Asset Performance and the Business Cycle
A US Case Study

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Introduction

Traditional theory suggests there are four stages of the business cycle: recovery, expansion, slowdown and contraction. In this paper, we provide a long-term analysis of US business cycles and their impact on sectors, smart beta factors and fixed income. We believe the lessons gleaned can help to inform asset allocation decisions.

Investment strategies to identify outperformers and laggards in different economic or market phases are well-documented in financial literature and can encompass approaches that are as diverse as price momentum and fundamental bottom-up analysis.

One of the most widely used and instinctive styles is to conduct asset allocation through information garnered from the business cycle. On the surface, this approach makes sense since business cycles exhibit characteristics that are likely to impact investment assets differently. The idea that the market functions under recurring fluctuations depending on a number of variables was formalised by Burns and Mitchell (1946).[1]

Burns and Mitchell posit that business cycles are a type of fluctuation found in the aggregate economic activity of nations that organise their work mainly in business enterprises. Moreover, they believe that a cycle consists of expansions occurring at about the same time in many economic activities, followed by similarly general recessions, contractions and revivals, which merge into the expansion phase of the next cycle.

Undeniably, each business cycle has its own particularities and no two business cycles are ever identical, even though they may bear striking resemblance to one another as the rhythm of cyclical fluctuations in the economy has tended to follow similar patterns. Performance across asset classes similarly rotates in line with different phases of the business cycle. For this reason, asset allocation with appropriate consideration to the business cycle may be invaluable as part of a longer-term investment strategy.

The Typical Phases and Characteristics of a Business Cycle

The business cycle represents the periodic fluctuations in economic activity, most notably production, trade and general economic activity. The length of a business cycle is the period of time containing a single boom and contraction in sequence. Customarily, there are four distinct phases in a business cycle: recovery, expansion, slowdown and contraction.

- **Recovery** During the recovery phase, economic growth remains below trend but rebounds sharply from the trough. Ordinarily, credit conditions have loosened and easy monetary policy leads to strong growth in profit margins.

- **Expansion** Frequently the longest phase of the business cycle, the expansionary phase enjoys a more moderate rate of growth than the recovery phase. In this part of the cycle, economic activity gathers momentum as company profitability is healthy against the backdrop of an accommodative, yet increasingly neutral, monetary policy.

- **Slowdown** A classic slowdown phase coincides with peak economic activity, signifying that growth is decelerating even though it remains positive. In this phase, the economy may start to overheat as capacity becomes more constrained, which leads to inflationary pressures.

- **Contraction** In the contractionary phase, economic activity generally falls as corporate profits decline, and the availability of credit turns scarcer, and monetary policy is also anticipated to become more accommodative.

Case Study Methodology

Defining the Business Cycle

Even though the business cycle is well understood as a concept, there is surprisingly little consensus on how it should be defined. For the purpose of the analysis in this article, we use the Conference Board's Leading Economic Index (LEI) to judge the state of economic activity in the US. It should be noted that the analysis is carried out through the use of leading indicators because they are better predictors of economic conditions over the short run. Research[2] shows that the Conference Board LEI is useful to determine the near term (i.e. 6 to 9 months) direction of aggregate economic activity.

We prefer to use leading indicators as they are better thought of as a predictor of economic conditions rather than a current barometer. Indeed, using this approach may produce results that vary from those produced by other research on this topic, for example those that use coincident indicators. However, we believe the forward-looking nature of the results provide insights not gleaned from other approaches.

Economic Cycles are Defined Based on Conference Board Leading Economic Indicators

The Conference Board LEI comprises 10 economic indicators, spanning employment and business orders to consumer expectations and financial conditions. Using a signal processing technique known as an HP-filter (see Prescott and Hodrick [1997][3] for details), we extracted the cyclical trend from monthly change of the LEI. The cyclical component was then classified into four different regimes based on simple rules related to the slope of the trend line. The four stages are as follows:

- **Recovery**   The LEI index contracts at a decelerated pace
- **Expansion**   The LEI Index expands at an accelerated pace
- **Slowdown**   The LEI index expands at a decelerated pace
- **Contraction**   The LEI contracts at an accelerated pace

Using this model, the US economy experienced roughly four major economic cycles during the analysis period, with cycle lengths spanning six to ten years. Figure 1 shows the economic regime based on our model.

Figure 1

Regimes Based on Conference Board Leading Indicator

Conference Board Leading Indicator — US (MoM change)

Legend: LEI | HP-filtered Trend | Expansion | Slowdown | Recovery | Contraction
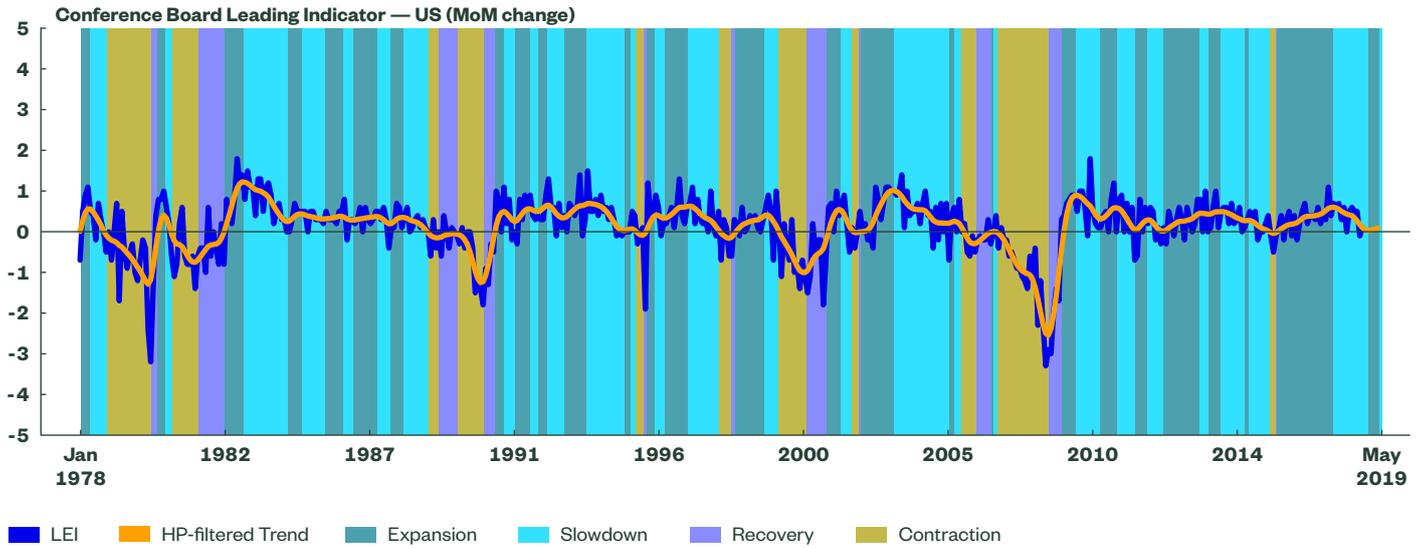
Source: Bloomberg Finance L.P., State Street Global Advisors. Monthly data from January 1978 to May 2019.

Assessing Performance of Asset Classes over Business Cycles

To understand the performance of different strategies and asset classes over time, we studied both the level of outperformance as well as its consistency on the basis of the model above. This is achieved by calculating the four metrics that are used as our evaluation criteria to assess the performance of different indices.
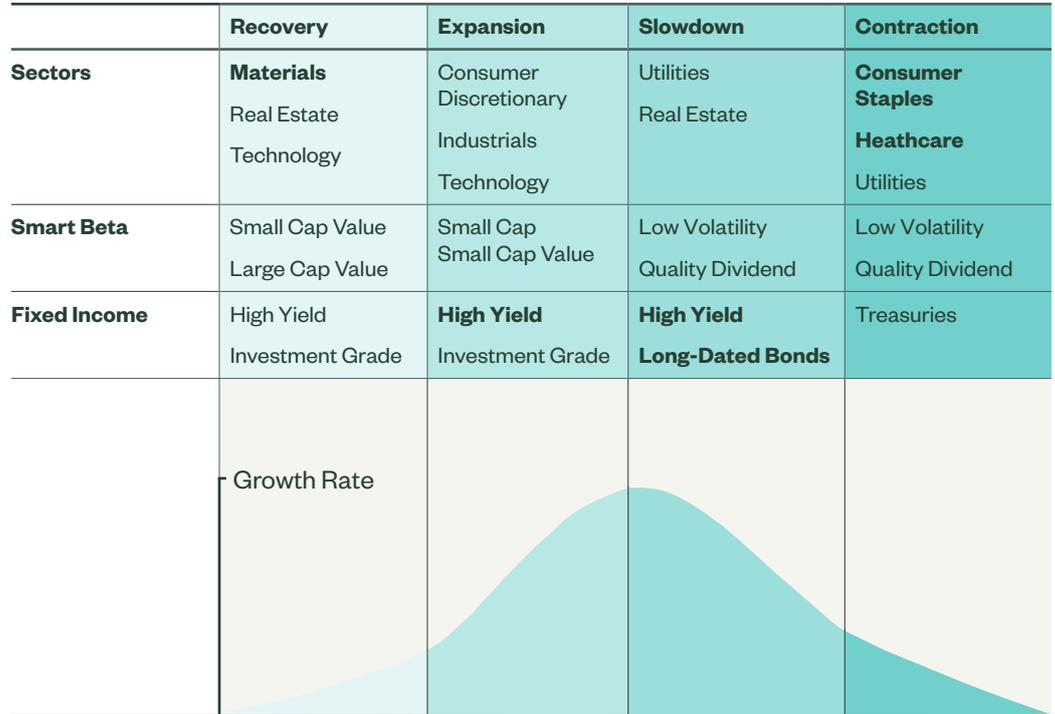
Level of Excess Return and Consistency are Both Key Criteria in Assessing Performance

Category	Metric	Rationale
Level of Outperformance	Average excess return	This measure computes the difference in the monthly performance of an asset compared to the benchmark. It **is indifferent to when a return period begins** during a phase.
	Full period average excess monthly performance	This measure calculates the average of the compounded performance of an asset class against the benchmark in a particular business cycle phase. It best captures the average performance **outcome on a "full cycle" basis, because it accounts for compounding.**
Outperformance Consistency	Average hit rate	This ratio calculates the frequency of an asset outperforming the benchmark in a given economic phase.
	Full-period hit Rate	This ratio calculates the frequency of an asset outperforming the benchmark on a full-cycle basis.

Source: State Street Global Advisors, as of 31 August 2019.

The four metrics are the principal criteria taken into consideration in the determination of an asset's performance rank. As a general rule, this means assets that score consistently well across all four categories are ranked higher than assets that do well in only a few categories. This analysis was carried out for equity sector, equity smart beta and fixed income indices. Figure 2 shows the best performing indices in each category in different business cycles, based on our evaluation criteria. In the forthcoming sections, we examine in detail the performance of sectors, smart beta and fixed income indices.

Figure 2
Best-performing Assets in Different Business Cycles

	Recovery	Expansion	Slowdown	Contraction
Sectors	**Materials** Real Estate Technology	Consumer Discretionary Industrials Technology	Utilities Real Estate	**Consumer Staples** **Heathcare** Utilities
Smart Beta	Small Cap Value Large Cap Value	Small Cap Small Cap Value	Low Volatility Quality Dividend	Low Volatility Quality Dividend
Fixed Income	High Yield Investment Grade	**High Yield** Investment Grade	**High Yield** **Long-Dated Bonds**	Treasuries

Source: State Street Global Advisors, Bloomberg Finance L.P. The above diagram is for illustrative purposes only. Assets in bold represent those that scored well across *all* evaluation criteria, whereas assets in normal typeface represent those that scored well on the majority of the evaluation criteria.

Case Study Results

Sectors

To understand how the performance of equity sectors changes over time, we have opted to study the S&P 500 equity sectors across different business cycles since September 1989.

To start, we look at the **recovery** period, which is often the shortest phase in the cycle. In our analysis, only 10% of the observations belong to this phase. In the recovery period, a number of pro-cyclical sectors, such as technology and consumer discretionary, delivered a higher return than the US market benchmark[4] but they did not all beat the benchmark on a sustained basis, with the exception of **the materials sector** (see Exhibit 1).

Materials Outperformed Strongly in Recovery and Consumer Staples in Contraction

With over 70% of the sector in the chemical industry, the materials sector moves in conjunction with the business cycle and has a market beta of 1.08. The sector also participates most in bullish markets compared with other sectors over the analysis period. Intuitively, this appears to make sense as a sharp upturn in economic activity is likely to lead to the outperformance of sectors with the highest exposure to economic growth.

Across our evaluation criteria, technology also did well. The sector attained a robust level of excess return with some consistency, especially when judged from the perspective of the entire cycle and its market beta was roughly 30% higher than the broader market. In addition, the real estate sector beat expectations and returned more than the US market benchmark, possibly buoyed by anticipations for consumer and corporate spending strength.

On the other hand, defensive sectors, most notably utilities, trailed the benchmark during this period. This would be expected, as utilities are perceived to offer financial stability on account of their near-monopolistic position in the market and, moreover, because consumer demand is expected to remain fairly persistent across all stages of the cycle. Indeed, over 60%[5] of the sector consists of electric utilities that are heavily regulated by the Public Utility Commissions in each state in the US, which prescribes how much each company can charge consumers as well as its profit margin[6]. As a consequence, utilities are less responsive to the economic cycle.

The **expansionary phase** typically follows the recovery period. This part of the cycle is usually one of the lengthier periods, representing 35% of the observations. As the economy shifts beyond its initial stage of revival, and growth rates start to ease, the leadership of highly cyclical assets also begins to taper. More sectors now benefit from the economic boom, and this is demonstrated by the tightening of sector dispersion. Perhaps owing to this lack of dispersion, three sectors — namely, **consumer discretionary, industrials and technology** — stood out across all the evaluation criteria.

Considering solely the magnitude of excess return, technology and industrials companies came out on top. In the technology sector, the largest industry is software (31%), followed by services (26%) and hardware (19%). These industries are strongly geared to economic growth and are highly reactive to equity up-markets since their bull beta ranges between 1.37 and 1.66.[7] This seems logical as certain industries — namely software and hardware — typically pick up momentum as companies gain more confidence in the stability of an economic recovery and make sizeable capital expenditure investments.

In a similar vein, industrials performed well in this stage of the cycle and attained healthy relative returns — with remarkable levels of consistency. More than 70% of this sector comprises the capital goods industry group, which invariably benefits from the demand surge in an environment of sustained economic growth. The consumer discretionary sector has a similar tendency.

Conversely, counter-cyclical sectors (e.g. healthcare) trailed the benchmark. Half of the healthcare sector is made up of pharmaceutical and biotech companies, which are less affected by the business cycle as they maintain a substantial level of pricing power in the US. Research shows that Americans, on average, spend 30% more on drugs than Canadians and Europeans do[8], simply because the American healthcare system is less centralised and unlike in other countries, governments do not assume the role of price setter, thereby allowing companies to charge exorbitant prices for both patented drugs and insurance premium[9].

The **slowdown phase** often comes after the expansionary phase and accounts for 37% of the observations. In this stage of the cycle, real estate performed well during the analysis period. A possible reason for this may be that they are tied to economic growth, which is still positive, albeit decelerating. Much of the return in this sector emanates from the income generated by companies in the sector, which may help buffer against any losses that arise as the contractionary phase draws nearer.
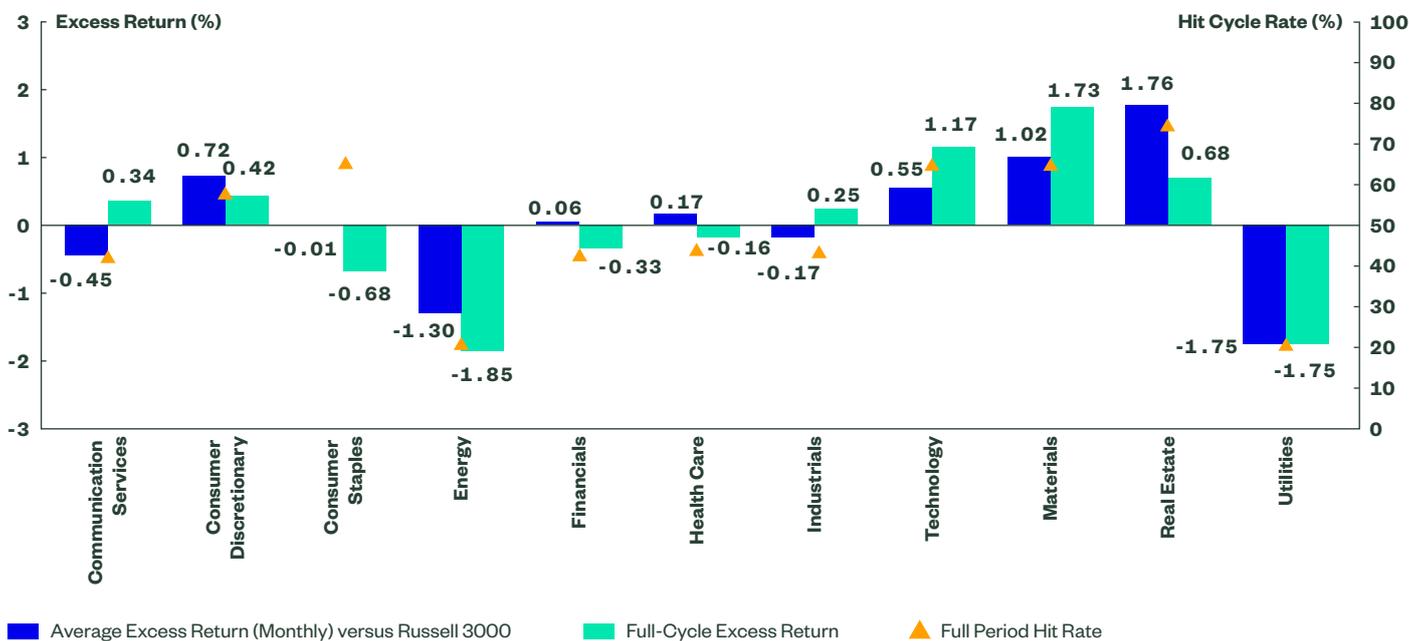
Towards the end of the cycle, investors may also brace themselves for an impending economic slowdown and this, in turn, drives up the demand for utilities, which are more tied to essential needs and are less economically sensitive. On the other hand, cyclical sectors such as industrials will lag behind.

Contraction marks the final phase of the cycle (18% of observations). In our analysis, it is the second shortest phase and is also the only phase where equities registered a negative annualised return (-19.23%). As economic growth falters, sectors that are economically sensitive fall out of favour, giving way to countercyclical sectors.
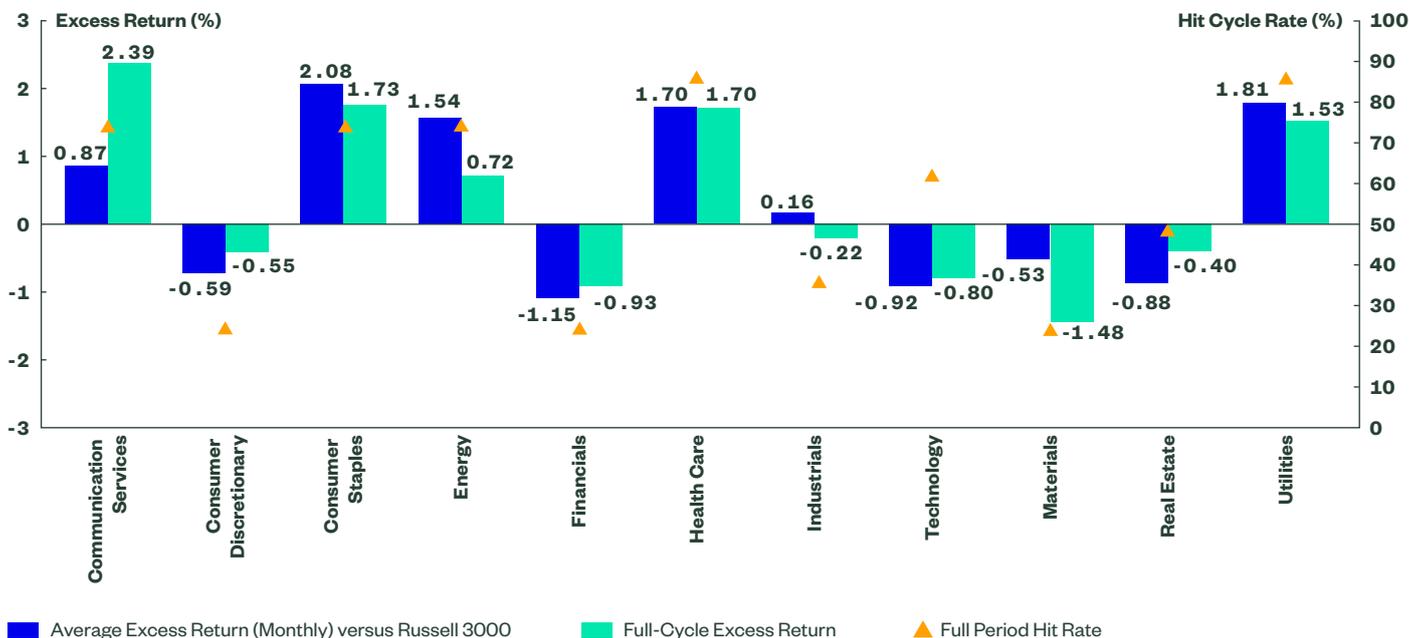
Among these sectors, **consumer staples** topped the table (see Figure 3) and produced a consistently significant level of return throughout the entire recession phase. With a bear beta of 0.61, the consumer staples sector has a low sensitivity to bear markets, highlighting its defensive properties. **Healthcare and utilities** were also frequent outperformers, as high dividend yield levels associated with these sectors helped them hold up relatively well during recessions.

Figure 3

**Sector Performance
in the Recovery and
Contractionary Phases**

Sector Performance
in Recovery Phase

Excess Return (%) — Hit Cycle Rate (%)

- Communication Services: -0.45, 0.34
- Consumer Discretionary: 0.72, 0.42
- Consumer Staples: -0.01, -0.68
- Energy: -1.30, -1.85
- Financials: 0.06, -0.33
- Health Care: 0.17, -0.16
- Industrials: -0.17, 0.25
- Technology: 0.55, 1.17
- Materials: 1.02, 1.73
- Real Estate: 1.76, 0.68
- Utilities: -1.75, -1.75

■ Average Excess Return (Monthly) versus Russell 3000   ■ Full-Cycle Excess Return   ▲ Full Period Hit Rate

Sector Performance in the
Contractionary Phases

Excess Return (%) — Hit Cycle Rate (%)

- Communication Services: 0.87, 2.39
- Consumer Discretionary: -0.59, -0.55
- Consumer Staples: 2.08, 1.73
- Energy: 1.54, 0.72
- Financials: -1.15, -0.93
- Health Care: 1.70, 1.70
- Industrials: 0.16, -0.22
- Technology: -0.92, -0.80
- Materials: -0.53, -1.48
- Real Estate: -0.88, -0.40
- Utilities: 1.81, 1.53

■ Average Excess Return (Monthly) versus Russell 3000   ■ Full-Cycle Excess Return   ▲ Full Period Hit Rate

Source: Bloomberg Finance L.P., State Street Global Advisors. Monthly data between September 1989 to May 2019, with the exception of "Real Estate".
Monthly data between October 2001 to May 2019 for real estate. Please refer to Appendix A for all the sources used in the analysis.

Sector performance shown are as of the date indicated and are subject to change. This information should not be considered a recommendation to invest in a particular sector or to buy or sell any security shown. It is not known whether the sectors or securities shown will be profitable in the future.

Smart Beta

Our analysis of smart beta strategies spans business cycles from August 1991 to the present. In the **recovery phase**, when the economy begins its turnaround, **value strategies**, regardless of market capitalisation, excelled among all the smart beta strategies under consideration in this analysis (see Figure 2). In broad terms, value stocks are those that are priced beneath their intrinsic value and can be expected to rebound strongly as the state of the economy improves; indeed, the data illustrated this tendency. Predictably, low volatility, which periodically rebalances to target the least volatile stocks, trailed the US benchmark[10] as the safer, more defensive stocks lose their attractiveness in a strong bull market.

During the **expansionary part** of the cycle, **size**, which encompasses both **mid- and small-cap** stocks, delivered a positive excess return on both a monthly and a full-cycle basis, and with a high hit rate. While small-caps outpaced mid-caps, the difference was somewhat marginal over the study period. Defensive strategies, namely Quality Dividends and Low Volatility, fell behind in an environment where economic growth was solid.

Quality Dividend and Low Volatility Did Well in Slowdown and Contraction

As growth prospects moderate in the **slowdown** phase, defensive strategies prospered. Of note, **quality dividends and low volatility** delivered positive excess returns above the US benchmark, with a reasonable level of consistency. In this phase, investors may start bracing themselves for a bearish market and begin to target strategies that have reduced sensitivity to the broader market. Low Volatility, with a bear beta of 0.68, falls into this category.

With bearish sentiment establishing itself firmly in the **contractionary phase**, the intensity and consistency of outperformance rises for **quality dividends and low volatility**.[11] Conversely, periods of positive but declining growth that relate to slowdowns and outright contractions prove to be challenging environments for small- and mid-cap companies.

Figure 4
Smart Beta Performance in the Recovery and contractionary Phases
Smart Beta Performance in the Recovery Phase
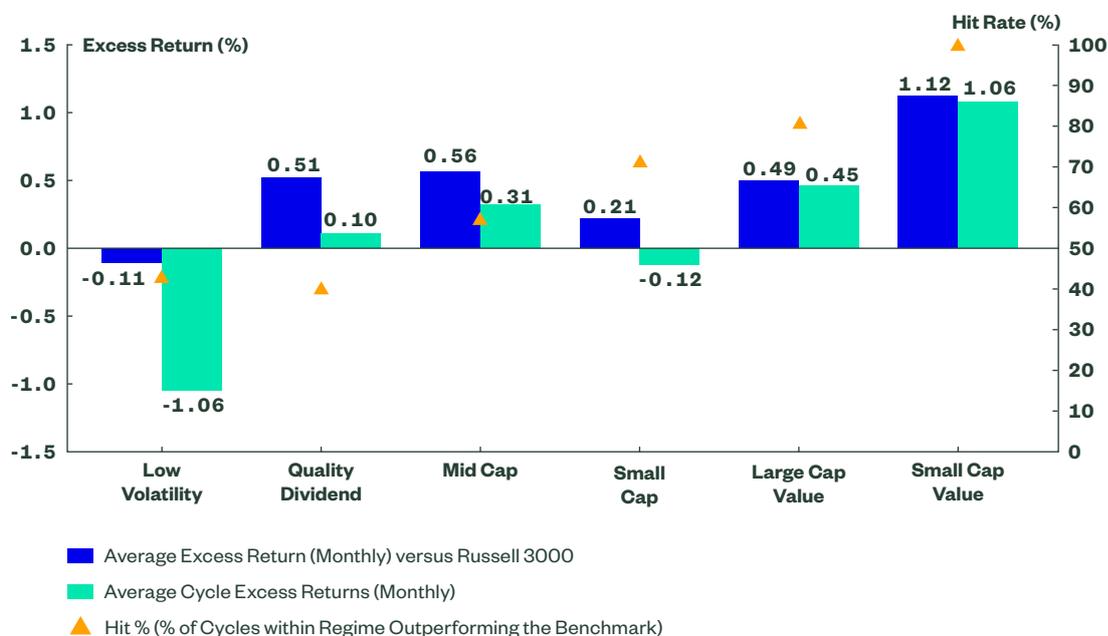
Excess Return (%)   **Hit Rate (%)**

	Low Volatility	Quality Dividend	Mid Cap	Small Cap	Large Cap Value	Small Cap Value
Average Excess Return	-0.11	0.51	0.56	0.21	0.49	1.12
Average Cycle Excess Returns	-1.06	0.10	0.31	-0.12	0.45	1.06

- ■ Average Excess Return (Monthly) versus Russell 3000
- ■ Average Cycle Excess Returns (Monthly)
- ▲ Hit % (% of Cycles within Regime Outperforming the Benchmark)

Smart Beta Performance in the contractionary Phase

Excess Return (%)   **Hit Rate (%)**

	Low Volatility	Quality Dividend	Mid Cap	Small Cap	Large Cap Value	Small Cap Value
Average Excess Return	1.53	1.51	-0.01	-0.51	0.37	-0.46
Average Cycle Excess Returns	1.31	1.22	-0.49	-1.21	0.08	-1.80

- ■ Average Excess Return (Monthly) versus Russell 3000
- ■ Average Cycle Excess Returns (Monthly)
- ▲ Hit % (% of Cycles within Regime Outperforming the Benchmark)

Source: Bloomberg Finance L.P., State Street Global Advisors. Monthly data between September 1989 to May 2019, with the exception of Quality Dividend, Small Cap Value and Large Cap Value. Monthly Data between December 1999 to May 2019 for "Quality Dividend". Monthly Data between November 1998 to May 2019 for "Large Cap Value" and monthly data between June 2006 to May 2019 for "small cap value". Please refer to Appendix B for all the sources used in the analysis.

Smart beta performance shown are as of the date indicated and are subject to change. This information should not be considered a recommendation to invest in a particular sector or to buy or sell any security shown. It is not known whether the sectors or securities shown will be profitable in the future.

Fixed Income

Finally, we study the performance of bond strategies vis a vis their benchmark[12] across business cycles from February 1992. In the fixed income space, **high yield corporate bonds led the pack during the recovery phase,** a period when the recovery starts to revive. During this period, high yield bond emissions are usually expected to recover from their lows in the recessionary phase and company defaults are less common.

As a consequence, they tend to be more geared to a positive economic outlook and corporate earnings than changes in interest rates. Besides, they often have low duration because they are typically issued either with short maturities or are callable after a short period of time. Their characteristics are more closely akin to equities in many respects, though with diminished volatility. This is because they generate much of their return from income and they will be reimbursed earlier than equities, in the event of issuer debt default, for instance.

Our analysis shows that the performance of other credit sensitive instruments, such as **investment grade corporate bonds,** also trumped that of many other types of fixed income instruments for the same reason, because they are also exposed to credit risk, albeit to a lesser degree.

Both types of **credit-sensitive bonds** and, in particular, **high yield bonds,** continued to eclipse other types of fixed income instruments in **expansionary periods,** even if the average level of return they generated had gone down. Less economically sensitive bonds, notably government bonds, performed poorly.

High Yield and Long-Dated Bonds Excelled in Slowdown

As the economy moves to the **slowdown** phase, we saw a reversal of fortune. More interest-rate sensitive instruments, most notably **longer-dated government bonds** and **investment grade corporate bonds,** reigned supreme. High yield bonds were hit hard in this environment, even though they still delivered a positive average return. This contrasts starkly with the **contractionary phase,** when both high yield and investment grade bonds faltered and **government bonds** were the only category of bonds that achieved a positive return.

Figure 5
Fixed Income Performance in the recovery and contractionary phases
Fixed Income Performance in the Recovery Phase

Excess Return (%) / Hit Rate (%)

	1–3 Treasury	3–7 Treasury	7–10 Treasury	10+ Treasury	Broad Treasury	Inflation-Linked Gov	0–3 Corporate	Intermediate Corporate	Long Corporate	Broad Corporate	High Yield
Average Excess Return (Monthly)	0.15	0.17	0.20	0.24	0.20	0.45	0.47	0.61	0.97	0.70	1.13
Average Cycle Excess Return	0.05	-0.05	-0.09	0.13	0.01	0.38	0.39	0.52	1.04	0.66	1.73

■ Average Excess Return (Monthly) versus US 1–3 Month Treasury Bills   ■ Average Cycle Excess Return
▲ Hit % (% of Cycles Within Regime Outperforming the Benchmark)

Fixed Income Performance in the Contractionary Phase

Excess Return (%) / Hit Rate (%)

	1–3 Treasury	3–7 Treasury	7–10 Treasury	10+ Treasury	Broad Treasury	Inflation-Linked Gov	0–3 Corporate	Intermediate Corporate	Long Corporate	Broad Corporate	High Yield
Average Excess Return (Monthly)	0.29	0.64	0.80	0.87	0.59	0.04	0.07	-0.01	-0.31	-0.08	-0.87
Average Cycle Excess Return	0.28	0.70	0.95	1.07	0.66	0.04	0.17	0.23	-0.08	0.16	-0.80

■ Average Excess Return (Monthly) versus US 1–3 Month Treasury Bills   ■ Average Cycle Excess Return
▲ Hit % (% of Cycles Within Regime Outperforming the Benchmark)

Source: Bloomberg Finance L.P., State Street Global Advisors. Monthly data between February 1992 to May 2019, with the exception of "Inflation Linked Gov". Monthly Data between February 1997 to May 2019 for "Inflation Linked Gov". Please refer to Appendix C for all the sources used in the analysis.

Fixed income performance shown are as of the date indicated and are subject to change. This information should not be considered a recommendation to invest in a particular sector or to buy or sell any security shown. It is not known whether the sectors or securities shown will be profitable in the future.

Conclusion

The analysis above serves to provide a general guide on how assets behave in different parts of the business cycle. Of course, each business cycle is unique and additional analysis, on the basis of fundamentals, may provide more insights on what assets are likely to outperform in the near term. Additionally, secular industry trends, as well as technological advances, are less influenced by economic cycles and may provide growth opportunities over multiple cycles.

Appendix A: Sectors

Average Monthly Excess Return of Sectors in Different Cycles

	Communication Services (%)	Consumer Discretionary (%)	Consumer Staples (%)	Energy (%)	Financials (%)	Health Care (%)	Industrials (%)	Technology (%)	Materials (%)	Real Estate (%)	Utility (%)
Recovery	-0.45	0.72	-0.01	-1.30	0.06	0.17	-0.17	0.55	1.02	1.76	-1.75
Expansion	-0.97	0.16	-0.66	-0.35	0.28	-0.58	0.15	0.59	0.19	-0.21	-1.15
Slowdown	-0.05	0.05	0.01	-0.16	-0.09	0.24	-0.18	0.01	-0.66	1.04	0.61
Contraction	0.87	-0.59	2.08	1.54	-1.15	1.70	0.16	-0.92	-0.53	-0.88	1.81

■ Green cells represent positive values
■ Yellow cells represent negative values

Average Full Period Excess Return of Sectors in Different Cycles (Monthly)

	Communication Services (%)	Consumer Discretionary (%)	Consumer Staples (%)	Energy (%)	Financials (%)	Health Care (%)	Industrials (%)	Technology (%)	Materials (%)	Real Estate (%)	Utilities (%)
Recovery	0.34	0.42	-0.68	-1.85	-0.33	-0.16	0.25	1.17	1.73	0.68	-1.75
Expansion	-0.89	0.14	-0.60	-0.78	0.24	-0.71	0.15	0.32	0.33	-0.03	-0.99
Slowdown	-0.13	-0.24	0.10	-0.41	0.11	0.19	-0.32	-0.08	-0.78	0.99	0.69
Contraction	2.39	-0.55	1.73	0.72	-0.93	1.70	-0.22	-0.80	-1.48	-0.40	1.53

■ Green cells represent positive values
■ Yellow cells represent negative values

Exhibit 1c
Average Monthly Hit Rate of Sectors in Different Cycles

	Communication Services (%)	Consumer Discretionary (%)	Consumer Staples (%)	Energy (%)	Financials (%)	Health Care (%)	Industrials (%)	Technology (%)	Materials (%)	Real Estate (%)	Utilities (%)
Recovery	43.75	59.38	59.38	40.63	53.13	50.00	46.88	53.13	68.75	21.88	31.25
Expansion	40.74	53.33	35.56	41.48	54.07	40.74	59.26	57.04	50.37	24.44	35.56
Slowdown	50.38	55.64	50.38	47.37	53.38	55.64	43.61	46.62	38.35	39.10	56.39
Contraction	51.79	39.29	67.86	62.50	39.29	69.64	57.14	50.00	41.07	26.79	62.50

☐ White cells represent values less than or equal to 50%

▢ Red cells represent values greater than 50% but less than 60%

▢ Blue cells represent values greater than or equal to 60%

Exhibit 1d
Average Full Period Hit Rate of Sectors in Different cycles

	Communication Services (%)	Consumer Discretionary (%)	Consumer Staples (%)	Energy (%)	Financials (%)	Health Care (%)	Industrials (%)	Technology (%)	Materials (%)	Real Estate (%)	Utilities (%)
Recovery	44.44	55.56	66.67	22.22	44.44	44.44	44.44	66.67	66.67	75.00	22.22
Expansion	35.00	70.00	20.00	25.00	60.00	30.00	75.00	65.00	50.00	50.00	15.00
Slowdown	47.62	38.10	57.14	38.10	52.38	57.14	23.81	42.86	28.57	75.00	71.43
Contraction	75.00	25.00	75.00	75.00	25.00	87.50	37.50	62.50	25.00	50.00	87.50

Source: Bloomberg Finance L.P., State Street Global Advisors. Monthly data between September 1989 to May 2019. Communication Services is represented by the S&P 500 Communication Services Index, Consumer Discretionary is represented by the S&P 500 Consumer Discretionary Index, Consumer Staples is represented by the S&P 500 Consumer Staples Index, Energy is represented by the S&P 500 Energy Index, Financials is represented by the S&P 500 Financials Index, Healthcare is represented by the S&P 500 Healthcare index, Industrials is represented by the S&P 500 Industrials Index, Technology is represented by the S&P 500 Information Technology Index, Materials is represented by the S&P 500 Materials Index, Real Estate is represented by the S&P 500 Real Estate Index.

☐ White cells represent values less than or equal to 50%

▢ Red cells represent values greater than 50% but less than 60%

▢ Blue cells represent values greater than or equal to 60%

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Appendix B: Smart Beta

Average Monthly Excess Return of Smart Beta in Different Cycles

	Low Volatility (%)	Quality Dividend (%)	S&P 500 Total Return Index (%)	Mid Cap (%)	Small Cap (%)	Small Cap Value (%)	Large Cap Value (%)
Recovery	-0.11	0.51	-0.08	0.56	0.21	1.12	0.49
Expansion	-0.57	-0.11	-0.07	0.22	0.30	0.15	0.10
Slowdown	0.29	0.22	0.00	0.07	-0.19	-0.25	0.10
Contraction	1.53	1.51	0.16	-0.01	-0.51	-0.46	0.37

■ Green cells represent positive values
■ Yellow cells represent negative values

Exhibit 2b

Average Full Period Excess Return of Smart Beta in Different Cycles (Monthly)

	Low Volatility (%)	Quality Dividend (%)	S&P 500 Total Return Index (%)	Mid Cap (%)	Small Cap (%)	Small Cap Value (%)	Large Cap Value (%)
Recovery	-1.06	0.10	-0.01	0.31	-0.12	1.06	0.45
Expansion	-0.39	0.03	-0.13	0.47	0.47	0.19	-0.01
Slowdown	0.42	0.26	0.02	0.05	-0.50	-0.46	0.04
Contraction	1.31	1.22	0.26	-0.49	-1.21	-1.80	0.08

■ Green cells represent positive values
■ Yellow cells represent negative values

Exhibit 2c
**Average Monthly Hit
Rate of Smart Beta
in Different Cycles**

	Low Volatility (%)	Quality Dividend (%)	S&P 500 Total Return Index (%)	Mid Cap (%)	Small Cap (%)	Small Cap Value (%)	Large Cap Value (%)
Recovery	31.25	31.25	25.00	50.00	40.63	12.50	46.88
Expansion	39.26	28.15	41.48	53.33	57.04	26.67	40.00
Slowdown	54.89	36.84	54.89	50.38	40.60	18.05	39.85
Contraction	55.36	41.07	50.00	33.93	39.29	10.71	37.50

☐ White cells represent values less than or equal to 50%

☐ Red cells represent values greater than 50% but less than 60%

☐ Blue cells represent values greater than or equal to 60%

Exhibit 2d
**Average full Period
Hit Rate of Smart Beta
in Different Cycles**

	Low Volatility (%)	Quality Dividend (%)	S&P 500 Total Return Index (%)	Mid Cap (%)	Small Cap (%)	Small Cap Value (%)	Large Cap Value (%)
Recovery	42.86	40.00	28.57	57.14	71.43	100.00	80.00
Expansion	21.05	41.67	31.58	63.16	68.42	75.00	61.54
Slowdown	66.67	58.33	66.67	42.86	33.33	12.50	53.85
Contraction	85.71	80.00	85.71	14.29	14.29	0.00	60.00

Source: Bloomberg, State Street Global Advisors. Monthly data between September 1989 to May 2019, with the exception of Quality Dividend, Small Cap Value and Large Cap Value. Monthly Data between December 1999 to May 2019 for "Quality Dividend". Monthly Data between November 1998 to May 2019 for "Large Cap Value" and monthly data between June 2006 to May 2019 for "small cap value". Low Volatility is represented by the S&P 500 Low volatility index, Quality dividend is represented by the S&P High Yield Dividend Aristocrats Index, Mid cap is represented by the S&P 400 Mid cap index, Small cap is represented by the Russell 2000 Index, Small cap value is represented by the MSCI USA Small Cap Value Index and Large Cap Value is represented by the MSCI USA Value Exposure Select Index.

☐ White cells represent values less than or equal to 50%

☐ Red cells represent values greater than 50% but less than 60%

☐ Blue cells represent values greater than or equal to 60%

Appendix C: Fixed Income

Exhibit 3a

Average Monthly Excess Return of Smart Beta in Different Cycles

	1–3 Treasury (%)	3–7 Treasury (%)	7–10 Treasury (%)	10+ Treasury (%)	Broad Treasury (%)	Inflation-Linked Gov (%)	0–3 Corporate (%)	Intermediate Corporate (%)	Long Corporate (%)	Broad Corporate (%)	High Yield (%)
Recovery	0.15	0.17	0.20	0.24	0.20	0.45	0.47	0.61	0.97	0.70	1.13
Expansion	0.01	-0.03	-0.10	-0.12	-0.06	0.21	0.17	0.25	0.44	0.30	0.84
Slowdown	0.09	0.30	0.49	0.78	0.36	0.33	0.15	0.32	0.49	0.37	0.33
Contraction	0.29	0.64	0.80	0.87	0.59	0.04	0.07	-0.01	-0.31	-0.08	-0.87

▢ Green cells represent positive values
▢ Yellow cells represent negative values

Exhibit 3b

Average Full Period Excess Return of Fixed Income in Different Cycles (Monthly)

	1–3 Treasury (%)	3–7 Treasury (%)	7–10 Treasury (%)	10+ Treasury (%)	Broad Treasury (%)	Inflation-Linked Gov (%)	0–3 Corporate (%)	Intermediate Corporate (%)	Long Corporate (%)	Broad Corporate (%)	High Yield (%)
Recovery	0.05	-0.05	-0.09	0.13	0.01	0.38	0.39	0.52	1.04	0.66	1.73
Expansion	0.02	0.03	0.01	0.05	0.01	0.33	0.15	0.26	0.52	0.33	0.67
Slowdown	0.15	0.45	0.70	1.14	0.54	0.41	0.20	0.43	0.68	0.52	0.35
Contraction	0.28	0.70	0.95	1.07	0.66	0.04	0.17	0.23	-0.08	0.16	-0.80

▢ Green cells represent positive values
▢ Yellow cells represent negative values

Exhibit 3C
Average Monthly Hit Rate of Fixed Income in Different Cycles

	1–3 Treasury (%)	3–7 Treasury (%)	7–10 Treasury (%)	10+ Treasury (%)	Broad Treasury (%)	Inflation-Linked Gov (%)	0–3 Corporate (%)	Intermediate Corporate (%)	Long Corporate (%)	Broad Corporate (%)	High Yield (%)
Recovery	46.9	43.8	43.8	40.6	40.6	37.5	56.3	56.3	43.8	53.1	56.3
Expansion	52.6	48.1	48.9	46.7	46.7	43.0	64.4	62.2	54.8	60.7	74.1
Slowdown	55.6	54.9	56.4	60.9	57.1	45.9	61.7	58.6	62.4	60.2	63.2
Contraction	62.5	58.9	51.8	51.8	55.4	46.4	51.8	48.2	37.5	46.4	39.3

☐ White cells represent values less than or equal to 50%

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☐ Blue cells represent values greater than or equal to 60%

Exhibit 3d
Average Full Period Hit Rate of Fixed Income in Different Cycles

	1–3 Treasury (%)	3–7 Treasury (%)	7–10 Treasury (%)	10+ Treasury (%)	Broad Treasury (%)	Inflation-Linked Gov (%)	0–3 Corporate (%)	Intermediate Corporate (%)	Long Corporate (%)	Broad Corporate (%)	High Yield (%)
Recovery	57.1	71.4	71.4	42.9	57.1	50.0	85.71	85.71	85.7	85.7	85.7
Expansion	60.0	45.0	50.0	50.0	50.0	40.0	60.0	60.0	55.0	60.0	70.0
Slowdown	71.4	66.7	61.9	71.4	66.7	47.6	76.2	71.4	71.4	76.2	66.7
Contraction	75.0	75.0	75.0	75.0	75.0	37.5	62.5	50.0	37.5	50.0	12.5

Source: Bloomberg Finance L.P., State Street Global Advisors. Monthly data between February 1992 to May 2019, with the exception of "Inflation Linked Gov". Monthly Data between February 1997 to May 2019 for "Inflation Linked Gov". 1–3 Treasury is represented by Bloomberg Barclays US Treasury 1–3 Years Index, 3–7 Treasury is represented by Bloomberg Barclays US Treasury 3–7 Index, 7–10 Treasury is represented by Bloomberg Barclays US Treasury 7–10 Index, 10+ Treasury is represented by Bloomberg Barclays US Long Treasury Index. Broad Treasury is represented by Bloomberg Barclays US Treasury Index, Inflation-linked Gov is represented by Bloomberg Barclays US Gov Inflation-linked All Maturities Index, 0–3 Corporate is represented by Bloomberg Barclays US Corporate 0–3 Year Index, Intermediate Corporate is represented by Bloomberg Barclays Intermediate Corporate Index, Long Corporate is represented by Bloomberg Barclays Long Corporate Index, Broad Corporate is represented by Bloomberg Barclays US Corporate Index, High Yield is represented by Bloomberg Barclays US Corporate High Yield Index and ICE BofAML 0–5 Year US High Yield Constrained Index.

☐ White cells represent values less than or equal to 50%

☐ Red cells represent values greater than 50% but less than 60%

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About SPDR ETF Portfolio Solutions

The SPDR ETF Portfolio Solutions team provides in-depth portfolio analytics to assist clients with their asset allocation, portfolio construction, and risk management.

Endnotes

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