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U.S. Manufacturing Trends and Opportunities

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INTRODUCTION

The resurgence of U.S. manufacturing has become the focus of much analysis since the U.S. economy has emerged from the Great Recession over the past few years¹. Economic and political debates question whether or not a manufacturing renaissance is occurring and is sustainable, whether new industries and technologies are creating an impact on manufacturing and whether this trend will result in a meaningful number of new jobs. While the impact on jobs remains debatable given advances in technology and automation, Pantheon believes that a metamorphosis in U.S. manufacturing is underway that can influence private equity investment for years to come.

This InFocus highlights three secular trends underpinning the U.S. manufacturing boom:

1. The re-shoring of manufacturing to the U.S.
2. The extraction of U.S. shale reserves
3. The residual effects of a resulting long-term supply of cheaper energy

Careful analysis of U.S. manufacturing market drivers can provide a deeper level of understanding and enhance investment decisions going forward. Investors can better assess investments in manufacturing-focused funds, isolate co-investments in companies benefiting from one or more of the aforementioned key themes, and highlight secondary investments in portfolios with a high exposure to manufacturing.

KEY CONCLUSIONS

- > U.S. manufacturing fundamentals are improving, in part due to three long-term trends discussed in this InFocus
- > The erosion of China's labor cost advantage has caused a number of firms to consider re-shoring of manufacturing to the U.S.
- > Production of the U.S. shale energy plays has created substantial demand for manufactured equipment required for drilling, transportation and processing of oil and gas
- > A secondary effect of U.S. shale development is an abundant supply of low-cost natural gas, which should provide a new and long-term competitive advantage for certain large manufacturing sectors such as chemicals
- > Private equity firms can be well positioned to identify these trends and provide strategic direction to U.S. manufacturing companies

¹ Source: U.S. Q2 GDP grew 4.6%, Commerce Department, September 26, 2014

BACKGROUND: U.S. MANUFACTURING IN CONTEXT

Until recently, commentary focused on the long-term decline in U.S. manufacturing, and the rise of China and Asia as the low-cost manufacturing destinations of choice. China overtook the U.S. to become the largest contributor to global manufacturing GDP in 2010, and by 2012 China accounted for 22.6% of global manufacturing GDP compared to 17.6% for the U.S.² U.S. manufacturing, however, has not gone away. Though manufacturing has declined to 12.4% of U.S. GDP in 2013 compared with nearly 30% in the 1950s, when most other manufacturing nations were recovering from World War II, manufacturing output has grown in absolute terms. After a brief downturn in 2008 and 2009, U.S. manufacturing is once again on an upward trend and currently produces \$2.1 trillion of annual U.S. GDP³, spanning a broad range of industries, with the largest being chemicals, computer and electronics, and transportation equipment.

Moreover, the U.S. remains the clear number two in terms of manufacturing with an 18% global share of GDP, behind China at 23% but only marginally behind the 18.7% combined share of the next three largest manufacturing nations, Japan, Germany and South Korea⁴. As a result, the U.S. manufacturing base is currently strong and boasts thousands of companies across many industries, supported by strong consumption trends at home and overseas. The U.S. manufactures 70% of everything it consumes⁵ and manufacturing accounts for 60% of U.S. exports⁶.

As explored in the re-shoring section below, changes in China have helped shine a light back on the U.S. and can set a positive backdrop for U.S. manufacturing. This creates a tailwind for opportunities in an established sector for private equity.

TREND 1: RE-SHORING: U.S. MANUFACTURING BECOMES MORE COMPETITIVE

Re-shoring refers to the return of manufacturing to the U.S. from low-cost countries, predominantly in Asia. The impact of returning manufacturing could result in an additional \$100 billion of annual economic output in the U.S., according to research by The Boston Consulting Group⁷.

We believe the key factor behind the shift is the rising cost of labor in China, which is rapidly closing the gap on the U.S. In contrast to the U.S., Chinese manufacturing labor is becoming increasingly constrained. The labor force in the Yangtze River delta region in particular, which includes Shanghai and Nanjing, is increasingly scarce, while the skilled labor base for high-value manufacturing is underdeveloped. As a result, China's manufacturing compensation growth averaged 19% annually from 2005 to 2010, compared to 4% annual growth in the U.S.⁸

The Boston Consulting Group forecasts that China's labor advantage will continue to erode in the coming years. On a productivity-adjusted basis, a U.S. worker was 4.6x more expensive to employ than his Chinese counterpart in 2005, but is expected to be only 2.3x more expensive in 2013⁹ (see Figure 1 on the next page).

² Source: United Nations Database, May 6 2014 U.S.

³ Source: Bureau of Labor Statistics, Bureau of Economic Analysis, U.S. Treasury. GDP data as of 2013

⁴ Source: United Nations Database, May 6, 2014

⁵ Source: The Boston Consulting Group, U.S. Manufacturing Nears the Tipping Point, March 2012

⁶ Source: Advanced Manufacturing National Program Office, 2010

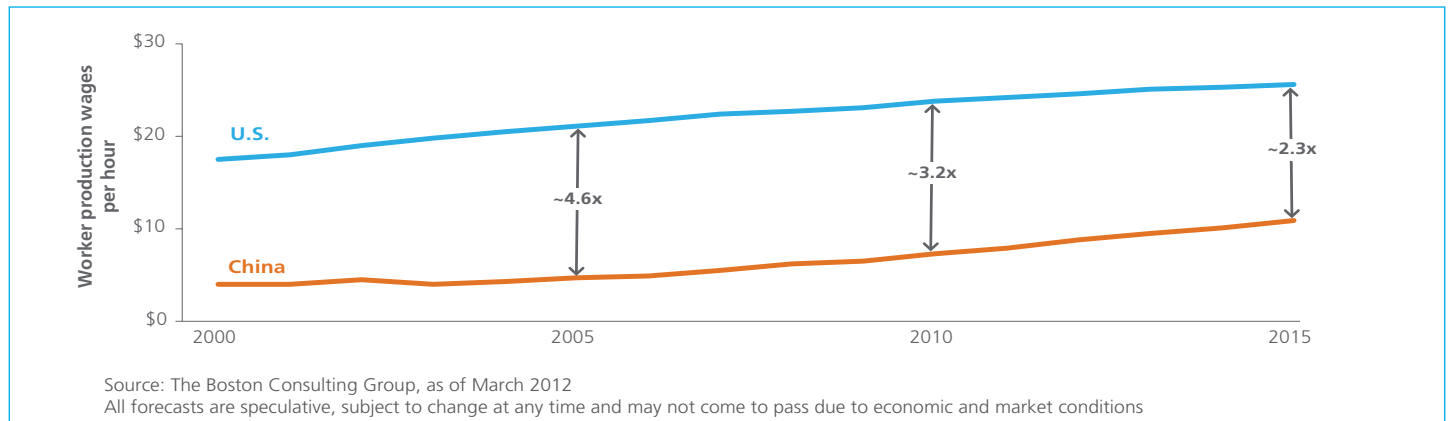
⁷ Source: The Boston Consulting Group, U.S. Manufacturing Nears the Tipping Point, March 2012

⁸ Source: The Boston Consulting Group, U.S. Manufacturing Nears the Tipping Point, March 2012

⁹ Source: The Boston Consulting Group, U.S. Manufacturing Nears the Tipping Point, March 2012



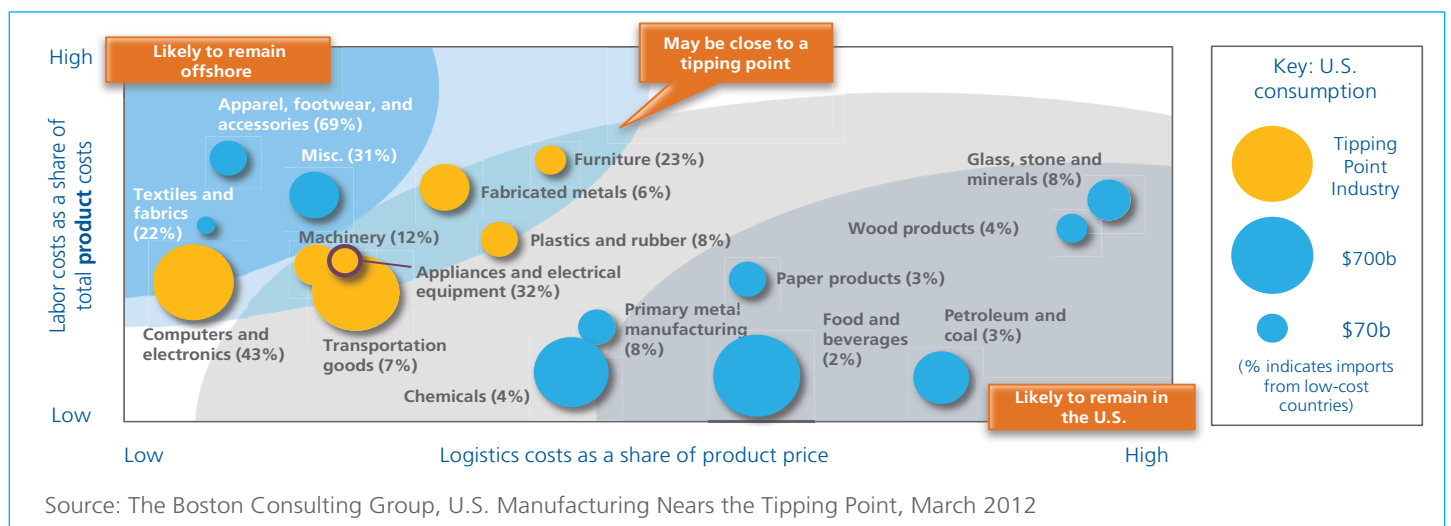
Figure 1: Productivity-Adjusted Wage Rates



Rapidly rising costs and diminishing savings in China are bringing other considerations into sharper focus. After all, labor is only one part of the total cost to produce and ship manufactured goods. According to a Morgan Stanley survey on re-shoring, over 70% of companies cite proximity to customers as the key reason for re-shoring manufacturing operations to the U.S., while almost 50% say closeness to suppliers is another critical factor¹⁰. Outsourcing of manufacturing to China not only adds shipping costs, but also time to delivery of 2-3 months by container ship. Other considerations for moving back to the U.S. should include stronger intellectual property protection and a more stable political climate.

While goods that rely most heavily on labor for their production, such as clothing or textiles, will still retain a meaningful cost advantage and are likely to remain in Asia and other low cost labor countries, many industries are close to a tipping point where it makes financial sense to bring manufacturing back to the U.S. They include machinery, computers and electronics, appliances and electrical equipment, and furniture production. In these industries, labor typically makes-up less than 25% of costs while transportation can be expensive for finished goods, enhancing the case for re-shoring (see Figure 2).

Figure 2: Seven U.S. industry clusters may be close to a tipping point



The seven "Tipping Point" industries in Figure 2 above account for \$200 billion of the total \$300 billion in goods imported annually from China, representing a massive growth opportunity for the U.S. as re-shoring occurs. In its analysis, Boston Consulting Group estimates an increase in U.S. annual output of \$100 billion as a result of re-shoring¹¹. In light of this upside it is clear that more and more company directors are weighing the benefits. In a late 2013 survey, over 50% of CEOs surveyed confirmed they were considering bringing manufacturing back to the U.S., compared with 37% less than 18 months earlier¹².

¹⁰ Source: Morgan Stanley Research (N=21), April 29, 2013

¹¹ Source: The Boston Consulting Group, U.S. Manufacturing Nears the Tipping Point, March 2012

¹² Source: The Boston Consulting Group, CEO Survey, September 2013 and April 2012

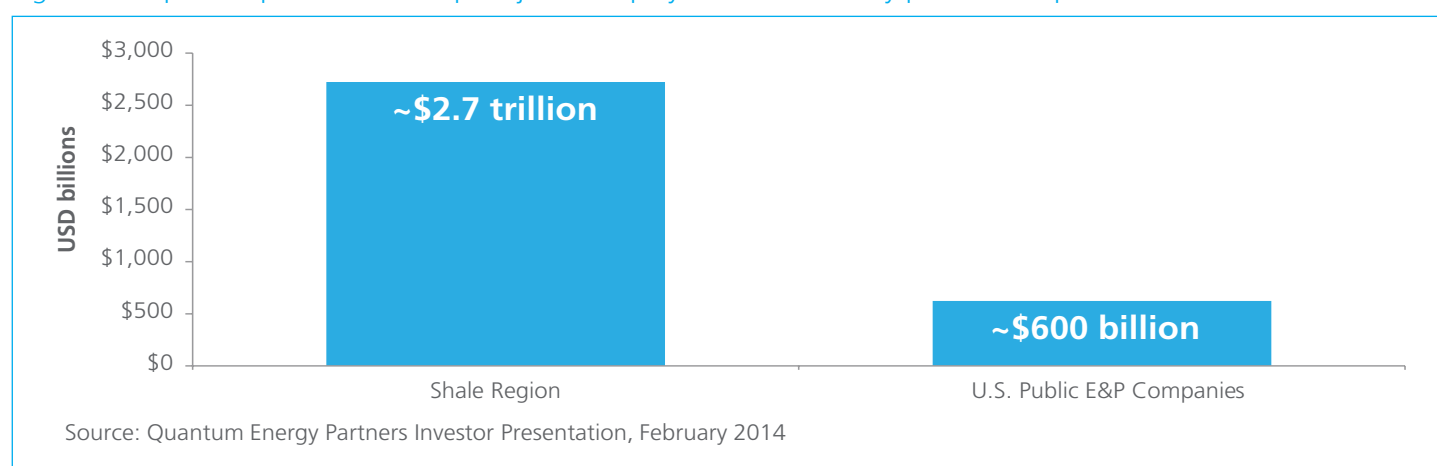
As manufacturing moved offshore, the average age of domestic plants has risen steadily since the 1980s to almost 16 years. Similarly the equipment used in them is now on average 14 years old¹³. Private equity is positioned to provide capital to update ageing equipment, help improve supply chain management and guide strategic decision-making to potentially take advantage of the re-shoring trend. Private equity may also be able to identify investments in domestic manufacturers with existing excess capacity where operating leverage may result in meaningfully increased profits as volumes increase.

TREND 2: SHALE ENERGY DEVELOPMENT: FOCUS SHIFTS TO EXTRACTING RESERVES

The discovery and rapid development of shale oil and gas has been one of the hottest topics in U.S. industry over the past five years. From less than 2% of North American natural gas supply in 2001, shale gas now accounts for 30% and is expected to reach 49% of supply by 2035¹⁴, largely as a result of improved hydraulic fracturing and horizontal drilling technology. Similarly, U.S. production of shale oil has increased dramatically in the past few years, from 12% of total U.S. oil production in 2008 to 35% in 2012, and is projected to reach 50% by 2019¹⁵. While renewable energy developments have had some success, fossil fuels are expected to remain the dominant sources of energy, driven in part by the relatively low-cost and abundant shale opportunity and rapidly-escalating emerging markets demand.

While acquiring shale acreage and exploring for reserves has been a key play for Exploration & Production companies over the past few years, the focus is now moving to the actual production of these shale opportunities, particularly in oil. This stage of production is highly capital intensive, requiring significant spending on services and equipment in particular. Shale production equipment includes a broad range of technologically-advanced products ranging from drills, pressure valves and fracking equipment to containers and trucks, all of which requires a supply chain of design and manufacturing businesses. According to Quantum Energy Partners, an estimated \$2.7 trillion is needed to develop the 12 largest U.S. shale reserves, a figure which dwarfs the \$600 billion market capitalization of the listed U.S. energy and production industry (see Figure 3 below)¹⁶.

Figure 3: Capital required to develop major shale plays vs. E&P industry public enterprise value



The high costs are a sign of the complexity of shale operations. Hydraulic fracturing and horizontal drilling, at depths of several hundred metres to two kilometres or more, creates practical challenges related to high pressures, temperatures and other physical forces. These types of wells can cost millions of dollars, and drive demand for increasingly innovative and high-quality components. In fact, hydraulic fracturing equipment accounts for 49% of the total cost of a drilling pad¹⁷.

¹³ Source: Bureau of Economic Analysis, November 2013

¹⁴ Source: U.S. Energy Information Administration, Annual Energy Outlook, June 2012

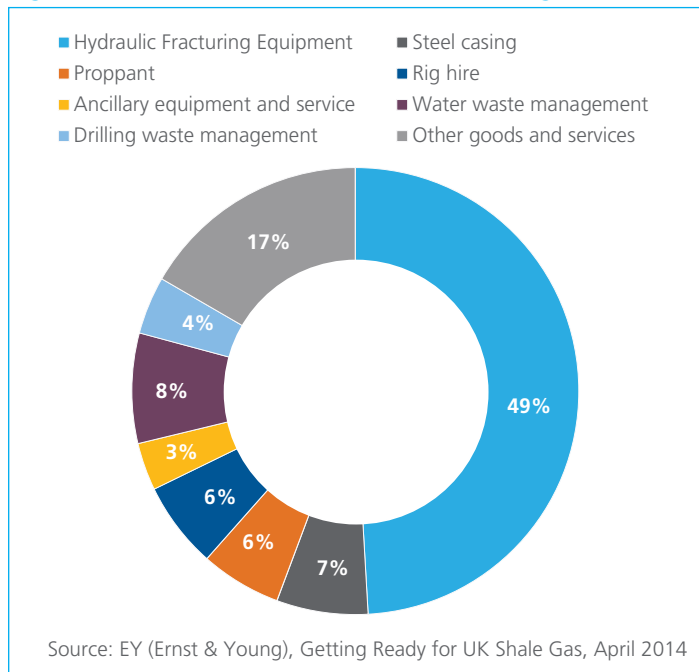
¹⁵ Source: U.S. Energy Information Administration, Annual Energy Outlook, June 2014

¹⁶ Source: Estimate from Quantum Energy Partners Investor Presentation, February 2014

¹⁷ Source: EY (Ernst & Young), Getting Ready for UK Shale Gas, April 2014



Figure 4: Cost breakdown of a shale drilling pad



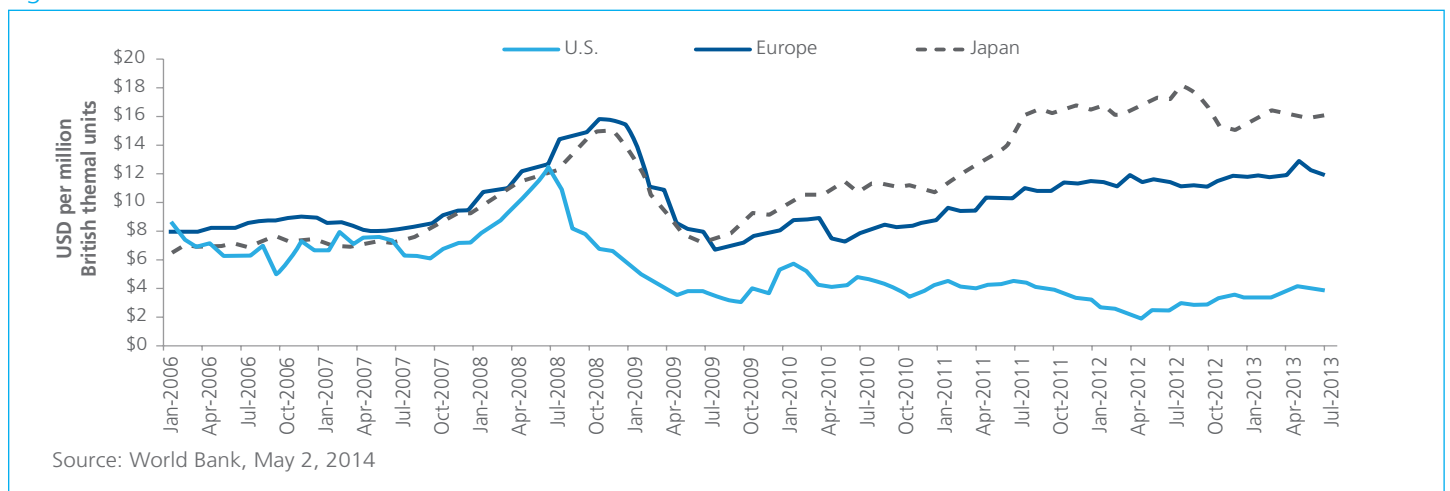
Furthermore, vast spending is also needed to manufacture the mid-stream infrastructure required to store, transport and process the extracted shale oil and gas, along with related services like water treatment and waste recycling. In total, some \$640 billion of investment is needed in the U.S. mid-stream sector between 2014-2035¹⁸, as historic investment has failed to keep pace and must also adapt with the requirements and geographic locations of the shale basins.

Private equity funds targeting oil and gas production have increased dramatically in number and size in recent years but private equity is also well positioned to play a role in the energy sector via manufacturing. Manufacturing companies that design and produce equipment and components for the production process and infrastructure stand to benefit from increased volume for years to come.

TREND 3: CHEAP ELECTRICITY AND GAS: CHEMICALS INDUSTRY BENEFITS FROM LOWER COSTS

The abundant natural gas supply in the U.S. is a consequence of the shale gas revolution and has resulted in a meaningful competitive advantage for the U.S. in global gas prices (see Figure 5). This development has created its own set of opportunities within the U.S. manufacturing sector. Just as lower labor costs are the impetus for re-shoring some industries to the U.S., lower energy bills are transforming the competitiveness of industries that consume large amounts of gas and electricity in their manufacturing processes.

Figure 5: Global Natural Gas Prices



Most manufacturing sectors are inherently high users of electricity and should benefit from cost savings. Industries that use more than the average amount of energy for manufacturing include paper, aluminium, steel and chemicals production¹⁹. These industries should stand to benefit most significantly from the renewed momentum and margin improvements as meaningful energy cost savings fall to the bottom line.

¹⁸ Source: North American Midstream Infrastructure through 2035: Capitalizing on our Energy Abundance. March 18, 2014. Interstate Natural Gas Association of America and ICF International

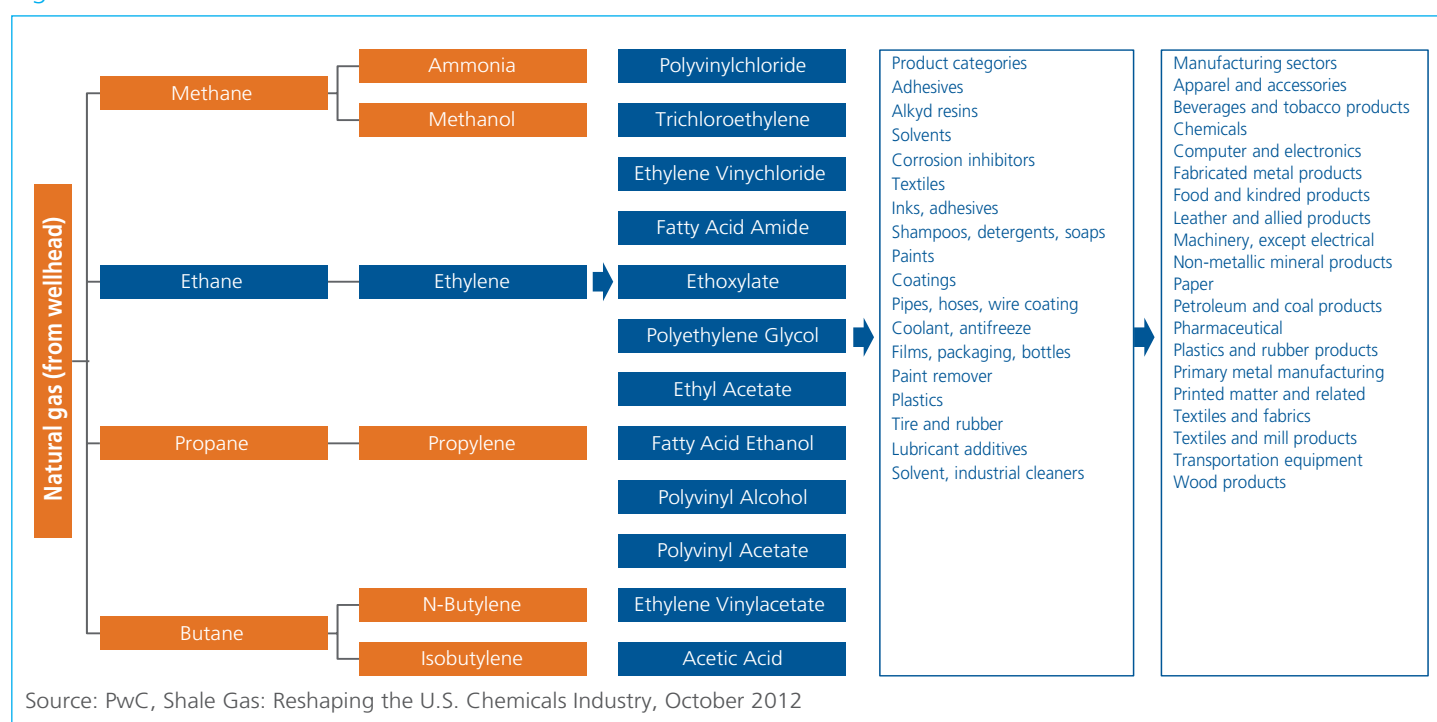
¹⁹ Source: Morgan Stanley Research (N=21), April 29, 2013

The greatest beneficiary of the increased supply of natural gas is likely to be the chemical manufacturing industry, which currently accounts for approximately 18% of U.S. manufacturing²⁰. Chemical manufacturers can benefit not only due to energy consumption savings but also because natural gas liquids, a key feedstock for production, are also now significantly cheaper. As a result, the chemicals industry is now among the lowest cost chemical producers globally. As chemicals producers are adapting to convert facilities to use natural gas as their key feedstock instead of oil, the industry is undergoing a massive capacity expansion period. Commodity chemical manufacturers have announced upwards of \$100 billion in capital expenditures for plant expansion by 2020²¹.

As a result of this resurgence, the U.S. chemicals industry has become a target-rich investment environment. For the private equity industry, we believe there are likely many ways to take advantage of this opportunity either directly through investment in chemical manufacturers or in various other business in the value chain. For instance, some general partners have increasingly targeted investments in specialty chemical producers, some being divested by industry players restructuring their portfolios to adapt to the new environment. By way of example, Dow Chemical, the largest U.S. chemicals manufacturer, has announced plans to divest \$4.5 to \$6 billion in non-core assets by 2015 in order to optimize its portfolio²². Another opportunity for private equity to participate in this trend is to invest in manufacturing companies that make products for use by the chemicals industry. For instance, over 30% of the \$100 billion announced capital investment is earmarked for the purchase of manufactured equipment such as piping, valves, heat exchangers, pressure vessels and pumps²³.

There are also second and third-tier opportunities in the many manufacturing companies that can potentially benefit from the increasingly sophisticated products made by chemicals producers. For instance, ethylene products derived from ethane in natural gas can produce adhesives, plastics, paints and coatings. Those in turn are used in making electronics, machinery, pharmaceuticals and textiles. As changes in supply and costs flow through the industry value chain many of these sectors may have opportunities to innovate and profit.

Figure 6: Illustrated Chemical Value Chain



²⁰ Source: Bureau of Economic Analysis, April 25, 2014. By GDP

²¹ Source: American Chemistry Council, Shale Gas, Competitiveness, and New U.S. Chemical Industry Investment, May 2013

²² Forbes, Dow Expands Divestiture Target to Boost Profitability, March 25, 2014

²³ Source: American Chemistry Council, Shale Gas, Competitiveness, and New U.S. Chemical Industry Investment, May 2013



CONCLUSION: NEW OPPORTUNITIES IN AN ESTABLISHED SECTOR

Manufacturing has long been a core private equity investment theme. While buyouts of manufacturing companies fell out of favor to some extent in the wake of the financial crisis, some general partners now have a heightened focus on the sector.

The investment themes explored in this InFocus provide the basis on which strong private equity investors can identify manufacturing opportunities that are undervalued and where their capital and influence can position companies for growth. The trends are not a guarantee of success but, in Pantheon's view, can provide an encouraging opportunity set for private equity investment.

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