

TECHONOMY

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Manufacturing the Future: The Next Era of Global Growth and Innovation

Speaker:

James Manyika, McKinsey & Company

Kirkpatrick: So next, James Manyika of McKinsey who is a senior partner there is one of our best friends. He's given us tons of good advice. I'm really happy he's about to come up here to talk about the future of manufacturing and manufacturing the future. So, James.

Manyika: Thank you, David. I thought we would start by being optimistic partly because this is Techonomy and I think it's important for techonomists to be optimistic. I'm just going to read something here.

I think all too often we're suffering from a bad attack of economic pessimism. It is common to hear people say that the era of enormous economic progress, which characterized the last century, is over, and that the rapid improvement in the standard of living is going to slow down, that a decline in prosperity is more likely than an improvement in the decade which lies ahead of us.

I think we hear this a lot. What's interesting is that this was actually said in 1930 by Keynes. Keynes was an optimist and he felt this was wildly mistaken. In fact, he went on to make a prediction that over the next 100 years, the standard of living in the advanced economies—he called them progressive countries at the time—was going to go up somewhere between 4X and 8X what it was at the time..

And if you actually look at the countries that he's talking about, they have largely done exactly that. And that was back in 1930.

So I think it's very important that we remain optimistic. I was recently at a conference or a meeting like Techonomy. Now, a big part of what's been fascinating about the last history that we have lived through is that the progress that we have made has not only been faster, but at far, far greater scale. It took the United Kingdom about 150 years to double its GDP per capita. All right. The United States took 53 years. Again both the U.S. and the United Kingdom were working off a base population at the time of about 9 or 10 million. It's taken China 12 years to achieve the same thing at a far, far greater scale, 1 billion people.

So I think there's reason to be optimistic here. And one of the things that's interesting, as David alluded to, is that manufacturing has actually been a big part of the growth and progress that we're talking about.

In fact, this is just a snapshot of our current times. If you think about the progress we have made in terms of GDP growth and so forth, the contribution of manufacturing at this point in time, being pretty significant—the dark blue shows the advanced economies, the light blue the United States. So value-added growth, which is really contribution to GDP, is roughly of the order of about 12 to 15, 16 percent. Contributions to employment will all come back to that.

But right now, in advanced economies stands at about 14 percent for the United States, about 9 percent. Exports, huge contribution. Similarly contributions to private sector R&D, which is roughly about 3/4 of all the private sector R&D that happens in the economy, happens within manufacturing. Not to mention all the spillover effects that we get from manufacturing.

If you look at contributions to growth, a pretty impressive story, again working off the base of employment. But we do need to come back to the employment question because, as you can see from this chart—and we stopped the analysis deliberately just before the recession to make the point that, even before this recession, there had been a long trend of circular decline in manufacturing employment. This didn't just happen because of the recession. So that data in the United States and the advanced economies is right up until 2006.

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So what's been happening with manufacturing and employment? Well, something interesting actually happens if you look at our recent history. As economies become more prosperous, the share of employment that is attributed to manufacturing declines. So on the horizontal axis, you see those are measures of GDP per capita, juxtaposed for purchasing parity. The vertical axis shows the share of employment.

And as you can see, not just for the United States which is the red, but even for countries like Germany, which, you know, at its peak had about 35 percent of its employment come from manufacturing—even that's been going down. So there's something here about what happens to manufacturing as a share of overall employment as, in fact, as the economies become more prosperous.

So I think it's important—even as we get excited about the innovations and the recovery and the resurgence we're going to see in manufacturing—there's an historical trend here to keep and be mindful of.

So what does the future look like for manufacturing? Well, lots of—there are several important factors that are going to describe and define how this looks over the next 20 to 30 years. First of all, it's important to talk about demand. We're going to see in the next 20 years about 1.8 billion new consumers who are going to be wanting—in addition to what we have, will be buying products and services that come out of this sector.

And what's interesting about that growth is that not only is it fragmented in terms of the nature of the needs that people are going to want, it's also very global. In fact, the majority of it is going to come from emerging countries.

You have also got all the technology innovations that everybody in this room is familiar with. In fact, we heard the discussion yesterday as Rodney Brooks and Andy McAfee talking about robotics and automation. There are also other trends, as you know, 3-D printing to use of carbon fiber materials, and all material innovations that are going to occur.

So there's a tremendous amount of innovations we're going to see, as well as business innovations, more fascinated supply chains, value chains that are more resilient.

We're also going to see a new era of global competition. It's actually quite striking that, even if you just look at the last 30 years, one of the remarkable things is that in terms of capturing value-added from manufacturing, the United States has remained at the top of the lead tables in terms of value added over the last 30 years.

But we have seen lots of changes below that. So it used to be that 30 years ago, Germany was, in fact, number two, but now has dropped to about number four or five, depending on the precise date you look at. We have seen China go from number 15 to now being number two. We have actually seen new countries enter the leagues. So India wasn't on the top 15 list, now it's in the top 10.

So I think we're going to see rapid competition. The same applies to—what applies to countries also applies to companies. The companies are now competing on the global scale, so that's going to affect manufacturing.

The actual nature of work itself, what actually gets done in manufacturing will change. Again, the panel yesterday talked about robotics and automation. I'll come back to another point that has more to do with more services, but hold that thought for a second.

So I think in the work that we've been doing, it's become very clear that, as we think about the global landscape, simply thinking of manufacturing in subsegments—textiles, automotive—is actually largely unhelpful. We found that it's actually quite helpful to think about the nature of the demand as well as the inputs and dynamics in those industries.

So we see five segments. The top one—one of the top which is global innovation where the actual research and innovation happens globally, doesn't matter where, but it's mostly applied to very local or regional needs. We also have what we call

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regional processing. And then you have got very energy and resource intensive commodities, which are also part of manufacturing. That would include basic materials and so forth.

Then you've got global innovations and innovators where the products are not that differentiated. In fact, most of what we see in the tech industry fits this category. Then you have got a very labor-intensive group. The reason this is important is that, as you look at the factors that are—the factor intensity in each of these segments, it's actually quite different.

And you can start to see some of the segments where, if we do have an energy revolution, as we are talking about in the United States, for example, you can see where perhaps some of those industries may start to be relocated back in the United States.

So you can see where the energy—the sectors where energy intensity is very, very high. You also see sectors within R&D intensity and innovation is very, very high. So this starts to give you a different mosaic as companies and countries think about comparative advantage and how they can compete to their advantage. So there's a lot more to say about this, as you can imagine.

One of the other things I pointed to is the change in nature of work. And I wanted to highlight one aspect in particular. I think we often think of manufacturing as assembly jobs. Now, it turns out that in the sectors we think of as manufacturing, roughly between 30 and 55 percent of those activities are actually service activities. I think that's really important because it starts to change our perception of what we think of as manufacturing and how we think about training and skills and so forth in those sectors.

I know that the next panel is going to talk about this, about the question of traded sectors and traded services in particular. And that's actually pretty important for manufacturing as well.

Let me end with this. I think at a time when we are thinking about what happens to jobs in employment, it's important to think about the different factors that affect how companies typically think about where to locate their activities and, therefore, the kinds of things that policymakers and others should be thinking about. Clearly, labor matters. But what matters even more are the skills that go with that labor.

We know that, for example, it's going to be very difficult for advanced economies, like the United States, to compete with countries that have low—that have cheaper labor, but, however, the United States and advanced economies could compete with skilled labor categories, for example. So how you think about labor is very important.

Similarly, how we think about demand and where it is in the proximity of infrastructure is also important. There are some of these sectors where the ability to move large machinery back and forth to where demand is really requires sophisticated logistics and transportation infrastructure.

Then you've got to log the nonlabor inputs, which many people in this room spend a lot of time on. How are we going to think about energy? How we think about natural resources. How we think about intellectual property as well as innovation and some of the cluster effects.

And then, of course, it's important to think about business and the regulatory environment. That is important because, as nations start to compete, many countries are putting on the table unbelievable incentives to encourage companies to locate activities in their geographies. So it's important that we become—and we encourage policymakers to become a lot more sophisticated as we think about re-invigorating where jobs and manufacturing activities obviously get located. Thank you.

[APPLAUSE]

Kirkpatrick: Thank you, James.

Manyika: You're welcome.

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Kirkpatrick: Appreciate it. Really interesting stuff. And in fact, if there're two issues—there's an issue besides whether management gets it in business that we care about, it's what is going to happen to jobs. And you probably have felt that, I hope, in our program. And you certainly would feel it if you looked at what we did in Detroit.