

THE CARLYLE GROUP

GLOBAL ALTERNATIVE ASSET MANAGEMENT

Carlyle Economic Indicators



Illuminate
ANALYSIS THAT REVEALS

Data received as of January 23, 2017

2017 Review & Outlook: Great Expectations

The link between asset prices and the real economy can be tenuous. The bull market since 2009 is a case in point. Annualized U.S. stock returns of 14% per year have come in the context of historically weak U.S. GDP growth. Assets' underlying cash flows (sales, earnings, dividends, rents, etc.) have risen modestly, but the price, or multiple, investors have been willing to pay for them has surged. Since the end of 2012, multiple expansion has accounted for nearly 80% of the cumulative increase in U.S. corporate asset prices, as 2.5% annual earnings growth somehow managed to support a 55% rise in stocks.

Inevitably, real economic conditions reassert themselves as the primary determinant of asset prices. This process appears to have received an unexpected boost from the U.S. Presidential election. Over the past seven years, stock rallies have been driven by accommodative monetary policy and the concomitant decline in "risk-free" interest rates.¹ But since the U.S. election, global stocks have risen more than 7%, on average, despite a sudden 70 basis point increase in 5-and-10 year Treasury yields. Unlike the "Taper Tantrum" of 2013 and the December 2015 Fed rate hike, rising rates have not depressed valuations because they are the product of faster expected nominal income growth.

It is far from clear whether the expected acceleration in growth rates will actually materialize. Asset prices are forward-looking, but not always forward-seeing. But the game seems to have changed. After years of intense focus on central bank policy, falling discount rates, and the "search for yield," investors can turn their attention back to fundamentals.

Portfolio Company Data: Facts and Interpretations

There is no better measure of economic fundamentals than raw data obtained directly from operating businesses. Company results are free from the ephemeral swings in sentiment that infect survey data, such as confidence indicators or the purchasing manager indexes. Company data are also free of the errors introduced by the aggregation, estimation, and multiple seasonal adjustments that bedevil (frequently revised) official statistics.

But raw portfolio company data do not speak for themselves; they must be interpreted in a coherent framework that separates company-specific factors from information that is truly macroeconomic in origin. The lure of "Big Data" and advances in database software and computational power can distract from the interpretational challenge of assigning economic meaning to the raw numbers.

Indeed, the interpretation of portfolio company data is often subject to its own biases. There can be a tendency

¹ The U.S. Treasury or swaps curve represents the base term structure of interest rates used to discount all future cash flows. When 10-year Treasury yields fall from 4% to 1.5%, the present value of a \$100 payment due in 10 years rises by 30%, from \$66 to \$86. The market value of a \$100 of corporate earnings or dividends due on the same date should rise proportionally. If multiples failed to adjust upwards, corporate assets and real estate would become irrationally cheap relative to bonds, with their future cash flows priced at a discount to fair (present) value.

among some general partners to attribute strong company results to superior investment selection, a well-formulated corporate strategy, and superb management team. Likewise, disappointing company data can be attributed to macroeconomic "headwinds." In truth, the sales, orders, production volumes, and capacity utilization of each company or division can be decomposed into micro and macro components. But such performance attribution must be done on a systematic basis so as to identify the trend common to both proprietary and public data and separate actionable information from "noise."

Carlyle Economic Indicators – From Raw Data to Robust Forecast

In asset pricing, it is common to measure the covariance between the returns of an individual stock (or portfolio of stocks) and the market as a whole. This covariance – commonly known as "beta" – can be used to estimate the portion of a stock's returns attributable to the broader market. Any persistent return in excess of this systematic component is generally referred to as "alpha," or stock-specific outperformance.

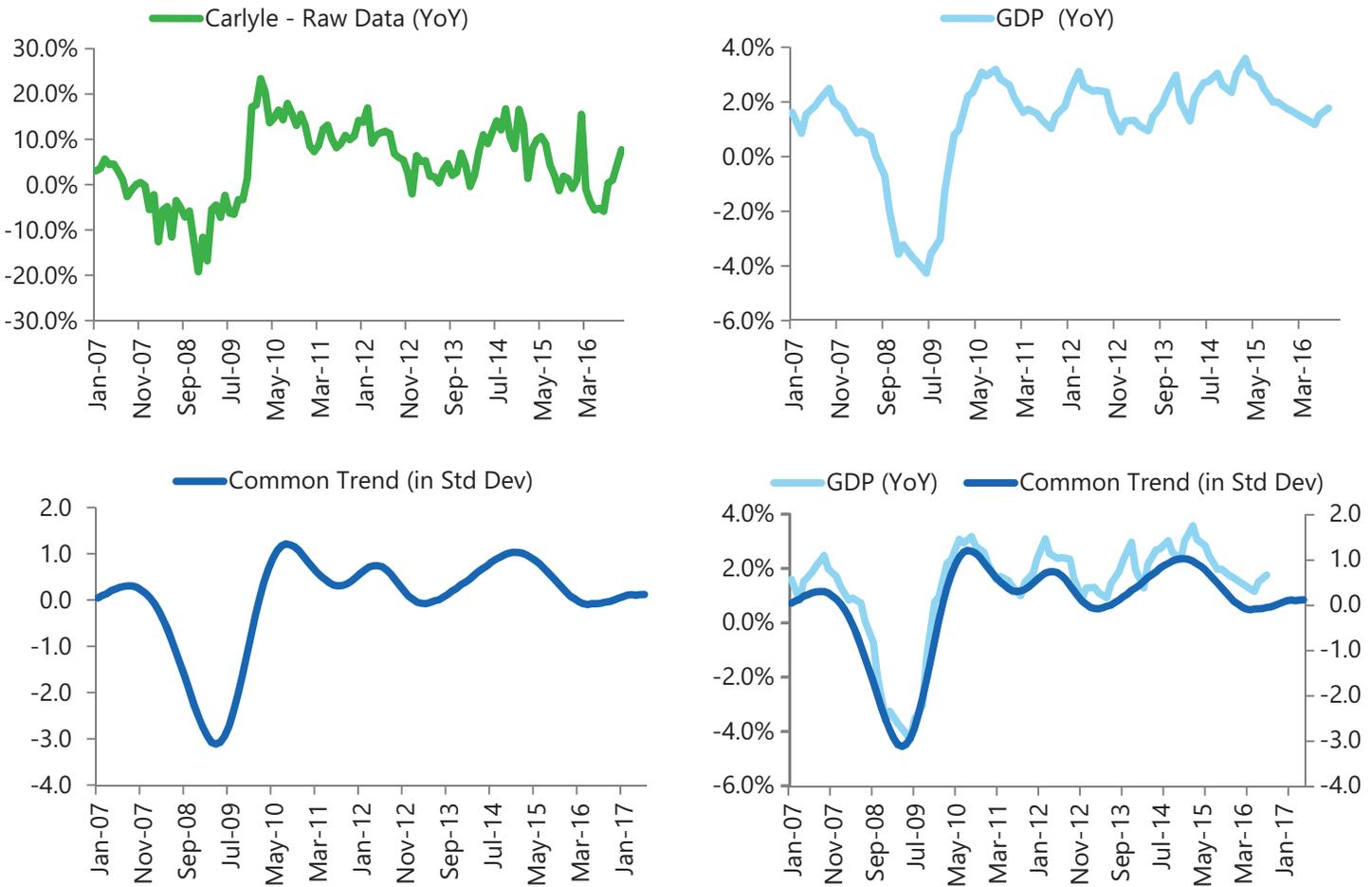
Portfolio company data can be decomposed in a similar fashion. The "beta" in this case measures the sensitivity of business volumes to some macroeconomic variable, such as GDP, industrial production, or retail sales. The "alpha" captures company performance in excess of that which can be explained by its exposure to macroeconomic factors. This "alpha-beta" decomposition serves as the starting point for our macroeconomic analysis.

Unlike government statisticians, who seek the most "representative" businesses to survey when constructing samples of total economic activity, we rely on those "high beta" portfolio company time series that vary predictably in response to macroeconomic fluctuations. Often, these time series are raw company performance indicators rather than accounting results. Hotel and travel bookings, new auto shipments, industrial engine orders, and ball bearing volumes may account for a trivially small share of economic activity, but all depend inordinately on broader trends in disposable income, consumer confidence, and business spending. As a result, the monthly *variation* in these portfolio data can provide an important signal about the current strength of the economy.

Figure 1 provides a graphic depiction of the process through which raw portfolio data are converted into robust economic indicators. First, a portfolio company time series (or a vector of data from multiple portfolio companies) is selected because of its sensitivity to the fluctuations of a macroeconomic variable. In this case, we selected cargo throughput volumes (top left panel of Figure 1) as an *Indicator* for U.S. GDP (top right panel) because of the 95% correlation in levels and 76% correlation in the monthly percentage change between the two series. As an indicator

FIGURE 1

Carlyle Indicators from Raw Data to Robust Forecast



variable, cargo volumes are also pro-cyclical (note the difference in scale between the two graphs) and leading, with peaks and troughs that pre-date those of GDP growth by three-to-six months, on average.

Next, we use Markov Chain Monte Carlo (MCMC) methods to estimate the unobserved trend the portfolio data shares in common with the macro variable. The common trend (bottom left panel of Figure 1) moves up and down with the portfolio data, but at a lower frequency so as to abstract from (i.e. ignore) the random noise present in one series but not the other. This common trend is the “distilled” version of the portfolio company data, which captures only the portion of company performance with a clear macroeconomic origin.

Finally, we “fit” the common trend to official data, as shown in the bottom right panel of Figure 1. The common trend explains 80.2% of the joint variation between the cargo volumes and GDP over the past 11 years. The common trend generates a reliable forecast of near-term GDP growth (see the three-month forward estimate in the bottom right panel of Figure 1) and assists in the interpretation of inherently noisy and frequently-revised official data. As new observations arrive, the common trend is updated monthly to account for observed changes in the portfolio

company growth rate and changes in the covariation between portfolio company data and official statistics.

What We Learned in 2016

Table 1 reports the results from our data in 2016 and the joint correlation between the portfolio *Indicator*, official data, and estimated common trend. Tables 2 through 8 summarize how the portfolio data compared relative to contemporaneous “consensus” forecasts, as measured by surveys conducted by the Federal Reserve and Bloomberg. In the first half of 2016, portfolio data were somewhat weaker than expectations in advanced economies like the U.S., Europe, and Japan, but much stronger in China. Relatively strong Chinese data were especially surprising given that most observers anticipated a significant slowdown in China, particularly in the industrial sector, with global ramifications for manufacturing activity and financial markets.²

Rebound in China

Most of our *Indicators* for Chinese industrial demand come from 15 large mines located in the Queensland and Pilbara regions of Australia. The common trends extracted from the production of seaborne commodities at these mines have proven to be 77% and 89% correlated with the annual growth rate of Chinese industrial production and fixed

² Turner, A. “A Socialist Market Economy with Chinese Contradictions,” December 30, 2016.

TABLE 1

Summary of 2016 Results

Data Point	Carlyle Indicator															
	Joint Correlation	Sep15	Oct15	Nov15	Jan16	Feb16	Mar16	Apr16	May16	Jun16	Jul16	Aug16	Sep16	Oct16	Nov16	Dec16
US Gross Trade Volumes / GDP	80.2%	+1.7%	+1.4%	+1.5%	+0.5%	+0.4%	+1.0%	+0.7%	+1.0%	+1.4%	+0.7%	+0.4%	+0.7%	+1.0%	+1.2%	+1.5%
US Real Retail Sales	70.5%	+2.4%	+2.5%	+2.8%	+2.7%	+2.6%	+2.9%	+2.0%	+2.0%	+2.4%	+2.0%	+2.1%	+2.1%	+2.1%	+2.2%	+2.2%
US Energy-Related Industrial	90.6%	-16.8%	-18.0%	-20.3%	-20.0%	-20.8%	-19.5%	-17.1%	-19.5%	-23.1%	-20.5%	-18.1%	-19.8%	-23.2%	-24.9%	-21.6%
US Business Spending / CapEx	76.0%	+3.0%	+3.2%	+4.3%	+1.6%	-2.1%	-0.6%	-1.0%	-3.1%	-1.6%	-2.7%	-3.8%	-3.1%	-2.5%	-1.5%	-1.8%
US Industrial Production	83.5%	-1.2%	-0.9%	+0.1%	+0.6%	+1.0%	+1.8%	+1.0%	+1.8%	+1.3%	+1.1%	+0.1%	-0.1%	-0.6%	-0.9%	-0.9%
US Nonresidential Construction	79.1%	+14.9%	+13.4%	+12.8%	+11.8%	+10.9%	+12.5%	+13.8%	+15.8%	+13.7%	+13.6%	+9.4%	+8.8%	+5.6%	+3.2%	+3.7%
US New Auto Sales	72.2%	17.8M	18.2M	18.3M	18.3M	18.4M	18.0M	17.4M	17.5M	17.6M	17.6M	17.9M	17.0M	17.8M	18.0M	17.8M
US Industrial Orders (Ex-Energy)	84.2%	+1.2%	+1.4%	+1.1%	+0.8%	+0.8%	+0.9%	+0.5%	+0.1%	-0.6%	-0.3%	-0.1%	-0.1%	-0.3%	-0.4%	+0.0%
Euro Area Industrial Production	88.1%	+0.0%	+0.4%	-0.2%	-1.2%	-1.7%	-0.9%	-1.1%	-0.8%	-0.4%	-0.6%	-0.4%	-0.6%	+0.6%	+1.2%	+2.2%
Euro Area Business Volumes / GDP	74.6%	+0.8%	+1.1%	+0.8%	+0.6%	+0.6%	+0.6%	+0.7%	+1.0%	+0.9%	+1.0%	+1.1%	+0.9%	+1.1%	+1.2%	+1.3%
Euro Area Retail Sales	81.1%	+1.6%	+2.0%	+1.8%	+1.4%	+1.4%	+1.1%	+1.9%	+1.1%	+0.9%	+1.0%	+0.9%	+1.3%	+1.4%	+1.9%	+2.8%
Euro Area Industrial Equipment / Manufacturing	84.3%	-0.8%	-2.0%	-0.3%	-0.8%	-1.0%	-0.2%	+0.1%	+0.1%	+0.7%	+0.0%	+0.2%	-0.4%	+0.5%	+1.2%	+1.9%
German Factory Orders	86.8%	+0.4%	-0.5%	-0.8%	-3.0%	-2.6%	-2.1%	-2.1%	-0.8%	-0.2%	-1.8%	-1.2%	-1.0%	+0.3%	+1.4%	+4.1%
China Industrial Demand (Price Index)	63.0%	46.9	45.5	44.3	46.8	47.6	48.9	49.4	47.4	47.7	48.8	48.4	47.43	47.92	51.5	52.0
China Industry Value Added	77.8%	+5.8%	+6.0%	+6.5%	+6.9%	+7.0%	+7.1%	+7.0%	+6.8%	+6.8%	+6.8%	+6.8%	+7.0%	+6.9%	+7.1%	
China Retail Sales	84.5%	+11.3%	+10.8%	+10.7%	+9.4%	+9.4%	+9.1%	+9.5%	+9.3%	+9.7%	+9.1%	+9.0%	+9.0%	+9.0%	+7.8% ¹	
China Fixed Investment	89.7%	+8.3%	+8.4%	+8.9%	+8.4%	+8.8%	+9.0%	+9.4%	+9.2%	+9.2%	+9.1%	+8.7%	+8.7%	+8.7%	+8.7%	
China Residential Inventories (Months of Sales)	N/A	11.06	10.85	10.20	9.10	8.99	9.14	7.77	7.54	7.44	7.64	7.29	6.55	7.06	6.63	6.75
Japan Industrial Production	95.5%	-1.2%	-1.2%	-3.1%	-3.3%	-4.4%	-3.3%	-3.3%	+0.1%	+0.1%	-0.1%	-0.1%	+0.1%	-0.3%	-0.3%	+0.7%
Brazil Retail Sales	71.2%	-2.6%	-5.0%	-5.0%	-4.9%	-5.7%	-5.8%	-4.4%	-3.8%	-4.5%	-4.6%	-4.0%	-4.7%	-5.2%	N/A ²	

1. Underlying portfolio data reference changed due to availability

2. LatAm retail sales were measured in November 2016, with annualized growth rate of +6.5%

investment, respectively. As the marginal buyer of seaborne commodities, China exerts an outsized influence on demand for Australian iron ore, copper, metallurgical coal, alumina, and nickel. Shifts in Chinese demand reliably manifest themselves in the data we track.

Between 2009 and 2011, orders for these raw materials spiked as countercyclical stimulus took Chinese fixed investment from 41% to nearly 50% of GDP. As the stimulus slowed, raw materials orders began fading and reached a trough between the end of 2014 and the middle of 2015 some 45% to 55% below the late-2010 peak (depending on the mine and commodity). As of Q2-2015, portfolio data were consistent with Chinese industrial production growth of just 3.5% in real terms, about half of the rate reported officially. When accounting for the sharp decline in market prices, nominal industrial production appeared to be falling at a -3% annualized rate.

These trends reversed over the second half of 2015. Industrial commodities demand finished the year 10% to 32% stronger than observed at the end of 2014 (again, depending on commodity). By March 2016, implied Chinese industrial production growth exceeded 7%, which was the first time since 2011 that our portfolio-implied measure exceeded official growth estimates. As we observed through other portfolio data, much of the improvement was attributable to increased metals demand from the real estate sector where development spending rebounded following a deep contraction in 2014 and 2015. Strong sales growth caused inventories of residential properties to decline from 20 months of sales in 2014 to just 6.75 months at the end of 2016 (Table 1).

To be clear: growth in China has decelerated sharply since 2011. Commodities demand *Indicators* remain down 32% to 37% from their peaks and implied fixed investment growth is about one-third its 2010 rate. But our data

TABLE 2

Surveys of Economic Forecasters

Data Point	Forecast Consensus (Median)												
	Dec15	Jan16	Feb16	Mar16	Apr16	May16	Jun16	Jul16	Aug16	Sep16	Oct16	Nov16	Dec16
US Gross Trade Volumes / GDP (Source: ECFC)	+1.9%*		+1.6%*		+1.3%*		+1.4%		+1.9%				
US Gross Trade Volumes / GDP (Source: FRB)	+2.6%		+2.5%		+2.5%		+2.4%		+2.3%				
US Real Retail Sales	+4.9%	+3.7%	+1.2%	+0.0%	+2.8%	+4.9%	+4.9%	+3.2%	+1.6%	+3.7%	+4.5%	+6.6%	N/A†
US Energy-Related Industrial*	-26.8%	-29.0%	-23.6%	-26.2%	-25.7%	-29.0%	-24.0%	-23.6%	-24.3%	-22.1%	-20.7%	-19.7%	N/A†
US Business Spending / CapEx	-0.8%	+2.4%	+1.2%	+4.5%	+1.6%	+5.3%	+3.7%	+3.2%	+1.2%	+0.0%	+0.4%	+2.4%	N/A†
US Industrial Production	-1.6%*		-1.6%*		-1.2%		-0.8%		+0.1%				
US Nonresidential Construction	+7.4%	+6.2%	+4.1%	+3.7%	+4.9%	+7.0%	+7.0%	+6.6%	+5.3%	+5.3%	+5.7%	+6.6%	N/A†
US New Auto Sales	18.0M	17.3M	17.7M	17.5M	17.4M	17.3M	17.3M	17.3M	17.2M	17.5M	17.6M	17.7M	17.7M
US Industrial Orders (Ex-Energy)*	-0.2%	+0.6%	+0.9%	+0.4%	+0.2%	+0.0%	+0.5%	+0.1%	-0.4%	+0.0%	+0.1%	+0.4%	N/A†
Euro Area Industrial Production	+0.7%	+1.6%	+1.3%	+0.9%	+1.4%	+1.3%	+0.7%	-0.8%	+1.5%	+0.9%	+0.8%	+1.6%	N/A†
Euro Area Business Volumes / GDP (Source: ECFC)	+2.0%*		+1.7%*		+1.7%*		+1.5%		+1.5%				
Euro Area Business Volumes / GDP (Source: ECB)	+1.7%		+1.8%		+1.7%		+1.7%		+1.6%				
Euro Area Retail Sales	+1.5%	+1.3%	+1.9%	+2.6%	+2.1%	+1.7%	+1.8%	+1.8%	+1.5%	+1.2%	+1.7%	+1.9%	N/A†
Euro Area Industrial Equipment / Manufacturing*	+1.1%	+4.4%	+1.7%	-0.2%	+2.1%	+0.6%	+0.9%	+0.2%	+2.3%	+1.5%	+0.8%	+2.5%	N/A†
German Factory Orders	-1.4%	+0.0%	+2.2%	+0.1%	+0.6%	+0.9%	-1.5%	-0.2%	+1.6%	+3.5%	+1.6%	+3.6%	N/A†
China Industrial Demand (Price Index)	49.8	49.6	49.4	49.4	50.3	50	50	50	49.8	50.5	50.3	51	51.5
China Industry Value Added	+5.7%	+6.0%	+6.0%	+5.9%	+6.5%	+6.0%	+5.9%	+6.2%	+6.2%	+6.4%	+6.2%	+6.1%	N/A†
China Retail Sales	+11.1%	+11.3%	+11.3%	+10.4%	+10.6%	+10.1%	+9.9%	+10.5%	+10.2%	+10.7%	+10.7%	+10.2%	N/A†
China Fixed Investment	+10.1%	+10.2%	+10.2%	+10.4%	+11.0%	+10.5%	+9.4%	+8.9%	+7.9%	+8.2%	+8.2%	+8.3%	+8.3%
Japan Industrial Production	-2.2%*	-2.6%*	-5.6%*	-1.5%*	-1.7%		+0.1%		+1.3%				
Brazil Retail Sales	-7.1%	-8.5%	-5.6%	-4.7%	-6.6%	-6.3%	-6.2%	-5.0%	-5.0%	-5.5%	-8.5%	-5.3%	N/A†

Source: Bloomberg ECOS and ECFC as of December 12, 2016; Federal Reserve Bank of Philadelphia Survey of Professional Forecasters; European Central Bank Survey of Professional Forecasters

*Actual values used as forecasts are not available

suggested that the situation stopped getting worse in late-2015 and actually improved in 2016. This inflection point provided important comfort to our investment professionals given how negative global sentiment towards China had become in the earlier part of last year.

Weakness in Business Spending in Advanced Economies

The slowdown in advanced economies in 2016 was very much concentrated in business spending, particularly equipment used in oil and gas exploration and development. To measure the scale of the impact, we segmented industrial segments exposed to energy capex and found that implied orders in the U.S. fell by nearly 50% since 2014, accounting for most of the observed decline in U.S. business spending. While the U.S. was the epicenter of the collapse, it proved to be a global phenomenon. As we observed through declining orders for precision balls used in excavators and

metallic powder used to manufacture industrial drills, the energy capex bust depressed industrial production in economies with little-to-no domestic oil and gas development, like Germany and Japan.

The weakness in business spending kept U.S. GDP growth a full percentage point below the 2.5% “consensus” expectation for 2016, as we observed through our cargo throughput volumes. Despite this weakness in headline growth, consumer spending remained relatively strong (+2.1%), as we measured through “high-beta” categories like appliances sales and new auto shipments. Growth in household consumption also outpaced overall GDP in Europe, as we observed through discretionary apparel sales in our portfolio and was later confirmed by revised EuroStat data.

FIGURE 2

Quadrant Analysis – Overview

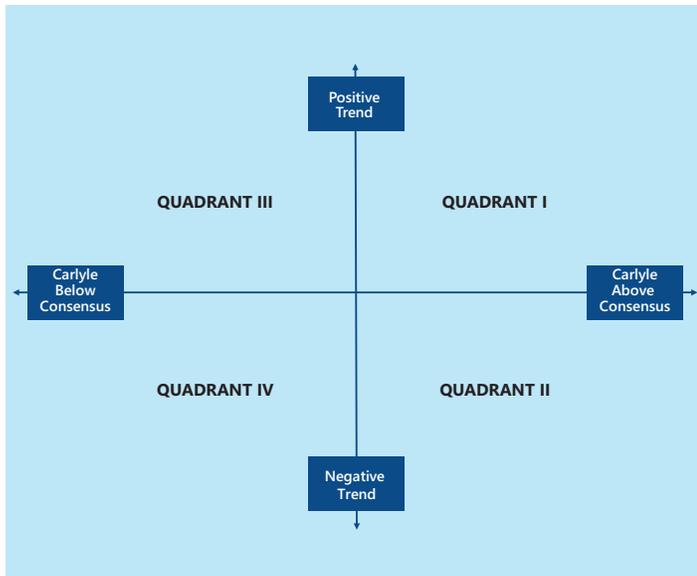


TABLE 3

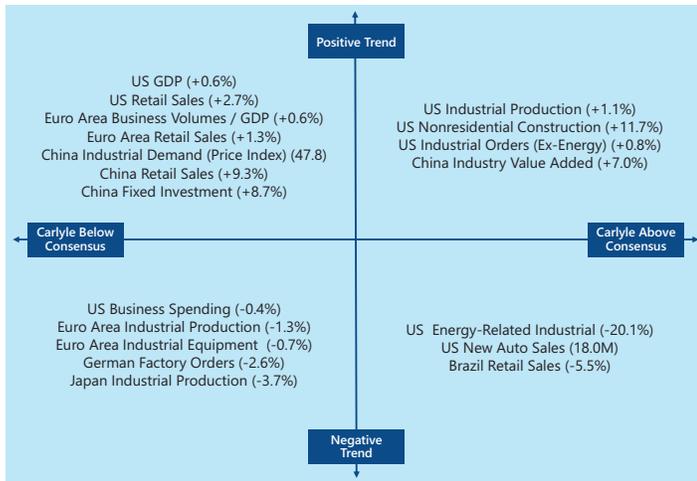
Quadrant Analysis – 2016 Summary

Data Point	Data Quadrant			
	Q1	Q2	Q3	Q4
US Gross Trade Volumes / GDP	III	III	III	III
US Real Retail Sales	III	III	III	III
US Energy-Related Industrial	II	II	II	IV
US Business Spending / CapEx	IV	IV	IV	IV
US Industrial Production	I	I	I	IV
US Nonresidential Construction	I	I	I	III
US New Auto Sales	II	I	I	I
US Industrial Orders (Ex-Energy)	I	III	IV	IV
Euro Area Industrial Production	IV	IV	IV	I
Euro Area Business Volumes / GDP	III	III	III	III
Euro Area Retail Sales	III	III	III	I
Euro Area Industrial Equipment / Manufacturing	IV	I	III	III
German Factory Orders	IV	IV	IV	III
China Industrial Demand (Price Index)	III	III	IV	I
China Industry Value Added	I	I	I	I
China Retail Sales	III	III	III	III
China Fixed Investment	III	III	III	I
Japan Industrial Production	IV	I	II	III
Brazil Retail Sales	II	II	II	II
Mode of Quadrants	III	III	III	III

Source: Carlyle; Bloomberg, As of January 6, 2017

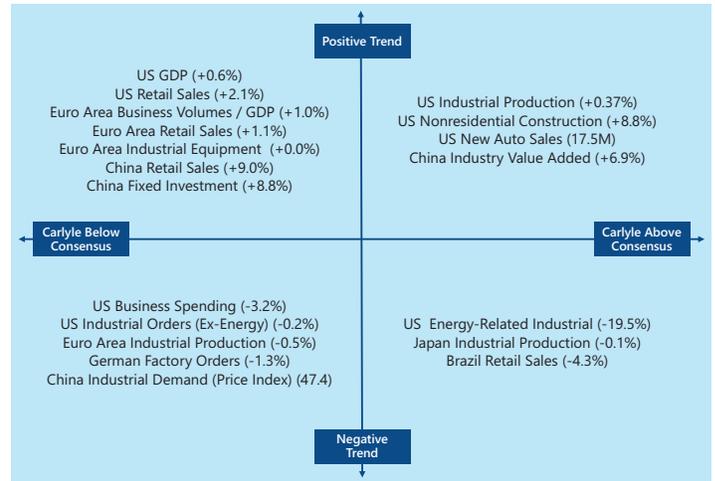
FIGURE 3

Quadrant Analysis – Q1 2016



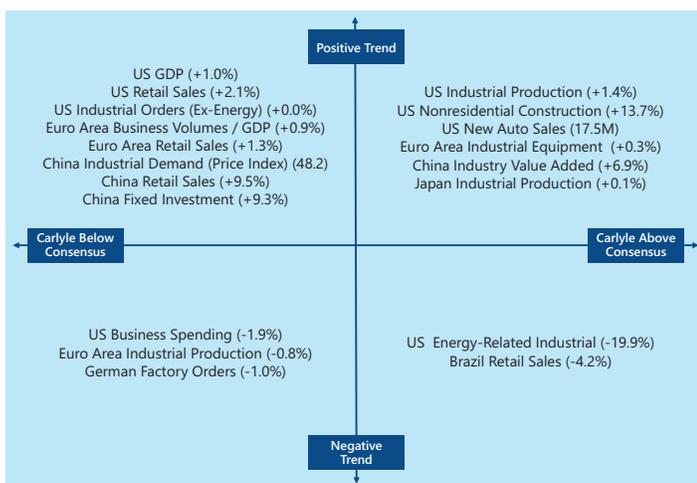
Source: Carlyle; Bloomberg, As of January 6, 2017

Quadrant Analysis – Q3 2016



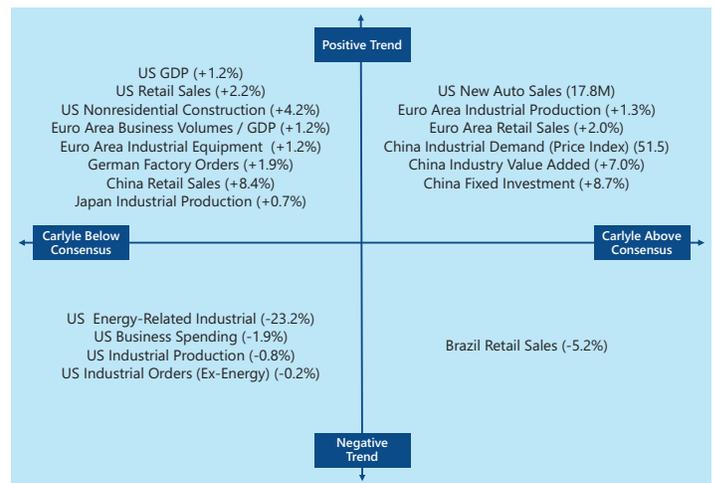
Source: Carlyle; Bloomberg, As of January 6, 2017

Quadrant Analysis – Q2 2016



Source: Carlyle; Bloomberg, As of January 6, 2017

Quadrant Analysis – Q4 2016

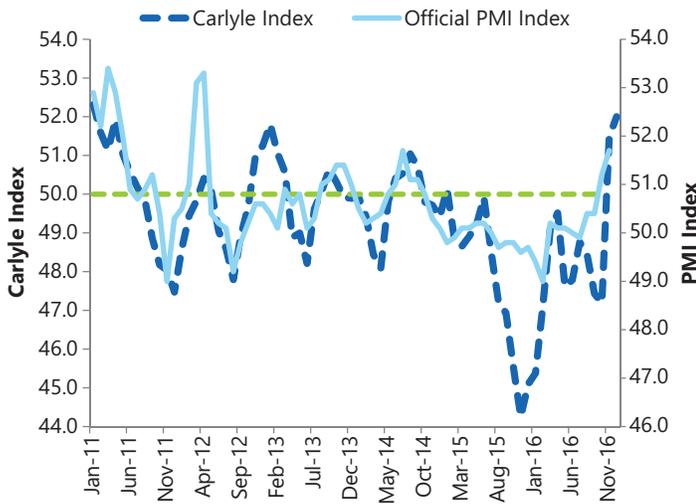


Source: Carlyle; Bloomberg, As of January 6, 2017

Outlook for 2017

Will 2017 be the year of faster real growth and accelerating inflation, as the market repricing after the election seemed to suggest? On the one hand, it seems safe to conclude that headline inflation will rise in 2017 in the U.S. and much of the world. As seen in Figure 4, our price index for Chinese industrial inputs rose steadily over the second half of 2016 and now stands at a level (52.0) consistent with 4% annualized growth in wholesale prices. Given that China accounts for more than 25% of global manufacturing output and is inextricably woven into global value chains, a rise in Chinese producer prices portends a rising price level for the world as a whole.

FIGURE 4
China Industrial Price Index



However, most of the observed price pressure is attributable to the rebound in oil and industrial metals prices. The cost of primary inputs certainly appears to be rising—particularly when measured relative to the lows recorded in early 2016—but there is not much evidence of pricing power for intermediate and finished goods. The domestic U.S. prices of finished manufactured products appear to be increasing at an annual rate of close to 1%, while price increases in other economies appear to be mainly the result of currency depreciation. In Q2-2016, U.S. manufacturers' net income rose by 11% on flat sales thanks to the sharp decline in input prices. There is some concern that the reverse could be true in 2017 if manufacturers cannot pass rising input prices onto endmarket consumers.

The outlook for real growth is somewhat improved, but not (yet?) consistent with the rates implied by the post-election bounce in equity prices. Portfolio-implied GDP growth in the U.S. has risen steadily since September 2016, but remains consistent with sub-2% growth. Household spending continues to look strong, but there's been no clear signal from business order books that the hoped-for acceleration in business spending will materialize. In addition, the observed deceleration in commercial real estate development spending observed in Q4-2016 (see Table 1) raises some questions about the durability of the expansion.

FIGURE 5
Euro Area Manufacturing (Metals & Industrial Engines)

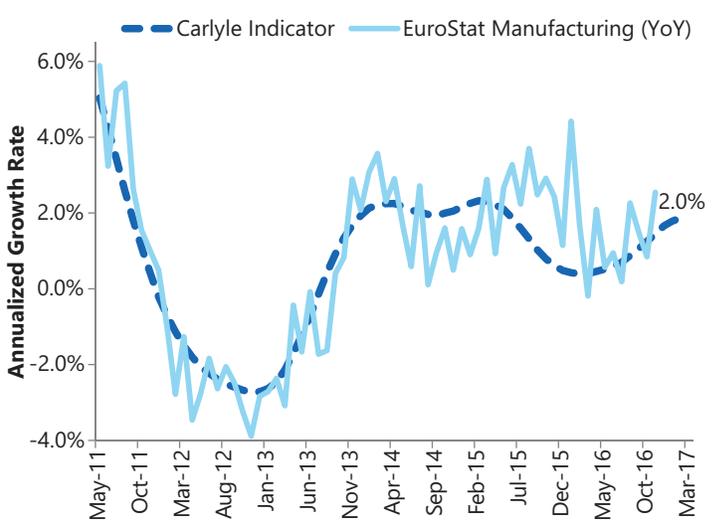
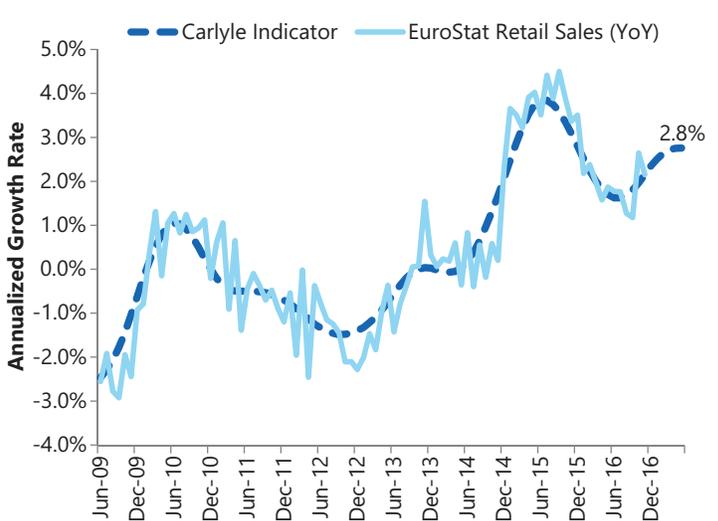


FIGURE 6
Euro Area Retail Sales (Discretionary Apparel Sales)



When measured relative to expectations, the situation looks most promising in Europe, where portfolio data suggest household spending and industrial orders improved markedly at the end of 2016. The expectation of higher rates in the U.S. has contributed to a weaker euro, which has aided competitiveness and corporate profits. More importantly, the rebound in emerging markets demand is clearly manifesting itself in industrial orders, which appear to be growing at a 2% annual rate, up from 0.2% a year ago (Figure 5).

The European economy has grown at a 1% annual rate for so long that many observers wonder whether a faster growth rate is even possible. Yet, the contributions to that 1% growth have shifted markedly over the past few years. Between 2009 and 2014, virtually all of Europe's growth was attributable to external demand, with many export-oriented businesses faring very well despite anemic

domestic growth rates. Both exports and overall manufacturing orders declined steadily over the course of 2015, but GDP continued to grow at a 1% rate thanks to a pick-up in domestic demand. Retail sales growth peaked at nearly 4% in mid-2015 (Figure 6). If political shocks do not intrude, perhaps 2017 will finally be the year that the Euro economy grows at 2%.

Conclusion

After several years of hanging on the every word of central bankers, the game for investors has changed. Growth expectations are once again the main driver of corporate asset prices and it will be the fundamentals that determine whether the recent bout of optimism will prove to be warranted. We believe that there is no better source of information for near-term trends in economic fundamentals than Carlyle's global portfolio of more than 200 operating businesses. We will continue to analyze these data systematically to help determine what looks cheap, what looks expensive, and how we can take better care of our investors' money.

Economic and market views and forecasts reflect our judgment as of the date of this presentation and are subject to change without notice. In particular, forecasts are estimated, based on assumptions, and may change materially as economic and market conditions change. The Carlyle Group has no obligation to provide updates or changes to these forecasts.

Certain information contained herein has been obtained from sources prepared by other parties, which in certain cases have not been updated through the date hereof. While such information is believed to be reliable for the purpose used herein, The Carlyle Group and its affiliates assume no responsibility for the accuracy, completeness or fairness of such information.

References to particular portfolio companies are not intended as, and should not be construed as, recommendations for any particular company, investment, or security. The investments described herein were not made by a single investment fund or other product and do not represent all of the investments purchased or sold by any fund or product.

This material should not be construed as an offer to sell or the solicitation of an offer to buy any security in any jurisdiction where such an offer or solicitation would be illegal. We are not soliciting any action based on this material. It is for the general information of clients of The Carlyle Group. It does not constitute a personal recommendation or take into account the particular investment objectives, financial situations, or needs of individual investors.

William E. Conway, Jr. is a Co-Founder, Co-Chief Executive Officer and Managing Director of The Carlyle Group, a global alternative asset management firm based in Washington, DC.

In addition to serving as Co-Chief Executive Officer, Mr. Conway is Chief Investment Officer with responsibilities for Global Private Equity and Global Market Strategies.

Prior to co-founding Carlyle in 1987, Mr. Conway worked at MCI Communications from 1981 to 1987, serving as Chief Financial Officer from 1984 to 1987. Mr. Conway began his career at The First National Bank of Chicago in 1971 and served for 10 years in a wide variety of positions.

Mr. Conway is a graduate of Dartmouth College and the University of Chicago Graduate School of Business.

Mr. Conway is an active supporter of various local charities, particularly supporting nursing, the needy, and the Catholic Church.

Jason M. Thomas is a Managing Director and the Director of Research at The Carlyle Group, focusing on economic and statistical analysis of the Carlyle portfolio, asset prices, and broader trends in the global economy. He is based in Washington, D.C.

Mr. Thomas serves as the economic adviser to the firm's corporate private equity and real estate investment committees. His research helps to identify new investment opportunities, advance strategic initiatives and corporate development, and support Carlyle investors. Previous to joining Carlyle, Mr. Thomas was Vice President, Research at the Private Equity Council. Prior to that, he served on the White House staff as Special Assistant to the President and Director for Policy Development at the National Economic Council. In this capacity, he served as the primary adviser to the President for public finance.

Mr. Thomas received a B.A. from Claremont McKenna College and an M.S. and Ph.D. in finance from George Washington University where he studied as a Bank of America Foundation, Leo and Lillian Goodwin Foundation, and School of Business Fellow.

He has earned the Chartered Financial Analyst (CFA) designation and is a financial risk manager (FRM) certified by the Global Association of Risk Professionals.

Contact Information

Jason Thomas

Director of Research

jason.thomas@carlyle.com

(202) 729-5420

THE CARLYLE GROUP

GLOBAL ALTERNATIVE ASSET MANAGEMENT