CHIEF INVESTMENT OFFICE

The Weekly Letter

OCTOBER 10, 2017

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Head of Market & Thematic Strategy

→ [illegible]: Even if well-versed in Japan's demographic challenge, many investors may be less cognizant of the nation's response to it. We believe Japan is in the midst of a robotics revolution that could transform not only factories but schools, hospitals, nursing homes, airports, train stations, space stations and even temples, and potentially be replicated around the world—in some shape or form—given how populations are also aging in Europe, the U.S. and even China.

→ M[illegible]: Last week equities were mixed, with the S&P 500 up 1.3% and international equities, as measured by the MSCI EAFE Index, down 0.1%. Bond prices were little changed, with the yield on the 10-year Treasury up 3 basis points to 2.36% from 2.33% the prior week. Commodities as measured by the Bloomberg Commodity Index dropped 0.6%, although WTI crude oil fell back 4.6% to $49.29 per barrel. Gold edged down 0.3% to $1,276.60 per ounce.

→ [illegible] A[illegible]: Next week investors will analyze the minutes of September's Federal Reserve meeting in addition to fresh inflation data to help decipher the likelihood of a rate hike in December. We anticipate the Eurozone will offer more insight into the bloc's industrial activity.

Japan's Robotics Revolution*

Due largely to an aging population, no country has had more obituaries written about it than Japan. In the hierarchy of economic geriatrics, Japan stands at the apex. Out of a population of roughly 127 million people, more than a quarter are seniors—65 or older. The median age was 47 in 2016, up from 37 in 1990 and well above the global median age of 30. The number of births in the nation hit the lowest level on record in 2016, which signifies that the trend is unlikely to reverse anytime soon.

Indeed, according to estimates from Japan's Health Ministry, the nation's population is on course to shrink by one-third by 2065. By then, nearly 40% of the population will be 65 years or older. Little wonder that delivering eulogies about Japan appears to be nearly as commonplace as a Google search.

The oft-repeated refrain—the sun has set on Japan—speaks to the nation's diminished global economic influence and the concomitant rise of China and, lately, India. The future of Asia, and the global economy, according to consensus, is likely to pivot on Asia's twin giants, leaving Japan lagging behind, more or less becoming an economic invalid.

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Even if well-versed in Japan's demographics, many investors may be less cognizant of the nation's response to this challenge. Simply put, we believe Japan is in the midst of a robotics revolution that could transform nearly every aspect of Japanese society and potentially be replicated around the world—in some shape or form—given the aging populations of Europe, the U.S. and even China.

Far from lagging, Japan is leading the way in a world confronting declining birth rates and aging societies, and the knock-on effects of a dwindling labor force, acute labor shortages and soaring costs for elder care. Out of necessity, Japan has been pushing on the robotics frontier for years; as a result, the proliferation and embrace of robots goes well beyond the Japanese factory floor and extends to schools, hospitals, nursing homes, airports, train stations, space stations and even temples.

"Pepper," Softbank Group's humanoid robot, now leads exercises and recreational activities with seniors in various care-giving facilities across the country. A jack of all trades, Pepper is being used in banks, sushi shops and now funeral homes. For a cheaper price than a Buddhist priest, Pepper, clad in a Buddhist robe, has been programmed to recite sutras from four major Japanese Buddhist sects, helping to defray the cost of funerals in Japan.

* A longer version of this article appeared in U.S. Trust's Weekly Capital Market Outlook on September 18, 2017 titled: "Japan is the future, not the past."

"Robear" is another fixture for Japanese nursing homes, and is described as a "strong robot with a gentle touch," capable of carrying elderly Japanese to and from the bathroom, or gently placing them in wheelchairs. "Paro" is a miniature robotic plush seal that engages the elderly in an effort to ward off dementia.

Then there is "Vevo"—a bear-shaped robot that greets and identifies children in day care centers. While the toddlers nap, "Vevo" takes the kids' heart rates and monitors body movements to make sure everyone is well. "Vevo" has been critical in filling vacancies of nursery school teachers in Japan, where nationally the jobs-to-applicants ratio stood at 2.17 in July. "Meebo," meanwhile, is a kindergarten robot that dances with children. Toyota's "Kirobo Mini," is a robot designed to provide companionship to childless women in Japan.

For Japanese households in fear of foul odors, there is "Hana-chan"—a robot mutt that barks if it detects smelly feet—a notable offence in Japan where shoes are customarily removed before entering a home. The robot dog is equipped with an odor detection sensor and can spray air freshener if needed.

On it goes. Some robotic tasks seem frivolous and are in the early stages of development, but we do not believe that any other country has strategically embraced robots as much as Japan, with its revised Japan Revitalization Strategy seeking to achieve "a new industrial revolution driven by robots."

Pointing to the upside for robots for medical and nursing-care services, the Japanese government expects the market to expand from 19.1 billion yen ($166 million) in 2015 to 391 billion yen by 2025, a 20-fold increase.

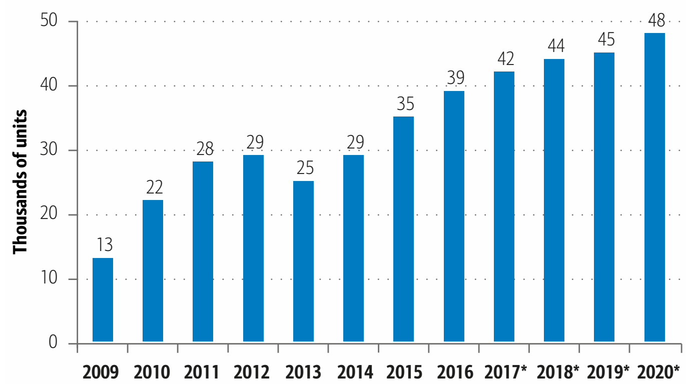
Manufacturing and deploying robots in Japan is hardly new, however. Industrial robot sales there rose to 39,000 last year, up from just 13,000 in the recession-year 2009. Sales are on pace to hit 44,000 next year, according to the International Federation of Robotics (see Exhibit 1). The bulk of these robots are expected to be in the automotive and electronics sector.

Unbeknownst to many investors, Japan has stolen a march on the future, with both Europe and the U.S. increasingly confronting the same problems Japan has been dealing with for decades—rapidly aging populations, a spiraling number of elderly and a shrinking labor force. Add in stricter U.S. immigration controls, and the demand for "Pepper" and company looks increasingly essential if the U.S. economy is to continue to grow and prosper.

It's a similar story across aging and anti-immigration Europe, as well as China, where the mainland's labor force has peaked and the number of elderly has soared over the past decade.

Given America's lukewarm embrace of robotics, notably in service activities, there is no pure investment play on U.S.

Exhibit 1: Sales of industrial robots are on the rise

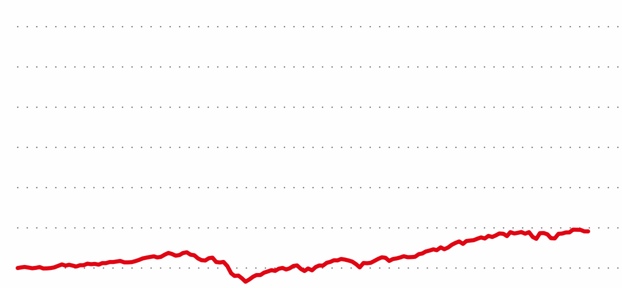


*Forecast.
Source: International Federation of Robotics. Data as of September 14, 2017

industrial robotics manufacturers. The market vanguard: the Germans, the Swiss, and lately China, but also Japan. Japanese manufacturers and component suppliers are considered among the best in the world, and sell both finished robots and components not only in Japan but all over the world.

C: With Japan in the lead, we remain bullish on our robotics theme, believing that despite elevated valuations in some stocks, the group as a whole remains attractive. We believe this powerful secular theme is in the early innings, nothwithstanding the stunning outperformance of the Global Robotics and Automation Index and the ROBO Japan Index (see Exhibit 2).

Exhibit 2: The robotics industry has been outperforming



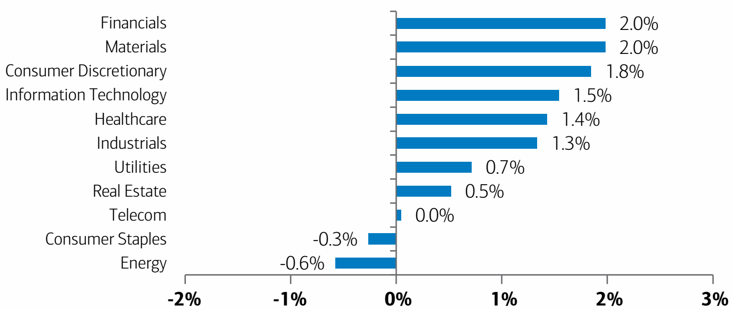
Markets in Review

Vice President

Trailing Economic Releases

- The U.S. Department of Labor reported that non-farm payrolls declined by 33,000 in September, with the effects of Hurricanes Irma and Harvey weighing heavily on the outcome, while average hourly earnings popped up 0.5%. Underlying data suggested that wage growth may be persistent going forward.
- Markit reported its flash Eurozone purchasing managers indices (PMI) for September, with composite and services figures meeting consensus projections at 56.7 and 55.8, respectively. Data continues to point towards enhanced confidence in the region's recovery and strength.
- The Reserve Bank of India kept its repurchase policy rate unchanged at 6.00%, its lowest level since 2010. Concern has mounted recently that economic growth may be floundering after aggressive policy reforms by Prime Minister Modi.

S&P 500 Sector Total Returns (as of the 10/6/17 market close)



Equities

				D (%)
		D	M D	D
DJIA	22,773.7	1.7	1.7	17.4
NASDAQ	6,590.2	1.5	1.5	23.5
S&P 500	2,549.3	1.3	1.3	15.7
S&P 400 Mid Cap	1,818.4	1.3	1.3	10.8
Russell 2000	1,510.2	1.3	1.3	12.4
MSCI World	2,014.0	0.7	0.7	16.8
MSCI EAFE	1,972.4	-0.1	-0.1	19.9
MSCI Emerging Mkts	1,103.1	2.0	2.0	30.3

Fixed Income

				D (%)
	(%)	D	M D	D
ML US Broad Market	2.55	-0.1	-0.1	3.1
ML 10-Year US Treasury	2.36	-0.2	-0.2	2.5
ML US Muni Master	2.26	0.1	0.1	4.7
ML US IG Corp Master	3.19	0.0	0.0	5.3
ML US HY Corp Master	5.53	0.2	0.1	7.2

Commodities & Currencies

				D (%)
		D	M D	D
Bloomberg Commodity	170.8	-0.6	-0.6	-3.5
WTI Crude $/Barrel[1]	49.3	-4.6	-4.6	-8.2
Gold Spot $/Ounce[1]	1,276.6	-0.3	-0.3	10.8
	C.	E	M E	2016 E
EUR/USD	1.17	1.18	1.18	1.05
USD/JPY	112.65	112.51	112.51	116.96

Source: Bloomberg.[1] Spot price returns. All data as of the 10/6/17 close.
Past performance is no guarantee of future results.

Looking Ahead

Upcoming Economic Releases

- On Wednesday, the minutes from September's Federal Reserve Open Market Committee meeting will be released, providing investors contextual clues as to the committee's proclivity to raise its policy rate at December's meeting. The market is currently pricing in more than an 80% chance of a hike then.
- On Thursday, the Bureau of Labor Statistics will report its core Producer Price Index for September. BofAML Global Research expects monthly growth of 0.2%, picking up from August gains of 0.1%. While hurricane activity surely impacted the figure, pricing pressures appear to be building after early-summer weakness.
- Also on Thursday, Eurostat reports Industrial Production in the Eurozone for August. BofAML Global Research expects year-over-year growth to total 3.0%, which would continue a string of strong readings. Industrial activity in the Eurozone appears to be robust.

BofA Merrill Lynch Global Research Key Year-End Forecasts

& 500 I	2017 E
Target	2,450
EPS	$129.00
D	2017 E
Global	3.6%
U.S.	2.1%
Euro Area	2.1%
Emerging Markets	4.7%
	2017 E
Fed Funds (eop)	1.38%
10-Year T-Note (eop)	2.85%
C	2017 E
Gold ($/oz-period average)	$1,276
WTI Crude Oil ($/bbl-eop)	$47.00

All data as of the 10/6/17 close.

Investing involves risk, including the possible loss of principal. No investment program is risk-free, and a systematic investing plan does not ensure a profit or protect against a loss in declining markets. Any investment plan should be subject to periodic review for changes in your individual circumstances, including changes in market conditions and your financial ability to continue purchases.

Asset allocation, diversification, dollar cost averaging and rebalancing do not ensure a profit or protect against loss in declining markets.

Past performance is no guarantee of future results.

It is not possible to invest in an index.

Investments in foreign securities involve special risks, including foreign currency risk and the possibility of substantial volatility due to adverse political, economic or other developments. These risks are magnified for investments made in emerging markets.

Investments focused in a certain industry may pose additional risks due to lack of diversification, industry volatility, economic turmoil, susceptibility to economic, political or regulatory risks and other sector concentration risks.

Investments in real estate securities can be subject to fluctuations in the value of the underlying properties, the effect of economic conditions on real estate values, changes in interest rates, and risks related to renting properties, such as rental defaults.

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 uctuate in response to events speci c to the companies or markets, as well as economic, political or social events in the U.S. or abroad. Bonds are subject to inte
in ation and credit risks. Investments in high-yield bonds may be subject to greater market uctuations and risk of loss of income and principal than securities in highe
categories. Investments in foreign securities involve special risks, including foreign currency risk and the possibility of substantial volatility due to adverse political, ec
or other developments. These risks are magni ed for investments made in emerging markets. Investments in a certain industry or sector may pose additional risk du
of diversi cation and sector concentration. Investments in real estate securities can be subject to uctuations in the value of the underlying properties, the e ect of eco
conditions on real estate values, changes in interest rates, and risk related to renting properties, such as rental defaults. There are special risks associated with an in
in commodities, including market price uctuations, regulatory changes, interest rate changes, credit risk, economic changes and the impact of adverse political or
factors. Income from investing in municipal bonds is generally exempt from federal and state taxes for residents of the issuing state. While the interest income is tax
any capital gains distributed are taxable to the investor. Income for some investors may be subject to the federal alternative minimum tax (AMT).

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