Key Insights

We have identified three major trends that are transforming the U.S. economy. Automation of knowledge work and advanced robotics are two trends that may result in short term job losses. However, we found that improvements in industrial production may drive unemployment lower over time. Advances in energy technology comprise the third transformational trend, and are driving a production boom and a decrease in energy prices. The combination of these trends has contributed to increase U.S. competitiveness and is driving the transition towards a re-industrialization of the U.S.

At this stage of the recovery, the Fed is in the process of transitioning from a zero interest rate policy towards a normalized interest rate regime. The employment environment is now the major Fed focus, while inflation seems of less concern. This may result in the Fed holding rates at zero for longer than is economically necessary.

Asset valuations in the U.S. do not appear to be overly stretched, but concerns about bubble-like conditions in the corporate credit market have recently surfaced. We believe that an in-depth analysis of each issuer’s ability to take advantage of the current economic trends – or the degree to which they will be hurt by them -- is critical to determining the likely winners and losers in this rapidly evolving economy.

1. What Happened to the Jobs?

The label Stagnation appears to have captured the public’s mood. In the eyes of many, this freight train of seemingly unsolvable problems - cost and quality of education, income disparity, structural unemployment - is leading to an accelerating decline of the U.S. and a possible near-term repeat of the Global Financial Crisis that ravaged investor portfolios.

In our opinion, much of the public pessimism on the U.S. economy is rooted in the challenges that the labor sector is facing.

Our analysis shows that the weak employment cycle began a long time ago. The decline of labor force growth was largely driven by a secular trend that is the foundation of the Stagnationists argument - demographics. The key elements of this include: retiring baby-boomers, a decline in female labor participation, and a standstill in immigration.

Although the labor supply is largely driven by population growth, it is also dependent on the share of the working-age population that is actually in the labor market. This “participation rate” has also been on the decline since 2000. As the table below highlights, the key loss has been in the younger population (as this segment of the population has stayed in school longer), but also in the most productive sector of the workforce (25-54 year olds).
Innovation trends retooling the U.S. economy: The impact for fixed income investors

Worldwide, over the next decade, knowledge work automation is likely to affect millions of jobs, especially clerical, sales, education and IT.

Table 1: Participation Rate by Age (% Employed Full Time vs Total Population)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Age 16-24 years</td>
<td>66.5</td>
<td>61.2</td>
<td>55.2</td>
<td>-11.3</td>
</tr>
<tr>
<td>Age 25-54 years</td>
<td>83.5</td>
<td>82.6</td>
<td>80.8</td>
<td>-2.7</td>
</tr>
<tr>
<td>Age 55 years and over</td>
<td>30.2</td>
<td>36.6</td>
<td>40.1</td>
<td>+9.9</td>
</tr>
<tr>
<td>Total Working Population</td>
<td>66.7</td>
<td>65.9</td>
<td>62.9</td>
<td>-3.8</td>
</tr>
</tbody>
</table>


We are convinced that these signs of structural weakness are linked to the technological replacement of human workers. Today’s manufacturing employee produces more than twice the amount as the same worker in 1990. This growth in productivity has been driven by technological innovation, automation and lean manufacturing.

Analyzing the employment trends we see that there has been a broad decline across some major sectors such as Manufacturing, Construction, Mining, and Information.

2. Innovation Trends in the U.S.

Disruptive technologies such as the steam engine, electricity and the automobile destroyed numerous industries, caused significant unemployment and put out to pasture a lot of horses. But new industries also turbo-charged economic growth and ultimately created more jobs than were eliminated. The difficulty today is in seeing through this painful period of industrial restructuring and recognizing that humans are not the “horses” in this technological roadmap.

We have identified three major trends that are transforming the U.S. economy.

Trend #1 The Automation of Knowledge Work

The trend of knowledge work automation is being driven by advances in computational power, and other accompanying technologies are helping enable this shift. These include significant strides in data storage, big data (enabling the analysis of huge amounts of data), cloud computing (delivering knowledge work automation to individuals via Internet-enabled devices), machine learning and natural user interfaces such as speech recognition.

Worldwide, over the next decade, knowledge work automation it is likely to affect 100 million jobs that cost business and society $5-6 Trillion annually.

Occupations such as clerical, sales, education and IT are among those that could see the major impact of automation in the future, but fields commonly thought to be impervious to automation will be affected as well.

Trend #2 Advanced Robotics

The global demand for robots is expected to grow by 8% per year through 2016, dramatically outpacing the world’s manufacturing activity. By 2016, the total number of multipurpose industrial robots is forecast to hit 1.6 million.

There are numerous factors behind this accelerating demand including:

- **Global competition** and increasing labor costs in many areas of the world previously perceived as “low wage” countries;
- **Technological improvements** allowing for wider use of robots in smaller, less scalable segments of the economy;
- **Falling prices** due to economies of scale.

**Trend #1 & #2 Implication – How will they affect jobs?**

Automation of knowledge work and the use of robots should increase productivity, but how will it affect jobs? The chief concern is that these trends will result in a permanent, structural loss of employment.

While public attention today is focused on the jobs lost to automation, a recent survey from the Manufacturing Institute and Accenture indicated that the shortage of skilled workers has been growing. We suspect that, as with past periods of technological job replacement, a skill gap has been created. This gap eventually gets filled through education, training and a general redirection of resources, resulting in improvements in the job market.

We have analyzed the annual changes in industrial production compared to changes in the unemployment rate over the last 60 years (Chart 1).

**Chart 1 Industrial Production and Employment: An Inverse Relationship**


We found no significant short-term relationship between changes in industrial production and employment. However, over time, improvements in industrial production lead to higher, not lower, employment. We believe that one of the missing ingredients for a healthier employment environment is a more dramatic improvement in production competitiveness. This brings us to the third, intersecting trend.

**Trend #3: Energy Revolution**

Geographic labor arbitrage drove manufacturing jobs overseas for the past 30 years. But in the coming decade, labor cost differentials will not be the primary driver of manufacturing investment. It will be the cost of energy. And thanks to another technological revolution, the U.S. finds itself in the enviable position of having the lowest cost energy in the world.

In fact, the recent resurgent natural gas supply driven by the “fracking” process and the subsequent drop in price (Chart 2) resulted in an increase in the share of

---

1 Data as of January 2014.
electricity in the U.S. generated by gas from 18% in 2004 to 26% in 2014. The average price of electricity has also declined, while in the rest of the world it has increased.

Chart 2 Natural Gas Prices Moving - The U.S. Advantage


Trend #3 Implication: The “Re-industrialization” of the U.S.
Announcements of “re-shoring” by U.S. companies and the launching of new U.S. manufacturing sites by foreign companies are rapidly building. As of May 2014, over 50% of large American companies with manufacturing sites in China are considering moving capacity back to the U.S.

Over the last decade, the change in competitiveness has been dramatic. The most dramatic comparison is with China whose manufacturing cost advantage over the U.S. has declined (Chart 3). The U.S. is now the second-cheapest manufacturing location (based on costs for wages, productivity growth, energy costs and currency exchange rates) in the world.

Chart 3 Manufacturing Competitiveness - Cost Difference vs U.S. in %

Source: Pioneer Investments, Boston Consulting Group (BCG). Data as of May 1, 2014. Analysis based on the Manufacturing Cost Index from BCG. The index covers costs for wages, productivity growth, energy costs and currency exchange rates. No difference are assumed in other costs (for example, raw material inputs, machine and tool depreciation. The cost structure is calculated as a weighted average across all industries.

The energy revolution could bring a competitive advantage for the U.S.

The U.S. energy advantage combined with the growth in productivity has contributed to increase U.S. competitiveness.

Source: Energy Information Authority, data as of May 31, 2014
Source: Boston Consulting Group. Press Release as of September 24, 2013. Majority of Large Manufacturers Are Now Planning or Considering ‘Reshoring’ from China to the U.S.
Boston Consulting Group projects that “As a result of its increasing competitiveness in manufacturing, the U.S. will capture $70 billion to $115 billion in annual exports from other nations by the end of the decade. By 2020, higher U.S. exports, combined with production work that will likely be reshored from China, could create 2.5 million to 5 million American factory and service jobs.”

In the coming decade, as the U.S. becomes increasingly energy self-sufficient, the opportunity to re-energize manufacturing by tilting education towards engineering, mathematics and biology will be critical to fully exploiting the growth opportunities.

3. Research in an Era of Innovation

We believe that all these changes will have major impacts on the economy. And that new modes of research and analysis will be necessary in order to enable interpretation of the impact of these changes on both the macro and micro levels of the economy.

Implications for U.S. Monetary Policy

Fed policy is in the process of transitioning from a zero interest rate regime towards a normalized interest rate paradigm. While inflation has historically been the Fed’s primary focus, unemployment appears to be the Fed Chair’s primary concern now. In recent speeches and in the Fed minutes, Janet Yellen noted that, despite progress in the unemployment rate, other measures such as long-term unemployment and a lack of wage growth point to significant slack.

A misunderstanding of the causes of this protracted unemployment cycle may result in the Fed holding rates at zero for longer than is economically necessary. The possible consequences of maintaining a “too low” interest rate policy for too long are well known. These include financial bubbles, misallocation of capital and the proliferation of “leverage” that inevitably spawns the next crisis. At this stage of the recovery, asset valuations in the U.S. do not appear to be overly stretched, but concerns about bubble-like conditions in the corporate credit market have recently surfaced.

Implications for the Credit Markets

With Treasury yields persisting at very low levels, investors have been searching for opportunities in credit markets for additional yield. Spreads are now near their historical lows.

The Fed’s unconventional monetary policy response has effectively allowed the credit market to “front run” the interest rate cycle. However, we are not in the camp that believes we will witness a major re-rating of the credit markets any time soon. Our analysis of the health of the credit markets indicates that cash flow coverage of debt is strong, in part due to the aforementioned high margins enjoyed by companies in this cycle, as well as the cost of that debt capital.

However, we are witnessing a deterioration of underwriting standards as more debt is issued without covenants (Chart 4) and the average leverage (debt/EBITDA) of new issuance creeps higher.

Selection in the Era of Innovation

In this era of accelerating innovation, we believe that a fundamentally different analytical perspective on long-term factors shaping the economic landscape is required. This framework, together with our more traditional sector/business financial analysis, will potentially enable us to identify unique return opportunities and uncover hidden risks in each market.

Key factors we believe are worth watching for:

- New technologies’ impacts on sector trends
- New business emergence
- Rapidly evolving disruptive competitors
- Business model flexibility; the ability to leverage a platform, respond to competitive threats, reshape product and service offerings
- Demonstrable innovation track record (ability to enter new markets/launch new products)
- The ability to attract/retain innovation talent, shed costs, rapidly increase productivity

Important Information

Diversification does not guarantee a profit or protect against a loss. Unless otherwise stated, all information contained in this document is from Pioneer Investments and is as of September 30, 2014. It is not possible to invest directly in an index. Unless otherwise stated, all views expressed are those of Pioneer Investments. These views are subject to change at any time based on market and other conditions and there can be no assurances that countries, markets or sectors will perform as expected. Investments involve certain risks, including political and currency risks. Investment return and principal value may go down as well as up and could result in the loss of all capital invested. This material does not constitute an offer to buy or a solicitation to sell any units of any investment fund or any services.

Pioneer Investments is a trading name of the Pioneer Global Asset Management S.p.A. group of companies.

Date of First Use: October 7, 2014.