Manufacturing

The new maker rules

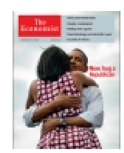
Big forces are reshaping the world of manufacturing

Nov 24th 2012 | NEW YORK | From the print edition | Timekeeper

Print edition


Nov 24th 2012

Nov 17th 2012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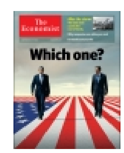

Nov 3rd 2012

From the print edition Nov 24th 2012

"YOU can carry your own head in your hand," enthuses Bre Pettis, inviting customers to try out a three-dimensional photo booth that will scan their head and then print a miniature plastic version of it as a solid object. This is useful, no doubt, for those about to audition for the role of Zaphod Beeblebrox in "The Hitchhiker's Guide to the Galaxy".

Mr Pettis, the founder of MakerBot, a maker of low-cost 3D printers, spoke at the opening of his firm's first retail store on November 20th in New York. It will sell desktop MakerBots, which make things out of plastic, for just $2,200. It is still early days, but MakerBots and machines like them are "empowering people to make the things they want, rather than buy them from factories," says Mr Pettis.

In this section

Collectors, artists and lawyers

Certainly 3D printing is hot. Some firms are already using the technology, which is also known as additive manufacturing because it involves building up material layer by layer. It can

h things as prototype cars, hearing aids, medical implants. On the same day that store, GE announced it had bought for Morris Technologies, a Cincinnati firm D printers (which cost $500,000 or more) gineers. Morris will be printing metal t engine.

one of many production technologies transforming the way companies will be able to make things in the future. The old rules of manufacturing, such as “you must seek economies of scale” and “you must reduce unit-labour costs”, are being cast aside. New machines can print every item differently. More flexible robots are getting cheaper and better at doing all the boring and dirty stuff.

Reprints

Add to that another 1.8 billion consumers who will join the global marketplace in the next 15 years and “Manufacturing the Future”, a new report by the McKinsey Global Institute, has good cause to be optimistic. Demand will grow not only for basic goods (which are typically made in developing countries) but also for the costly, innovative gadgets and high-tech products that rich countries make. McKinsey reckons that rich countries will keep making such products better than anyone else.

Developing countries will continue to increase their share of global production. Measured by nominal value added, by 2010 China had surpassed Japan to become the second-largest manufacturing nation, after America. A decade earlier it was in fourth place. In the same period, Brazil jumped from 12th to 6th and India from 14th to 10th. Britain slipped from 5th to 9th.

As countries get richer, manufacturing tends to account for a smaller share of their GDP. The point at which this decline starts varies (the share usually peaks at 20-35%), as does the rate of decline. In the 15 largest manufacturing economies, manufacturing’s share of GDP ranges from 33% in China to 10% in Britain (see chart).

Rich countries’ relative position may be slipping, but their absolute manufacturing output is rising quite fast. What has fallen is the number of workers needed on the factory floor. Even though some manufacturing is returning to America and Europe from places where it had been offshored, such as China, this trend will not recreate all the factory jobs that once existed.

The term “manufacturing” nowadays describes a whole range of activities. McKinsey divides it into five categories. The biggest, accounting for 34% of the $10.5 trillion total worldwide manufacturing value-added in 2010, it calls “global innovation for local markets”. This includes industries such as chemicals, machinery and carmaking, where constant innovation is essential and high transport costs for heavy goods make it sensible to produce these things close to customers.

The next-biggest, at 28%, is “regional processing”, which includes industries such as fabricated metals, food and publishing. For obvious reasons, cakes are baked locally: not just because they go stale quickly but also because local tastes vary. “Energy and resource-intensive commodities”, such as wood, paper and petrol, account for 22%; “Innovative global technologies” (chips, computers and medical products) are 9%; and “labour-intensive tradeables” (textiles, clothes and toys) 7%. These last two categories have typically been offshored by rich countries and probably will be for some time.

In the other areas where rich countries compete, there is a dark cloud building. McKinsey sees a fast-growing shortage of people with the skills manufacturers require, particularly as ageing baby-boomers retire. That is why American firms such as Dow and DuPont keep clamouring for better education in science, technology, engineering and mathematics. Yet the rich world still leads in high-tech industries. In 2010 it ran a $726 billion surplus in goods such as cars, chemicals, drugs and machinery, but it had a $342 billion trade deficit in labour-intensive tradeables.

It’s all a blur, really

McKinsey sheds new light on another old saw: is manufacturing superior to services? It is becoming ever harder to tell the two apart, as many manufacturing jobs blur with service jobs. At American “manufacturers”, 34% of jobs are service-like, rising to 55% in the global-innovative-technology sector. If one counts the workers in supporting services and those who provide raw materials, total American manufacturing employment was 17.2m in 2010, rather than the official 11.5m. Remove all service-like jobs and it drops to 7.3m.

In the future, McKinsey predicts there will be more jobs for robots. Since 1990 the cost of automation has fallen relative to labour by 40-50% in the rich world, it says. The rise of the machines will continue in rich countries, and they will make inroads into developing ones. Wages in emerging markets are soaring. One Chinese manufacturer is talking of hiring 1m robots. Still, robots need people to build, program and maintain them. Humans have no cause to hold their heads in their hands.

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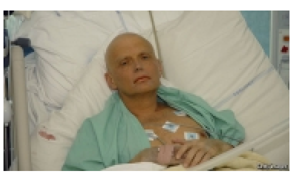

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