The Weekly Letter

Chief Investment Office • FEBRUARY 2, 2016

- **The Fourth Industrial Revolution:** At this year's World Economic Forum annual meeting, the so-called Fourth Industrial Revolution was highlighted as a major theme that will characterize the years ahead. This revolution, according to the meeting's attending business and government leaders, will consist of technological developments that will change our lives, business, markets and the global economy. With this forecast as a backdrop, we remind investors of the importance of long-term investment plans and of the relevance of A Transforming World themes, particularly in times of market volatility.
- **Markets in Review:** Last week equities rose, with the S&P 500 up 1.8%, while international equities, as represented by the MSCI EAFE Index, rose 1.5%. Bond yields were lower on the week, with the 10-year Treasury yield at 1.93%, versus 2.05% in the prior week. Commodities overall, as measured by the Bloomberg Commodity Index, rose 2.6% last week, while WTI crude oil rose 4.4%, to $33.6 per barrel, and gold rose 1.8%, to $1,118.2 per ounce.
- **Looking Ahead:** In the U.S., the ISM Non-Manufacturing Index is expected to taper slightly and employment growth is expected to slow in January. In the eurozone, retail sales growth is expected to slow and the Bank of England is expected to leave its policy rate unchanged.

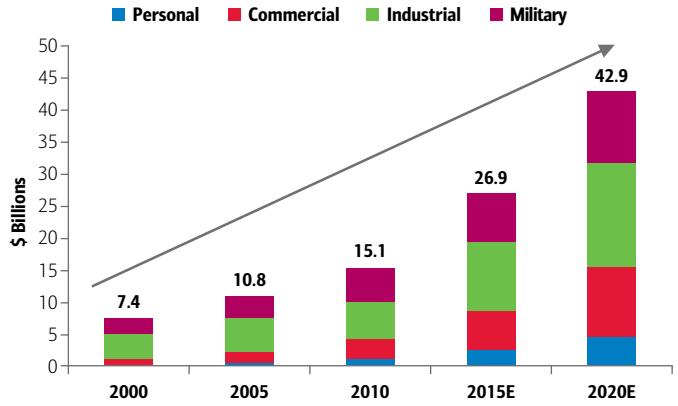
The Fourth Industrial Revolution

The World Economic Forum (WEF) annual meeting, which took place in Davos, Switzerland last month, highlighted the so-called Fourth Industrial Revolution as one of the most groundbreaking themes we will be seeing in the years to come. There was a very strong sense among the meeting's attending business and government leaders that society is on the cusp of technological developments that will fundamentally change the way we live and will transform business, markets and the global economy.

Industrial revolutions

During the first industrial revolution, water and steam power was used to mechanize production and equipment. During the second, electric power was used to achieve mass production and division of labor. During the third, electronic and information technology was used to automate production, paving the way for greater economies of scale, according to Klaus Schwab, Founder and Executive Chairman of the World Economic Forum.

Exhibit 1: Significant Increase in the Global Robotics Market



Source: BofA Merrill Lynch Global Research and Chief Investment Office.
Note: There can be no assurance that the trends described here will continue or that the forecasts will come to pass.

The McKinsey Global Institute frames the Fourth Industrial Revolution as the age of "cyber-physical systems"—systems that integrate computation, networking and physical processes[1]. These include a myriad of technologies that span themes such as mobile devices, the Internet of Things, artificial intelligence (AI), robotics (see Exhibit 1), cybersecurity and 3D printing. This revolution will bring benefits and challenges for businesses

[1] McKinsey Global Institute, "Disruptive technologies: Advances that will transform life, business, and the global economy," May 2013.

and societies at large, and is distinct from the prior revolutions, given how fast it is penetrating the infrastructure of businesses and governments. The new technologies have the potential to aid global economic growth through increased productivity. Economists are trying to better understand how to measure the technologies' productivity impact and how the economy adapts to enable them to realize their potential.

Greater consumer welfare and efficiency...

We find it intriguing how mobile devices on a daily basis connect billions of people globally with unparalleled access to information as these devices continuously improve processing power and storage capacity. Such technologies have enhanced consumer welfare by providing access to goods and services more cheaply, faster and with more convenience—think e-books, Uber cabs, social media, etc. Their impact has been to transfer enormous amounts of value-add to consumers, freeing up their buying power for other goods and services, while squeezing the profit margins of disrupted industry incumbents.

For businesses, according to BofA Merrill Lynch (BofAML) Global Research, the related market opportunities are impressive. For example, for the **Internet-of-Things**[2], the market opportunity is expected to be worth $7 trillion by 2020. And, according to Cisco, the number of connected devices will double from 25 billion in 2015 to an estimated 50 billion in 2020. Likewise, annual data traffic is expected to see a compounded annual growth rate (CAGR) of 40% from 1.2 zeta byte in 2012 to an estimated 100 zeta byte by 2020, according to Frost & Sullivan. The Internet-of-Things ecosystem, as well as the Cloud and Big Data analytics, are key enablers for robotics and automation.

Robotics is another area that is fast changing industries such as manufacturing and health care. In the past 10 years, the number of global industrial robots has grown 72%, while the number of U.S. manufacturing jobs has fallen 16%, according to BofAML Global Research. Health care is another promising area for robotics, where it can help improve patients' quality of life, while reducing costs for providers and insurers. Minimally invasive robotic heart surgery, for example, has reduced recovery time, pain and other aspects of patients' experience, and has shortened required hospital stays, needed medications, and other adverse effects compared to traditional heart surgery. The robotics technology market is expected to grow 9-11% by 2020, with global spending on robotics reaching $43 billion by then (see Exhibit 1 again).

...but challenges for labor

Many predict that the Fourth Industrial Revolution will be adverse for employment, unlike the previous industrial revolutions, in which the jobs created thanks to the new technologies far outweighed those lost in the disrupted sectors.

According to WEF research[3], over five million jobs could be lost by 2020 as a result of developments in genetics, AI, robotics and other technological changes. Office jobs are expected to account for two-thirds of the job losses, while computer-, mathematical-, architecture- and engineering-related jobs are likely to surge.

In his book "Rise of the Robots," entrepreneur Martin Ford paints a grim picture of employment in the new era, as intelligent robots that take care of themselves displace whole classes of workers. Further, MIT professor Erik Brynjolfsson, in his book "The Second Machine Age," predicts that technological progress will leave a lot of people behind and that there has never been a better time for workers to acquire special skills or education to be able to use technology to create and capture value. However, automation can be a gift to economies with a labor force facing challenges due to poor demographics, such as China, Japan and Germany.

Retraining and educating today's workers will thus be crucial in preventing skill mismatch, mass unemployment and growing inequality. In particular, we anticipate significant challenges for Emerging Markets, as the march of robots may truncate traditional manufacturing-led countries like China. At the same time, India may find it challenging to emerge as a massive manufacturing powerhouse employing loads of people because robots will replace labor, which is already happening. Finally, state-owned enterprises and government agencies will depend on the ability of government systems and public authorities to adapt swiftly.

Portfolio Strategy: Within Disruptive Technologies, we see attractive growth potential in companies with innovative, low-cost, secure and disruptive products. These include cybersecurity, cloud storage facilities, online consumer services and mobile payment solutions. In the Internet-of-Things segment, we would look for companies in the business of developing smart homes, integrated workplaces and mobile marketing.

[2] The network of objects, devices, vehicles, buildings and other items embedded with electronics, software, sensors, and network connectivity, enabling these objects to collect and exchange data.

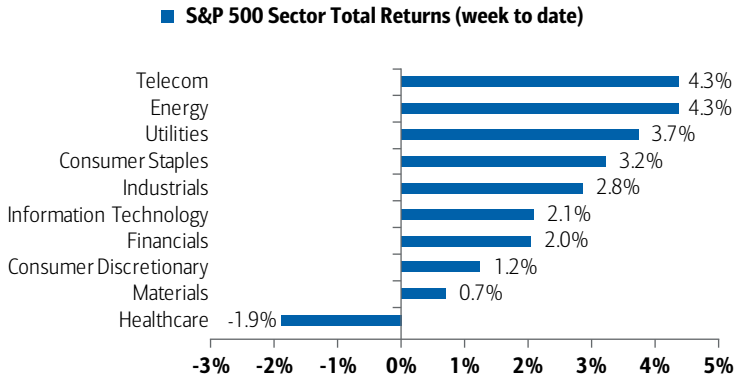
[3] "Rise of the Robots Will Eliminate More Than 5 Million Jobs," Bloomberg Business article, January 27, 2016.

Markets in Review

Trailing Economic Releases

- Real gross domestic product growth tapered to a seasonally adjusted 0.7% quarter-over-quarter (QoQ) in the fourth quarter of 2015, from 2.0% in the third quarter. Structures and equipment investment was weak, but residential investment was robust.
- The Employment Cost Index grew 0.6% QoQ in the fourth quarter. This pace is consistent with improvements in the payrolls earnings data.
- Eurozone headline and core inflation came in at 0.4% year-over-year (YoY) and 1.0% YoY, respectively, for January. The eurozone's M3 money supply growth declined to 4.7% YoY in December, from 5.1% (5.0% revised) in November.

S&P 500 Sector Total Returns (as of last Friday's market close)



Equities

	Level	Total Return in USD (%) WTD	MTD	YTD
DJIA	33,801.7	2.3	-5.4	-5.4
NASDAQ	5,183.1	0.5	-7.8	-7.8
S&P 500	3,632.0	1.8	-5.0	-5.0
S&P 400 Mid Cap	1,889.8	2.4	-5.7	-5.7
Russell 2000	4,954.0	1.5	-8.8	-8.8
MSCI World	4,235.7	1.7	-6.0	-6.0
MSCI EAFE	4,480.1	1.5	-7.2	-7.2
MSCI Emerging Mkts	319.5	4.5	-6.5	-6.5

Fixed Income

	Yield (%)	Total Return in USD (%) WTD	MTD	YTD
ML US Broad Market	2.25	0.5	1.4	1.4
ML 10-Year US Treasury	1.93	1.1	3.2	3.2
ML US Muni Master	2.10	0.2	1.1	1.1
ML US IG Corp Master	3.61	0.3	0.4	0.4
ML US HY Corp Master	9.16	1.1	-1.6	-1.6

Commodities & Currencies

	Level	Total Return in USD (%) WTD	MTD	YTD
Bloomberg Commodity	155.7	2.6	-1.7	-1.7
WTI Crude $/Barrel[1]	33.6	4.4	-9.2	-9.2
Gold Spot[1]	1,118.2	1.8	5.3	5.3
Level	**Current**	**Prior Week End**	**Prior Month End**	**2015 Year End**
EUR/USD	1.1	0.3	-0.3	-0.3
USD/JPY	121.1	2.0	0.8	0.8

Source: Bloomberg.[1] Spot price returns. All data as of last Friday's close.
Past performance is no guarantee of future results.

Looking Ahead

In the U.S., the ISM Non-Manufacturing Index is expected to taper slightly and employment growth is expected to slow in January. In the eurozone, retail sales growth is expected to slow and the Bank of England is expected to leave its policy rate unchanged.

Upcoming Economic Release

- On Wednesday, the ISM Non-Manufacturing Index is expected to taper slightly, to 55.0, in January, from 55.3 in December. This would be consistent with solid growth in the services sector.
- On Friday, employment growth is expected to slow in January, with nonfarm payrolls rising by 170,000. This follows a solid 2015 finish, as jobs increased by an average of 284,000 per month in the final quarter of the year.
- Also on Wednesday, eurozone retail sales growth is expected to slow to 1.3% YoY for December, from 1.4% YoY in November.
- On Thursday, the Bank of England is expected to leave its policy rate unchanged, at 0.5%.

BofA Merrill Lynch Global Research Key Year-End Forecasts

S&P Outlook	**2016 E**
Target	2,200
EPS	$125.00
Real Gross Domestic Product	**2016 E**
Global	3.3%
U.S.	2.1%
Euro Area	1.5%
Emerging Markets	4.2%
U.S. Interest Rates	**2016 E**
Fed Funds	1.13%
10-Year T-Note	2.65%
Commodities	**2016 E**
WTI Crude Oil	$45.00
Gold	1,088

All data as of last Friday's close.

CHIEF INVESTMENT OFFICE

Christopher Hyzy
Chief Investment Officer
Bank of America Global Wealth & Investment Management

Christopher J. Wolfe
Head of the Merrill Lynch Chief Investment Office

Mary Ann Bartels
Head of Merrill Lynch Wealth Management Portfolio Strategy

Karin Kimbrough
Head of Macro and Economic Policy

Maxwell Gold
Vice President

Emmanuel D. "Manos" Hatzakis
Director

Jon Lieberkind
Vice President

Niladri "Neel" Mukherjee
Managing Director

John Veit
Vice President

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