	-3%	7%	1%
6	12/1948	7%	23%	29%	9%	10%
7	8/1953	9%	45%	36%	20%	-2%
8	9/1957	-33%	31%	43%	16%	-10%
9	5/1960	2%	49%	9%	6%	10%
10	1/1970	-49%	30%	13%	24%	-22%
11	12/1973	-28%	18%	19%	7%	15%
12	1/1980	-26%	66%	30%	16%	12%
13	7/1981	-18%	36%	17%	11%	21%
14	7/1990	-53%	65%	10%	24%	12%
15	3/2001	4%	-17%	3%	12%	12%
16	12/2007	-14%	-26%			
Average		-17%	25%	19%	16%	9%
Median		-18%	30%	17%	14%	12%
Standard Deviation		25%	28%	14%	11%	13%

Source: Barclays Research, Ken French data

Note: Market returns are from the Ken French database and represent market-value weighted returns of all CRSP firms incorporated in the US and listed on the NYSE, AMEX, or NASDAQ with good share, price, and return data. Returns are annualized average daily returns. Past performance is not a guarantee of future results.

Industry Performance across Different Stages of the Business Cycle

To get a comprehensive account of industry performance over time we use the industry definitions and returns from the Ken French database, with history from 1926 to current. While this database does provide us with the longest available return history, there are two potential issues with its use:

1) The behavior of industries in 1926 can be very different compared to the current time given the change in the economic landscape. For example, what was once a cyclical industry could now be a defensive and vice versa.

2) The industry definitions are based on SIC (Standard Industrial Classification – a system for classifying industries used by government agencies) and hence do not necessarily align with the more standard GICS (Global Industry Classification Standard) or Russell classifications.

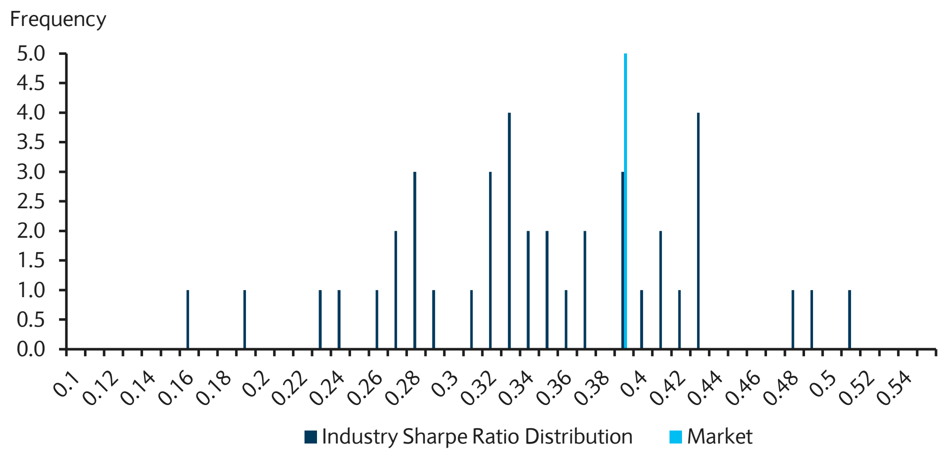
We believe that these issues require addressing, but are not particularly impactful. As we will show later, our results for optimally positioning for different cycle stages are consistent across cycles; i.e., the recommended positioning for the "late expansion" phase performs just as well from 1926 to 1940 as from 1990 to the present. Additionally, because we have current SIC code and GICs sector definitions it is possible for us to map our recommended baskets to GICs sector definitions, providing easily understood GICs sector overweights and underweights during different stages of the business cycle.

Despite decent dispersion of performance, there is still a potential benefit from industry rotation

While there is a fair amount of dispersion in market performance across cycle stages, if a few industries show consistent outperformance/underperformance, industry rotation may not even be necessary. However, looking at the distribution of Sharpe Ratios from 1926 to 2009 (Figure 13) shows that while some industries clearly are strong outperformers/underperformers, the dispersion of performance isn't high enough to rule out potential benefits from industry rotation. In fact, going equally long/short the top/bottom 10% of industries only produces an Information Ratio of 0.37.

FIGURE 13

While there is a fair amount of dispersion in industry performance, it is not high enough to rule out potential benefits from industry rotation



Source: Barclays Research, Ken French data

Note: Data is from 1926 to 2009 and only includes industries with data over the entire time period (40 total).

Finally, there needs to be differences in industry performance across the stages of the business cycle to make a business cycle–based industry rotation strategy worthwhile. A quick glance of the top industry performers in each cycle stage (Figure 14) shows that there is indeed a strong dependence of performance on cycle stages.

In particular Telecoms, Tobacco (Smoke), Food, and Utilities all show classic defensive style, with strong performance in the early recession stage, with relatively weak performance in the expansion stages. In contrast, more traditionally cyclical industries (Machinery, Autos, Electrical Equipment, and Financials) show the opposite, with stronger returns in expansion stages and weaker returns during recession stages. It should be noted that defensives show much stronger relative performance during recessions than cyclicals show during expansions.

FIGURE 14

There is a fair amount of dispersion of industry performance (Information Ratio) across the cycle stages

Top 4 Industries in Each Cycle Stage

Cycle Stage	Industry	Early Recession	Late Recession	Early Expansion	Middle Expansion	Late Expansion
Early Recession	Smoke	1.4	0.5	-0.4	-0.1	0.3
	Util	1.2	-0.4	-0.3	-0.2	0.0
	Food	1.2	0.8	-0.4	-0.3	-0.1
	Telcm	1.1	-0.4	-0.3	-0.4	0.0
Late Recession	Rtail	0.2	0.9	0.2	-0.7	0.1
	Food	1.2	0.8	-0.4	-0.3	-0.1
	Beer	-0.1	0.7	0.0	0.1	0.3
	Boxes	0.6	0.6	0.2	0.1	-0.2
Early Expansion	Autos	-0.3	0.1	0.7	0.0	-0.3
	Chems	0.5	0.0	0.5	0.0	-0.2
	Aero	-0.2	0.6	0.5	0.5	-0.2
	Trans	-0.3	-0.3	0.5	-0.2	-0.3
Middle Expansion	Mach	-0.8	-0.1	0.0	0.8	0.1
	ElcEq	-0.3	0.0	0.1	0.5	0.6
	Fun	-0.2	-0.3	0.1	0.5	0.3
	Chips	-0.5	0.1	0.2	0.5	0.1
Late Expansion	ElcEq	-0.3	0.0	0.1	0.5	0.6
	Coal	0.1	0.0	0.0	0.0	0.5
	Hardw	0.1	0.4	-0.1	0.4	0.4
	Mines	0.1	-0.1	0.0	-0.1	0.4

Source: Barclays Research, Ken French data
Note: Data is from 1926 to 2009. Information Ratio is defined as the annualized average active return of the industry divided by the annualized standard deviation of the active return. Past performance is not a guarantee of future results.

When Positioning for the Business Cycle, It's Not Only Where You Are, but Where You're Going and Where You've Been

The simple approach is too simple

Now that we've shown that there is enough variance in industry performance across the business cycle, we can construct baskets to optimally position for each cycle stage. A simple approach would be to go long/short the industries that have the strongest positive/negative performance in each cycle stage. In fact, a simple approach that equal-weights the top and bottom four industries per cycle stages has an Information Ratio of 1.0, a significant improvement over not accounting for cycle variations (Information Ratio: 0.37). However, this could lead to significant issue of optimal baskets having strong negative returns in their adjacent stages. If the strongest/weakest industries in the late expansion stage significantly underperform/outperform in the early recession stage then a simple stage misidentification would cause strong underperformance. Additionally, this approach does not take into account risk or diversification benefits. Equally weighting four industries with high volatility and correlations provides a worse risk/return profile than having industries with strong risk-adjusted returns that are uncorrelated.

To account for potential stage misidentification as well as the volatility and correlation of industry returns, we create optimal "Stage Baskets" (dollar-neutral and long-only) by performing mean-variance optimization to maximize the Information ratio within each stage of the business cycle while ensuring the adjacent stages also have positive active returns. **For investors that have the availability to short, the dollar-neutral basket provides the strongest risk-adjusted performance. For others, the long-only basket provides optimal weighting for the best active performance relative to the market.**

These strategies, which we will refer to as the ***Cycle Optimized Strategies***, have significantly positive annualized returns (Long/Short: 4.6%, Long Only: 6.2%) and strong Information Ratios (Long/Short: 1.61, Long Only: 1.47). Additionally, the Cycle Optimized long/short basket has few cycle stages with negative active returns, displaying a relatively consistent positive performance over time.

FIGURE 15

The optimal long/short industry rotation basket has limited periods of negative returns

Optimal Long/Short Portfolio Returns						
Cycle	Cycle Start Date	Early Recession	Late Recession	Early Expansion	Middle Expansion	Late Expansion
1	7/1926					5%
2	11/1926	2%	12%	10%	12%	10%
3	9/1929	15%	10%	12%	12%	2%
4	6/1937	15%	8%	4%	4%	2%
5	3/1945	3%	8%	-2%	0%	1%
6	12/1948	5%	4%	6%	4%	0%
7	8/1953	0%	-1%	4%	7%	5%
8	9/1957	22%	3%	1%	1%	2%
9	5/1960	11%	-1%	3%	3%	6%
10	1/1970	11%	6%	6%	6%	11%
11	12/1973	6%	-2%	2%	3%	4%
12	1/1980	1%	3%	-1%	4%	1%
13	7/1981	11%	8%	1%	1%	0%
14	7/1990	32%	18%	5%	4%	6%
15	3/2001	-2%	11%	1%	1%	3%
16	12/2007	5%	8%			
Average		9%	6%	4%	4%	4%

Source: Barclays Research, Ken French data
Past performance is not a guarantee of future results.

We find that the Cycle Optimized basket significantly outperforms alternative approaches that either use a simple weighting approach for each cycle stage (Information Ratio: 1.0), do not consider individual cycle stages but still uses optimized weights (Information Ratio: 0.6), or use both simple weighting and ignore cycle stage variation (Information Ratio: 0.4).

FIGURE 16

The basket optimized for each cycle stage outperforms alternative baskets that use simple weighting approach or optimized using all cycle stages

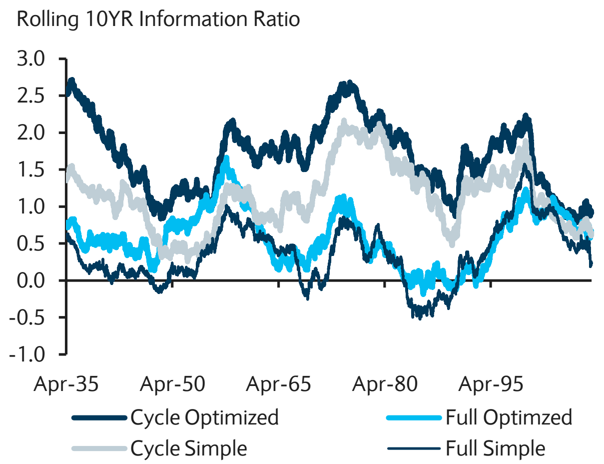
Portfolio	Cycle Optimized	Full-Period, Optimized	Cycle, Simple Top/Bottom	Full-Period, Simple Top/Bottom
Long-Only	1.47	0.71	0.88	0.42
Dollar Neutral	1.61	0.58	1.03	0.37

Source: Barclays Research, Ken French data
Note: Data is from 1926 to 2009
Past performance is not a guarantee of future results.

We also find that the Cycle Optimized baskets consistently outperform the alternative approaches over the entire period (Figure 17 and Figure 18).

FIGURE 17

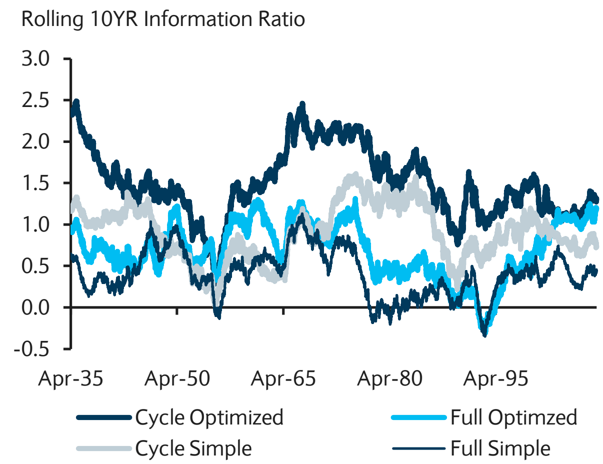
Risk-adjusted performance for the dollar-neutral baskets is consistently positive…



Source: Barclays Research, Ken French data
Note: Rolling 10Yr Information Ratios are using the trailing 2600 observed trading days. Past performance is not a guarantee of future results.

FIGURE 18

…And the same holds true for the long-only baskets

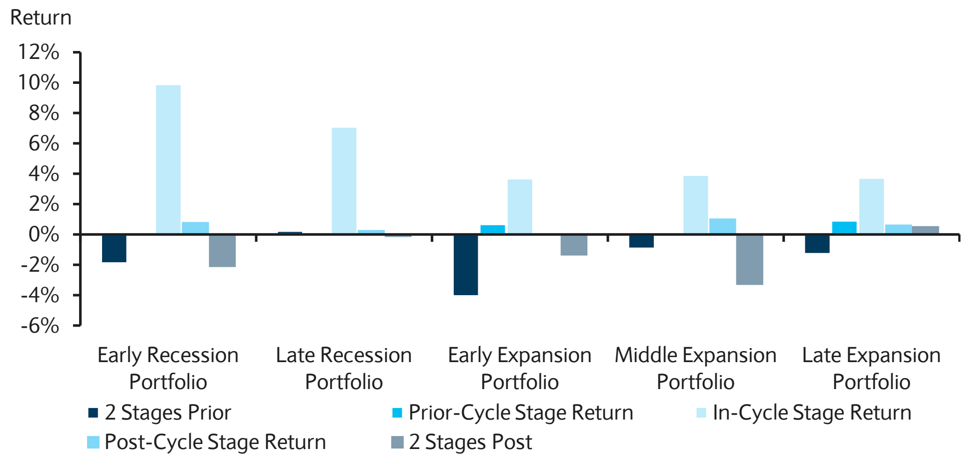


Source: Barclays Research, Ken French data
Note: Rolling 10Yr Information Ratios are using the trailing 2600 observed trading days. Past performance is not a guarantee of future results.

Lastly, we want to ensure that the constraint of having positive returns in adjacent stages of the business cycle was met for each Stage Basket. The below figure shows that while each Stage Basket has weaker performance in adjacent stages of the business cycle (i.e., the optimized "Early Recession" Stage Basket is strongest in early recession stage but weaker in other stages), the performance never turns negative. For example, the "Late Expansion" Stage Basket still has positive annualized active returns in its adjacent stages (Middle Expansion: +0.9%, Early Recession: +0.6%), but doesn't necessarily have positive active returns in stages that are further away (Early Expansion: -1.3%, Late Recession: +0.6%). This removes any worry of misidentifying the cycle stage and using the wrong optimal Stage Basket, since at worst the performance will still be positive, or in the case of the long-only optimal basket, outperform the market.

FIGURE 19

Average returns for Stage Baskets in adjacent stages are not negative, avoiding risks of stage misidentification



Source: Barclays Research, Ken French data
Note: Data is from 1926 – 2009
Past performance is not a guarantee of future results.

Some unconventional thinking on sector rotation might produce a more effective basket

Digging into the sector weightings of the optimal baskets, we find that they do not always align with conventional thinking. However, since Stangl, Jacobsen, Visaltanachoti (2009) has already shown that a sector-rotation strategy based on conventional thinking has limited efficacy, it follows that an empirically driven sector-rotation strategy may not follow conventional wisdom.

FIGURE 20

While most of the weights of the optimal Stage Baskets are consistent with conventional wisdom, there are some differences

Dollar Neutral									
Cycle Stage	**COND**	**CONS**	**ENRS**	**FINL**	**HLTH**	**INDU**	**INFT**	**MATR**	**UTIL**
Early Recession	-4%	25%	-2%	-16%	6%	-28%	2%	1%	16%
Late Recession	-5%	33%	-2%	11%	-2%	-17%	-4%	6%	-19%
Early Expansion	24%	-21%	4%	8%	-6%	-6%	-6%	14%	-11%
Middle Expansion	-24%	-13%	6%	13%	6%	17%	8%	-7%	-6%
Late Expansion	-29%	18%	10%	3%	12%	-4%	7%	-2%	-16%

Source: Barclays Research, Thomson Reuters, Ken French data
Note: Industry Rotation Long/Short optimal basket weights are mapped to GICs sectors from Ken French database's industries using current SIC Code and GICs sector mapping within the S&P 500. For simplicity, TELS is merged with INFT, while REAL is merged with FINL. Weights are scaled to a total gross of 100%.
Past performance is not a guarantee of future results.

Discretionary shows a strong negative weight in the middle-expansion phase, which is surprising given its status as a cyclical sector. We find that consistent underperformance of the Retail Industry in the middle-expansion phase (-5.0% active returns) accounts for the negative weight. Similarly, it is slightly strange that one defensive sector (Staples) has such a strong positive weight in the late-recession Stage Basket, while another defensive sector (Utilities) has the most negative weight, but we find that Utilities in general have underperformed the market during the late-recession period (-5.6% active returns).

Although we believe that the U.S. economy is in little danger of an imminent recession, current indicators still put us in the late-expansion phase of the business cycle, where the late-expansion Stage Basket would be optimal (Figure 20). This basket has a significant positive weight in Staples and Tech, as well as smaller positive weights in Health Care, Energy, and Financials. It also has significant negative weights in Discretionary and Utilities, as well as smaller negative weights in Telecom, Real Estate, Industrials, and Materials. However, it should be noted that proper sector allocation should combine the recommendations of the late-expansion basket with current sector valuations, secular trends within industries, and other pertinent information to arrive at a more robust view on sector positioning.

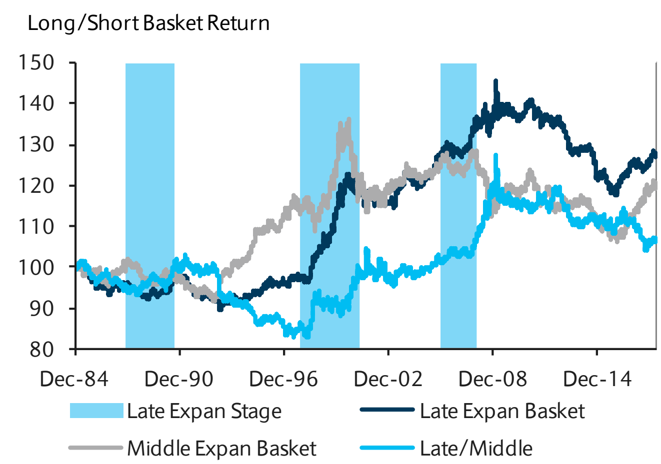
Late-Expansion Stage Basket Beginning to Outperform, Pointing to a Shift Toward Late-Cycle

Performance indicates where we are in the cycle

As previously discussed, each of our Stage Baskets outperforms strongly within their designated stage, e.g., the early/mid/late expansion basket should perform strongest in the early/mid/late expansion phase. Figure 21 shows that in each of the last three late-expansion cycle stages, the late-expansion basket has seen positive returns while also outperforming the middle-expansion basket. As expected, the late-expansion basket excels during the late-expansion stage, has moderate performance in the adjacent stages (middle expansion and early recession), but lags otherwise. Additionally, the performance of the middle expansion basket has been negative over the last six months, while the late expansion basket has continued to outperform, further indicating that we are beginning to shift from the middle-expansion to late-expansion period of this cycle.

FIGURE 21

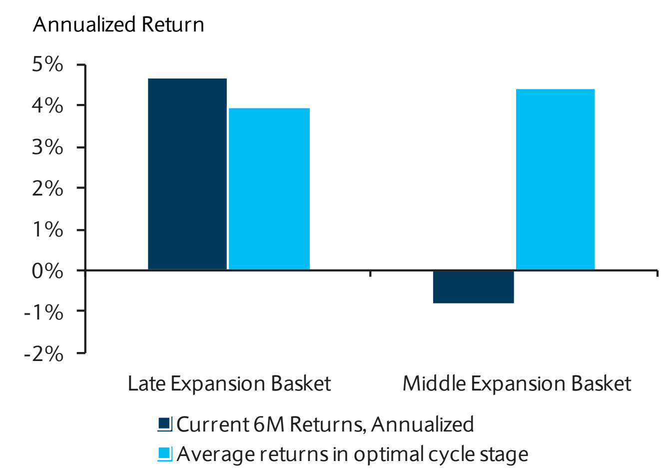
The late-expansion optimized basket has outperformed in each of the last three late-expansion stages…



Source: Barclays Research, Ken French data, Bloomberg
Data as of 4/30/2018
Past performance is not a guarantee of future results.

FIGURE 22

…and has been performing strongly over the last 6 months, especially relative to the middle-expansion basket



Source: Barclays Research, Ken French data, Bloomberg
Data as of 4/30/2018
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