New Regimes for a Changed World 5.1

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“For the first time in a decade, the world’s major economies are growing in sync, a result of low-interest rate stimulus from central banks and the gradual fading of crises that over the years ricocheted from the U.S. to Greece, Brazil and beyond. …It’s not a particularly fast or thrilling beat, more plodding and methodical, but it’s getting the job done…”

Josh Zumbrum
The Wall Street Journal
August 24, 2017
World economy remains in solid recovery mode…

**World macro growth breadth index**
Ongoing improvement of global macro data flow...

**Developed and emerging market breadth indexes**
..driven by industrialized and emerging countries

Note: The world macro breadth indices track the direction of 226 global, regional and country macro data (173 growth and 53 inflation indicators) on a monthly basis. The monthly change of the index is scaled from -1 to 1, with a value of 1 (-1) implying an increase (decrease) of all underlying data.

Growth in the US economy continues – it’s not pretty, but it is steady

Real GDP and manufacturing PMIs

Average hourly wages

Chart on left source: ISM; Markit; US Bureau of Economic Analysis; Allianz Global Investors. As of July 31, 2017.
US growth rates approximate potential, so no recession is in sight

Actual and potential GDP growth

Index of leading economic indicators

Past performance is not a reliable indicator of future results. It is not possible to invest directly in an index. Forecasts are not a reliable indicator of future results.

The US labor market remains robust

Initial claims for unemployment insurance

Labor force participation rate and the share of the population with a job

Workers finding jobs easier to get
Employers finding qualified workers harder to get

Small company and workers survey results

National Federation of Independent Business Employment Survey
Mysteriously muted US and global inflation

US inflation measured by the CPI

Approximate global core inflation rates

Chart on right source: DataStream; Allianz Global Investors. As of July 31, 2017.
Why have wages stagnated while the US labor market remains tight?

The strong positive correlation between job availability and wage growth has broken down

Fixed-income markets do not expect inflation to accelerate

The US 5 year/5 year forward inflation rate

TIPS breakeven compensation

Chart on right source: FactSet; Allianz Global Investors. As of August 11, 2017.
Monetary policy remains historically accommodative

US real effective federal funds rate

Cumulative asset purchases by major central banks

Chart on right source: DataStream; Allianz Global Investors. As of July 31, 2017.
I don’t think it’s possible for the Fed to end easy-money policies in a trouble-free manner. Recent episodes in which Fed officials hinted at a shift toward higher interest rates have unleashed significant volatility in markets, so there is no reason to suspect that the actual process of boosting rates would be any different.

Alan Greenspan
US: Normalizing monetary policy requires persistent reductions in asset holdings

**Holdings by major asset class**
Scaling down the portfolio will reshape securities markets

**SOMA maturity distribution by year is front-loaded**
Proposed caps on securities rolling off should mitigate market impacts

Forecasts are not a reliable indicator of future results.
How Fed balance sheet reduction could impact US monetary policy

**Hypothetical Fed balance sheet scenario**

KC Fed research suggests that reducing the balance sheet by $675B over 2 years might be equivalent to one 25bp rate hike.

**Balance sheet effects on the term premium**

Not reinvesting in Treasuries will raise term premiums and yields.

Forecasts are not a reliable indicator of future results.

Chart on left source: Kansas City Federal Reserve; Allianz Global Investors. As of May 10, 2017.

Chart on right source: Kansas City Federal Reserve; Allianz Global Investors. As of August 20, 2017.
Money in the pocket makes consumers confident

US M-2 money supply growth

Consumer confidence

Credit is the vital air of the system of modern commerce. It has done more, a thousand times, to enrich nations, than all the mines of all the world. It has excited labor, stimulated manufacturers, pushed commerce over every sea, and brought every nation, every kingdom, and every small tribe, to be known to all the rest. It has raised armies, equipped navies, and triumphing over the gross power of mere numbers, it has established national superiority on the foundation of intelligence, wealth, and well-directed industry. Credit is to money what money is to articles of merchandise.

Senator Daniel Webster, 1834
Low mortgage rates accommodate a gradual housing recovery

30-year fixed mortgage rate

Housing starts and homebuilder confidence

Chart on left source: FactSet; Allianz Global Investors. As of August 4, 2017.
Chart on right source: FactSet; Allianz Global Investors. As of July 31, 2016.
The majority of our imports come from outside the country.

George W. Bush
Depreciated US dollar supports commodity prices

Trade-weighted US dollar against major currencies

Bloomberg Commodity Index vs. US dollar

US oil production is a wild card in real and financial markets

**US oil production and oil rig count**

**US high-yield spread vs. oil price**

Chart on left source: FactSet; Allianz Global Investors. As of August 11, 2017.
Chart on right source: FactSet; Bank of America Merrill Lynch; Allianz Global Investors. As of August 11, 2017.
We have every reason to say, and I note this with great satisfaction, that a truly friendly relationship has evolved with China, and in many key areas of these relations, without any exaggeration, have a strategic character. As we say, [this is] the strategic character of [a] privileged partnership.

Vladimir Putin
Moderation in Chinese growth is likely as government focuses on reducing long-term financial risks

Nominal GDP growth and real estate investment
Slowing investment in real property likely will dampen real GDP growth

Financial and real estate sectors as % of GDP
Both sectors comprise larger and larger shares of GDP

While the BoJ will continue expanding its balance sheet, the PBoC likely will keep liquidity conditions stable.

Bank of Japan asset purchases

People's Bank of China asset holdings

All successful revolutions are the kicking in of a rotten door.

John Kenneth Galbraith
De-globalization exacerbates the supply-side constraints due to weak productivity growth and unfavorable demographics

Rising inequality since the early 1980s within countries helps explain the rise in support for populist parties.

**Gini coefficient (in %): US, UK, Germany**

* GINI coefficient is a measurement of the degree to which actual income distribution deviates from perfect equality.

**Share of European population expressing confidence**
Unfavorable demographics and weak productivity growth contribute to structurally low-growth economies.
“Everything that can be invented already has been.”

Larry Ellison (1977)
Former CEO and Co-Founder of Oracle
Technological change may yet be the biggest driver of productivity

The 6 D’s of technological change may yet become the biggest drivers of productivity

- Deception
- Democratization
- Digitalization
- Dematerialization
- Demonetization
- Disruption

Technologies and their interfaces will be fused across physical, digital and biological domains in:

- Smart and connected machines and systems
- Quasi-artificial intelligence
- Quantum computing
- 3-D printing
- System robots
- Big data
- Medical imaging
- Gene splicing and genomics
- Nanotechnologies
- Virtual reality
- Machine learning
“Dear iPhone,

A decade ago, Steve Jobs said that you were ‘three revolutionary products’ in one. He was wrong. You’ve already displaced so many more: alarm clocks, guitar tuners, product calculators, atlases, Filofaxes, dictaphones and weathermen…

But you’re no ‘product’ at all: You’re a life partner. You’re the first thing I look at in the morning and the last thing I look at before I sleep. There’s no turning you off.

Geoffrey A. Fowler
Wall Street Journal
June 22, 2017
Innovations like 3-D printing disrupt industries and distort measurements of economic growth and productivity

### Industries being disrupted by 3-D printing

*Future applications of 3-D printing will revolutionize production*

<table>
<thead>
<tr>
<th>Industries</th>
<th>Current Applications</th>
<th>Potential Applications</th>
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<tbody>
<tr>
<td>Commercial aerospace and defense</td>
<td>Concept modeling and prototyping</td>
<td>Embedding additively manufactured electronics directly onto parts</td>
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<td>Structural and non-structural production parts</td>
<td>Complex engine parts</td>
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<td>Low volume replacement parts</td>
<td>Aircraft wing components</td>
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<td>Other structural aircraft components</td>
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<td>Space</td>
<td>Specialized parts for space exploration</td>
<td>On-demand parts and spares in space</td>
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<td>Structures using light-weight, high-strength materials</td>
<td>Large structures created directly in space, circumventing launch vehicle size limitations</td>
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<tr>
<td>Automotive</td>
<td>Rapid prototyping and manufacturing of end-use parts</td>
<td>Sophisticated auto components</td>
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<td>Parts and assemblies for antique cars and race cars</td>
<td>Auto components designed through crowdsourcing</td>
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<td>Quick production of parts or entire vehicles</td>
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<tr>
<td>Health care</td>
<td>Prostheses and implants</td>
<td>Developing organs for transplants</td>
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<td></td>
<td>Medical instruments and models</td>
<td>Large-scale pharmaceutical production</td>
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<tr>
<td></td>
<td>Hearing aids and dental implants</td>
<td>Developing human tissues for regenerative therapies</td>
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<tr>
<td>Consumer products/Retail</td>
<td>Rapid prototyping</td>
<td>Co-designing and creating with customers</td>
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<td>Creating and testing design iterations</td>
<td>Customized living spaces</td>
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<td>Customized jewelry and watches</td>
<td>Growing mass customization of consumer products</td>
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<td>Limited product customization</td>
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Innovations in photographic technology occur so fast that they often are deceptive.

**Number of photos taken by decade**

Digital cameras enabled explosive growth in photos taken.

![Bar chart showing the number of photos taken by decade](chart)

Source: [www.digital-photography-school.com/history-photography](http://www.digital-photography-school.com/history-photography);
Regulations have expanded over the long-run, but less so recently

Removal of liquidity can restrain multiples and aggravate VIX

Fed balance sheet size since 2010 vs. VIX

Are investors over-paying for risk?

S&P 500 Forward P/E vs. VIX Index
Equity valuations became very stretched
Equity valuations are soaring, but volatility is not.
With US valuations stretched, Fed balance sheet reduction may be a steady, but moderate, headwind for multiples.

S&P 500 cyclically adjusted P/E ratio
(Price/10-year average earnings)

Fed balance sheet size vs. S&P 500 cyclically adjusted P/E ratio

Chart on right source: Thomson Reuters Datastream; Allianz Global Investors. As of July 14, 2017.
Equity markets tend to move in sideways range when commodity prices rise (and vice versa)

Source: Thomson Reuters Datastream; Allianz Global Investors. As of July 14, 2017
Last five years’ equity returns under-perform typical end-of-cycle rally

S&P 500 Rolling annualized total returns (December 1930 – July 2017)

- Bull market peaks (median) (21.4%)
- As of July 31, 2017 (14.8%)
- Median (10.8%)
- Quintile 1 (Highest)
- Quintile 2
- Quintile 3
- Quintile 4
- Quintile 5 (Lowest)

Source: Factset; Richard Bernstein Advisors; Allianz Global Investors. As of July 31, 2017.
Companies have levered-up (risky), but yields have compressed.
US Treasuries: Yield curve offers insufficient protection for expected rise in interest rates


<table>
<thead>
<tr>
<th></th>
<th>1m</th>
<th>0-3m</th>
<th>3-6m</th>
<th>6-9m</th>
<th>9-12m</th>
<th>1-3y</th>
<th>3-5y</th>
<th>5-7y</th>
<th>7-10y</th>
<th>10y+</th>
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<tbody>
<tr>
<td>Arithmetic mean</td>
<td>4.33</td>
<td>4.58</td>
<td>4.98</td>
<td>5.20</td>
<td>5.27</td>
<td>5.54</td>
<td>6.02</td>
<td>6.33</td>
<td>6.35</td>
<td>6.67</td>
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<td>Geometric mean</td>
<td>4.32</td>
<td>4.57</td>
<td>4.97</td>
<td>5.19</td>
<td>5.26</td>
<td>5.52</td>
<td>5.92</td>
<td>6.18</td>
<td>6.15</td>
<td>6.27</td>
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<tr>
<td>Return volatility</td>
<td>0.78</td>
<td>0.83</td>
<td>0.99</td>
<td>1.24</td>
<td>1.46</td>
<td>2.53</td>
<td>4.28</td>
<td>5.38</td>
<td>6.63</td>
<td>9.35</td>
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<tr>
<td>Mean excess return</td>
<td>0.00</td>
<td>0.25</td>
<td>0.65</td>
<td>0.86</td>
<td>0.95</td>
<td>1.23</td>
<td>1.69</td>
<td>2.00</td>
<td>2.04</td>
<td>2.35</td>
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<tr>
<td>Excess return volatility</td>
<td>0.00</td>
<td>0.17</td>
<td>0.52</td>
<td>0.89</td>
<td>1.18</td>
<td>2.38</td>
<td>4.20</td>
<td>5.32</td>
<td>6.58</td>
<td>9.33</td>
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<tr>
<td>Sharpe ratio</td>
<td>NA</td>
<td>1.48</td>
<td>1.24</td>
<td>0.99</td>
<td>0.80</td>
<td>0.52</td>
<td>0.40</td>
<td>0.38</td>
<td>0.31</td>
<td>0.25</td>
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<tr>
<td>Mean duration (approx.)</td>
<td>0.10</td>
<td>0.10</td>
<td>0.39</td>
<td>0.60</td>
<td>0.80</td>
<td>1.63</td>
<td>3.53</td>
<td>4.87</td>
<td>6.14</td>
<td>10.54</td>
</tr>
</tbody>
</table>

Source: DataStream; Allianz Global Investors. As of August 14, 2017.

US Treasuries: Historical vs horizon excess risk/return

Source: DataStream; Allianz Global Investors. As of August 14, 2017.
Treasury yields remain at historic low levels as yield curve flattening generally persists

Regular crises perpetuate the past by reinvigorating cycles which started long ago. In contrast CRISES are the past’s death knell. They function like laboratories in which the future is incubated….Once they strike, the past ceases to be a reliable predictor of the future and a brave new world is born.

Yanis Varoufakis
The four most dangerous words in investing are ‘this time is different’

Sir John Templeton
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