The Third Industrial Revolution

- Our focus this month is on the wave of technological innovation that is sometimes known as the third industrial revolution.

- Dramatic advances are being made in the fields of robotics, energy, health care, IT and even defense that will increase productivity growth, global welfare and living standards. Technological improvements in robotics and automation will boost productivity and efficiency, translating into gains for manufacturers.

- The revolution will also benefit highly skilled workers, as well as consumers, who stand to benefit from the lower prices that result from lower production costs. Some economies will of course lose out as their traditional strengths become weaknesses (in manufacturing, for example), but others, particularly those that manage to invest in education, will win.

- **What to watch this month:** ECB meeting (June 3) for details on the progress of the quantitative easing program; Turkish election (June 7), which could increase political fragility in the country; FOMC meeting (June 17)—we think the U.S. Federal Reserve will wait until September before hiking, at the earliest.

Heatmap: Potential Winners and Losers From the Third Industrial Revolution (0 = weak, 10 = strong)

Source: Roubini Global Economics. Note: Comprises the Roubini Country Insights’ Tertiary Education, Employment Rigidity and Innovation and Technology Indicators.
Key Theme: The Third Industrial Revolution

Advances are being made in fields such as information technology, robotics, energy and health care that will dramatically increase productivity growth, global welfare and living standards, but some economies will cope better with these changes than others.

Innovation

A massive wave of innovation is taking place in a number of leading-edge industries that we can justifiably term “the third industrial revolution.”

For example, important advances are being made in energy technology that are both enhancing the recovery of fossil fuels (shale gas and oil, oil sands, etc.) and providing alternatives (clean tech). Then, there are fascinating developments in biotechnology, such as stem cell research.

We are also in the midst of another round of information technology developments: Web 2.0, Web 3.0, social media, cloud computing, and “Big Data” canvassing and analysis. Moreover, there is great excitement about developments in manufacturing technology, such as robotics and automation, 3D printing and personal manufacturing. Demand for industrial robots rose by 23% in 2014 (according to the IFR) and the development of cheaper robots suitable for use outside of factories is also kindling interest in other sectors.

Finally, in a world of heightened geopolitical tension and simmering conflicts, many new developments are happening in defense technology.

In all of these fields, major technological developments are underway that are already leading to the production of new goods and services and that will radically change the way we live. Over time, these will increase productivity growth, global welfare and living standards.

Winners and Losers

However, these benefits will come at a cost. For those not fortunate enough to share in the gains of the new economy, the revolution may as well be happening somewhere else. Entire economies are at risk of being destabilized in countries that rely on advanced manufacturing and on services-sector jobs.

Over the past 60 years, the share of workers employed in manufacturing in most developed markets has fallen markedly; in the U.S., the ratio has dropped to around 10% from 30%. There are two major trends driving this decline: first, technological innovation and automation... and offshoring.

Overall, developed markets have so far managed to make up for these losses in industrial-sector employment, with various parts of the services sector—education, health care, government, retail, financial services, real estate services, transportation—absorbing much of the slack.

A 2013 study by Carl Benedikt Frey and Michael Osborne from the University of Oxford found that jobs at high risk of automation compose 47% of traditional occupational categories, including telemarketers, accountants, editors, retail salespeople, technical writers, real estate agents/brokers, word processors and typists, machinists, commercial pilots and even economists.

Eventually, the current round of technological innovation will lead to increases in productivity and output that will, in turn, lead to greater demand, higher consumption and, eventually, an increase in certain types of jobs.

One should resist writing off challenges to this narrative as a modern form of Luddism, for there are reasons to fear that the wave of technological advances will in the quite near term lead to permanent reductions in real wages and the destruction of certain jobs. However, over time, technology creates income and jobs, and increases living standards.

Higher education is the best protection against the changes underway, and countries that are able to invest in education are well placed to weather the coming shake-up. To create broad-based prosperity, workers need the skills to participate in the brave new world being forged by the digital economy.

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**Figure 2: Annual Shipments of Industrial Robots by Destination**

<table>
<thead>
<tr>
<th>Year</th>
<th>Asia/Australia</th>
<th>Europe</th>
<th>Americas</th>
<th>Others</th>
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<tbody>
<tr>
<td>2012</td>
<td>50,000</td>
<td>50,000</td>
<td>50,000</td>
<td>50,000</td>
</tr>
<tr>
<td>2013</td>
<td>50,000</td>
<td>50,000</td>
<td>50,000</td>
<td>50,000</td>
</tr>
<tr>
<td>2014</td>
<td>50,000</td>
<td>50,000</td>
<td>50,000</td>
<td>50,000</td>
</tr>
</tbody>
</table>

Source: International Federation of Robotics, Roubini

**Figure 3: Factory Share of Employment in U.S.**

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
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<tr>
<td>2012</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>2011</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
</tr>
</tbody>
</table>

Source: Haver Analytics

Past performance does not guarantee future results.
Asset-Class Implications: Fixed Income

Developed Markets
Monetary policy divergence—the first macro theme in our Q2 Quarterly Outlook—remains at the center of attention. The Federal Reserve is still on track to begin raising rates in September. The U.S. 10-year should head to 2.5% by end-2015.

UK yields will likely rise, but lag their U.S. counterparts, especially at the short end of the curve, as we expect the Bank of England to let the Federal Reserve lead the hiking cycle.

Easing from the European Central Bank and the Bank of Japan (and we expect more of that later this year) will keep German bund and Japanese government bond yields very low across the curve.

Emerging Markets
In general, the past month of carry trades has made valuation unattractive for many high-yield emerging-market assets, and even those that have underperformed (such as Turkey) have near-term political headwinds.

The Brazilian real looks vulnerable at current levels, although carry remains significant. Brazilian rates look more attractive, particularly if markets continue to overprice hikes (we see only another 25 bps versus the 50-75 bps priced in for 2015).

Intra-Asia trends, such as the outperformance of oil importer currencies (for example, India and Indonesia) over that of Malaysia, should continue.

We no longer see the Russian rouble outperforming, following a sharp rally in March-April that outpaced the oil-price move, but there still seems to be value in local bonds as the easing we expect does not seem to be fully priced in.

Markets seem optimistic on Venezuela’s 2015 redemptions, which continue to trade at close to par—our baseline suggests it can eke its way through, but it will not be easy. Hungarian bonds have more space to rally, and should outperform regional peers.

Asset-Class Implications: Equities

Developed Markets
Japanese equity remains our top developed-market equity pick, while renewed euro weakness should support eurozone equities (hedge FX risk for both).

The euro’s recent strength strikes us as a temporary result of USD weakness triggered by softer-than-anticipated U.S. GDP data.

We expect euro weakness to return in subsequent months—a trend that will favor Italy and Germany over France and Spain (German stocks, which have underperformed, would be especially poised for a boost, playing catch-up).

Once the euro stabilizes, however, domestic activity will become the focus, setting the stage for Spain to outperform Italy in the medium term.

Our macro views still support an end-2015 target of 2150 for the S&P 500, but we prefer markets outside the U.S.

Emerging Markets
Developed-market easing and the higher probability of delayed Federal Reserve rate hikes remain supportive of emerging-market assets.

Countries that were previously top performers due to their reform trajectories are now being judged on how they are implementing those reforms (for example, Brazil, India, Indonesia and Mexico).

We see opportunities in countries that have attractive valuations and stable or improving macro fundamentals, such as Mexico, Poland, South Korea and Russia.

Elsewhere, we close our negative view on South African equities, as the external environment looks more benign and global sentiment seems more important than valuation.

Figure 4: Sterling Strength Reduces Need for Bank of England Hikes

![Figure 4: Sterling Strength Reduces Need for Bank of England Hikes](source: Bloomberg)

Figure 5: Recent Price Moves Relative to Euro—In Line With Fundamental Betas, but Germany Underperforming

![Figure 5: Recent Price Moves Relative to Euro—In Line With Fundamental Betas, but Germany Underperforming](source: Datastream, Roubini Global Economics)
Asset Class Implications: Commodities

The Australian and US meteorological organisation have increased the probability of El Niño lasting into the Northern Hemisphere summer and autumn. An El Niño can make some parts of the world hotter and dryer than usual and other parts more wet.

![Warm Episode Relationships](Warm%20Episode%20Relationships.png)

The weather event is now likely to last into the reproductive growth phase of several crops and should its intensity increase, it could damage certain crops such as Australian wheat, cocoa and sugar.

![The probability of an El Niño lasting all year has increased](The%20probability%20of%20an%20El%20Niño%20lasting%20all%20year%20has%20increased.png)

The metrological organisations’ models predict the El Niño could reach at least a moderate strength (with the usual caveat of ability to forecast in spring not being that great).

Cocoa has already rallied 8.3% in the past month as falling yields in Ghana threaten to drive the market into a supply deficit this year. We expect crop conditions to worsen in West Africa as a lack of rain will exacerbate dryness.

If the El Niño lasts until September (as currently forecast by the meteorological organisations), US soybean yields could increase. With farmers already planning to plant record amounts this year, we expect soybean prices to decline.

Asset-Class Implications: Foreign Exchange

The stage is set for the Chinese Renminbi to become the latest currency to be a part of the International Monetary Fund (IMF)’s virtual currency, the SDR (Special Drawing Rights). Inclusion of the Renminbi will represent the biggest change the IMF has made to its global reserve asset, since its creation in 1969. The next SDR valuation review process begins in October/November 2015, with a final decision expected to be announced in early 2016.

There are two main tests for the RMB to be included in the SDR valuation basket: Firstly the currency needs to be important for global trade. The Renminbi will pass that test with flying colours, being the fifth most used payment currency, according to SWIFT. The second is the currency has to be “freely usable”. The Renminbi will struggle with this test, but that struggle will be the catalyst for further financial market reform. Indeed, the PBoC Governor recently announced that China will achieve full capital market convertibility in 2015 to help secure the RMB’s inclusion in the SDR basket.

![China Exchange Rate](China%20Exchange%20Rate.png)

Significant expansion in RMB offshore clearing centres around the world has helped fuel this trend and access to the currency has never been easier. Additionally, since the last IMF assessment five years ago Renminbi trading currency trading bands have been loosened, and controls on the Yuan-HK Dollar convertibility abolished in recognition of the demand for Renminbi. With further financial liberalisation measures expected to be announced in 2015, we expect that the Chinese Renminbi has significant potential to be included in the SDR basket. The IMF recently indicated that it no longer sees the Renminbi is overvalued and the stabilisation of foreign currency reserves certainly supports this.

China’s inclusion would be largely symbolic, but would signal that its voice in the global policy debate is increasingly being heard. By including RMB in the SDR calculation basket, it enhances China’s status and recognises its significant standing in the global economy. However, the final word could be left to the US: Inclusion requires a 70% majority agreement from the IMF Executive Board. The US account for 17% of the vote and unfavourable diplomatic relations could be the one sticking point.

Past performance does not guarantee future results.
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