

# Insights into Emerging Economies

N°4 , January 2016

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# Perspective on ...The Fourth Industrial Revolution

## Beyond the obvious



## The Fourth Industrial Revolution: an opportunity or concern for the emerging economies?

Par Joël Ruet et Fanny Costes

**For its 2016 Davos meeting, the World Economic Forum chose to spark discussion among political and economic decision-makers and civil society around the topic of the Fourth Industrial Revolution – which today is in its infancy, but tomorrow will certainly transform the way we produce, interact with others, govern and even age. It is nothing less than a global disruption affecting everything and everyone. Yet, in a world where the first three Industrial Revolutions have not yet been totally assimilated, notably in emerging countries and, more particularly, in developing countries, this quantum shift appears as a real challenge. With 1.3 billion of the world's population still without electricity, should we view this as a fantastic opportunity for faster-paced and inclusive development, or as a risk that some will never emerge?**

*«When compared with previous industrial revolutions, the Fourth is evolving at an exponential rather than a linear pace. Moreover, it is disrupting almost every industry in every country. And the breadth and depth of these changes herald the transformation of entire systems of production, management, and governance»,* writes Klaus Schwab, founder and executive director of the World Economic Forum, on his blog. As he says, the capabilities already created by the third “digital” Industrial Revolution (IR) will vastly increase thanks to technology breakthroughs in artificial intelligence, robotics, nanotechnology, biotechnology or energy storage. Advances such as these are likely to render techniques, production, decision-making, communication and energy systems more efficient, improve our living conditions and health, and also shift the “greedy” trajectories espoused thus far by the three previous IRs onto a more sustainable path.

The speed and scale of this ongoing Fourth IR are fascinating but must also cause us to ponder – especially political leaders and economic players. Even in the long-industrialized countries of Europe and America, whole swathes of the populations are now outdistanced by the Third Industrial Revolution, and by the resulting changes for communication, employment and value chains. So what can be said about the situation in emerging countries like China, India or Brazil, or those in developing countries like Africa or Southeast Asia? Will local industries be able to adapt their production tools, or are they already on the way to doing so. Could it be that starting from scratch or having less mature industrial and infrastructure systems than those in developing countries is, in fact, an opportunity? Do the authorities have the financial and management capacities to leapfrog some of the stages? And on top of the

innovations that need support, will the emerging or developing nations be able to drive the formation of human capital needed to meet the economic and societal challenge of this fourth industrial transformation? All these questions need to be asked if we are to avoid widening the world's inequality gap and, more importantly, turn this fourth and first-ever truly global industrial revolution into an opportunity for a better life everywhere.

***" It is vitally important to foster – if not the diffusion of relatively easily actionable innovations as of today – at least their adaptation to local contexts and especially their appropriation by the actors of the agricultural world."***

Looking first at India. "What does the sea change in global manufacturing, brought about by robotics and 3D printing, mean for India, where 47% of the population still work in agriculture?" asks Nicholas Davis, Head of Society and Innovation, and member of the World Economic Forum executive committee. The ambitious "Make in India" initiative needs to have enough appeal to give the country a place on the playing field; well aware of this, the Indian Government organized a day-long workshop in January on innovative start-ups... with top US names from this sector as guests.

In fact, building on a national agricultural and rural base, the Fourth IR can usher in real advances to improve crop yields, soil sustainability and natural ecosystems. As it merges technologies, blurring the frontiers between physics, biology and even the human body, it can now drive agricultural innovation, provided that the human factor and training ecosystems keep apace. In Brazil, "a real agricultural revolution is afoot. It adapts agro-ecology principles to the cultivation of sugar cane, which then becomes a "soil regenerator" enriching the soil with CO<sub>2</sub> taken from the atmosphere," comments Edouard Lanckriet, coordinator of The Bridge Tank's Nature and Capital cluster, for the magazine *We Demain*, pointing out that this practice is still at an experimental stage.

This means fostering – if not the diffusion of relatively easily actionable innovations as of today – at least their adaptation to local contexts and especially their appropriation by the actors of the agricultural world. On this count, India will need to see to upgrading these actor's skills. The rural world, however, extends beyond agriculture to include economic ecosystems that are not strictly agricultural. The cutting-edge development of solar power, mini-grids, will find its place in the Fourth IR – at the very least, it will be in sync with this technology and whole areas of the country will "leapfrog" and be able to serve as testing grounds.

In China, the actors of the Fourth IR are already in motion. Since 2014, China has become the market leader in industrial robots. Of course, this will entail a catch-up effort for the under-equipped Chinese industries and a driving thrust mainly for the fast-growing car-manufacturing sector. But the pace of catch-up and the quality of the industrial robots purchased show that China can adapt and even penetrate a market set to boom under the Fourth IR. **Large provinces such as Guangdong and the northeast provinces (Manchuria) have sized up the stakes.**

China has also turned nanotechnology innovations into a forward-looking strategy, embedding them into China's "Roadmap to 2050." A joint research agreement signed with Israel for studies in nanotechnology, 3D printing, biomedicine, renewable energy and smart cities clearly shows that the country is able to tap into surrounding sources of know-how. Its track record suggests that it will not only successfully integrate this knowledge, but certainly contribute to the ongoing Fourth IR by developing it ever further.

In sum, as the Fourth Industrial Revolution is a continuous process rather than a historical waymark, the emerging regions with their "Third IR-type" economic dynamism provide firm stems onto which the shoots of this fourth Industrial Revolution can be grafted. So, it might pose a threat for developing countries with frail economic ecosystems but not for those that have engaged with the global industry. In turn, this revolution is not limited to an archipelago of Silicon Valley-type islands, but is one that cannot be globally envisioned without the major emerging economies and, probably, their Southern markets.

# Perspective on ...The Fourth Industrial Revolution

## Press Review

**CHINADAILY** 中国日报网  
COM.CN

### Premier Li wants new five-year plan outline 'scientific, feasible'

« An outline of the 13th Five-Year Plan on national economic and social development from 2016 to 2020 is being created by the National Development and Reform Commission (NDRC), China's top economic planner. The NDRC reported the progress of the work to Premier Li on Thursday ».

#### THE Bridge Tank Take

The Bridge Tank is keeping a close eye on how the preparation of China's new Five-Year Plan is moving forward. Innovation and entrepreneurship need to be prioritized for inclusive and sustainable growth.

**CHINADAILY** 中国日报网  
COM.CN

### « A AIIB to benefit Asia and beyond » ,

#### Jin Liqun, President-designate of the Asian Infrastructure Investment Bank

Sound and sustainable infrastructure investment will lead to better development outcomes, improve the lives and livelihoods of Asia's citizens, and generate positive spillover effects in other parts of the world.

#### THE Bridge Tank Take

A key article by Jin Liqun, former Vice-Minister of Finance and regular Davos attendee. In The Bridge Tank's view, focusing mainly on infrastructure may be a mistake that could strip South-South cooperation of its originality. That said, this type of initiative could have positive spillovers that could drive infrastructure modernization elsewhere in the world.

**CHINADAILY** 中国日报网  
COM.CN

### Silk Road vision for the developing world

"Inspired by the ancient Silk Road network for trade and communication, Xi's Silk Road Economic Belt and 21st Century Maritime Silk Road will link China to the rest of Asia, and Africa and ultimately Europe. By building much-needed infrastructure across the Silk Road routes, China hopes to build "a community of common interests, destiny and responsibility". **Justin Yifu Lin, Senior vice-president at the World Bank**

#### THE Bridge Tank Take

China is increasingly aware of the capacities in developing countries that hold the seeds of the world's future potential. In The Bridge Tank's view, linking these economies into the New Silk Road development is key to ensuring a transformative, high added-value and inclusive economy.



# Focus on... The new Emerging Economies

## Pointers to emergent trends

### The new Emergents, or the key to economic diversification

After witnessing the burgeoning of very diverse emerging countries, many experts point out that new Emerging countries are now appearing. The BRICS “club” typology, though it has ultimately become a useful heuristic as these countries have now formed a group with regular meetings and its own “BRICS bank,” is nonetheless debatable. Surely, Russia counts rather as a long-industrialized country now locked into its decreasing energy rents, while Brazil with its promising technologies seems to have fallen victim to its sudden oil windfall and consequent ousting effect on modernization? So, many voices are now highlighting the potential of countries such as Indonesia, Mexico and Turkey to enter into this new economic category. As such, this clearly puts an end to the dual classification between developed and developing countries.

Nonetheless, we believe that designating a country as an Emergent should not be solely based on GDP growth dynamics or a country’s economic catch-up effort, but primarily on its ability to both diversify its economic, and particularly its industrial fabric, and develop resilient local ecosystems. Some emblematic cases advocate this point.

First of all, let’s take a brief look at China or even Brazil. China has been and is still going through a catch-up phase, often in the limelight because of its reputation as the world’s workshop. But, at the same time, it has managed to capitalize qualitatively on massive foreign investment flows, channel its own investments into forward-looking sectors and technology, and diversify its economy. Today, China can claim to be in the global aeronautical race, although for some 50 years the airline market had been divided up between the giants, Airbus and Boeing, with the Brazilian Embraer having a marginal share. It also has a great hand to play in the nuclear and infrastructure sectors. And what about its dominant position in renewable energies, where its capabilities span rare earths exploitation through to the manufacture of solar panels and wind turbines. Not to mention its cutting edge R&D focused on robotics and, more recently, nanotechnology and supercomputers, as well as its ventures into new materials.

As for Brazil, while all of the indicators now point to decelerating growth, mainly due to a sustained fall in commodity prices, we consider that the Brazilian model has the means to face up to the partial deindustrialization connected to its growing trade commitments with China. It is true that this Latin American country is suffering from the adverse effects of its oil revenues, direct competition from China, the Workers’ Party’s (PT) waning legitimacy, and an insufficiently diversified economy. But the comparative benefits it has derived from sectors such as sugar cane, by setting its bets on first- and second-generation biofuels, and its rich R&D ecosystem would suggest that Brazil is still in the running on the path of sustainable emergence.

These two very different countries have of course experienced significant growth for a good number of years, with GDP per capita growth rates increasing in leaps and bounds and a fast-growing middle class. They have also attracted floods of FDI, which is typical characteristic of the original “emergence” concept. But what characterizes their emergence as economic rather than simply financial is their well-developed and varied industrial structures, their diversified economies (particularly in China), which rely on the natural, technical and human assets of their local ecosystems, and a genuine capacity to innovate thanks to ambitious R&D programs. In short, their dimension of economic “laboratories”.

According to our think tank, two African countries have embarked on development paths that meet these “criteria”. The first is Morocco. Because it has not locked itself into subcontracting for foreign equipment manufacturers. It is deploying a strategic vision of inter-sector integration, as exemplified by



A world map with several countries highlighted in different colors to represent emerging economies. Mexico is highlighted in green, Morocco in yellow, India in blue, and China in red. The rest of the world is in shades of grey.

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## Pointers to emergent trends

the Green Morocco Plan for agriculture or the Moroccan solar energy plan, a real vision to drive the automotive industry and, today, the aeronautical equipment. This means that extra value-added can be created on top of that provided by foreign investment, and that interesting synergies with reputed industrial players can be developed.

Ethiopia is also an interesting case in point. In addition to 10% growth over a ten-year stretch, the measures put in place to fast-track industrialization, equip the country with modern infrastructure, and supply green energy are likely to lead to the emergence of this country – again African. Since 2011, the policies introduced to develop the textile and footwear industries have spawned over a hundred new textile factories in the space of a few years, and helped to revive the country's declining cotton production. In the area of infrastructure, major projects are now underway: roads and also hydroelectric stations. Since 2009, estimating that climate change has already resulted in a 2–6% loss in GDP, the country has begun to develop an official Climate Resilient Green Economy (CRGE). It has also launched the construction of the Grand Renaissance Dam on the Blue Nile River, which will have a capacity of 6,000 MW by 2017. The project will even enable Ethiopia to export electricity to its neighbors.

Mexico and Turkey, often cited as new Emergents, both have their strengths, as confirmed by the investments they attract, but their potential to emerge remains fragile. This is less obviously the case for Mexico. Although many consider Mexico's privileged trade relations with the United States to be a strong point, we suggest that the country has underestimated the vital need to develop both its domestic market and high value-added industrial sectors and local clusters. As for Turkey, while firms are indeed becoming increasingly international, the country's internal weaknesses are more pronounced. Not only is the currently topical geopolitical situation creating uncertainty for foreign investors, but, above all, Turkey has relied heavily on its real-estate sector, which is currently stalling. It has not diversified its industry and neither has it tackled the urgent issue of energy.

More generally, the impact of declining commodity prices on emerging countries or "candidate" Emergents underlines the need for them to diversify, to upgrade their production capabilities within the value chain, and to rely on regional ecosystems, in a global context where, due to currency wars and resource price volatility, export no longer stands as the sole and much sought-after growth engine. Moreover, in the long run, industrial diversification is what offers the means not only of absorbing a diversified workforce, but also of driving and supporting workforce training, the key to forging a link between technical and human capital.

\* For more on this topic, download our Policy Brief No. 2 (in French): "Energy transitions: an opportunity to enhance regional industrial trajectories" [Read more in french ...](#)

# Focus on... The new Emerging Economies

## In brief

### Post COP-21: a very "green" week in the Emirates

This year's Abu Dhabi sustainability week, organized by Masdar from 16 to 23 January 2016, brought together over 32,000 participants from over 170 countries. The purpose was to discuss energy challenges, promote dialogue between the different industrialists and thereby strengthen strategic partnerships. With this in mind, Bridge Tank president Joël Ruet exchanged ideas with Seyni Nafo, the youngest negotiator at the United Nations Framework Convention on Climate Change (COP-21), for the Africa Group. A key issue that came up in the discussion was the need for COP-22 to focus on shared innovation and, more specifically, African innovation. Joël Ruet also stressed the importance of a long-run vision for energy, calling on renewable energy development, with one of the goals being to keep in check the impact of volatility in fossil fuel prices.

### A booming electric car market



With a lion's share of its domestic market, the Chinese company BYD (Build Your Dream), which specializes in renewable batteries and electric vehicles, has just become the world's top-ranking car manufacturer for electric vehicle sales, ahead of Nissan, Toyota, and Tesla. Competition in electric mobility reflects a firm determination to modernize our means of transport, which not only helps to drive a market open to advances in electric cars, but also speeds up measures to support renewable energies. A dynamism that clearly indicates what will constitute the foundations of a green and sustainable Fourth Industrial Revolution. Leaders at BYD are aware that this positioning will mean taking on an international dimension on a par with its competitors, notably in Africa and the MENA region, as their position has largely been gained through their Chinese domestic market.

### India to bring in tighter depollution norms in 2020

In early January, India announced that it would skip the emissions standard, Bharat Stage (BS) V, and move straight to BS VI, which is equivalent to Europe's Euro 6.

With its major cities facing high levels of air pollution, India has decided to react ambitiously, although today vehicles sold in the country are BS III- or BS IV- certified depending on the region. A first move will come in 2017 when all vehicles will have to comply with BS IV so as to introduce a national standard.

The country has already taken other measures to modernize mobility. Already in November 2015, ahead of COP-21, the Indian Minister of Environment and Forests, Prakash Javadekar, told Radio France Internationale: "We are promoting electric vehicles, and for this, we are offering a 20% subsidy for each vehicle. We have also passed a law to put 100,000 electric rickshaws and tricycles on the road."

# News and Events

The Bridge Tank's voice

## The Bridge Tank in the media

- "The Brazilian model is not yet completely 'sustainable', but it is constantly evolving and mapping out a pathway unique in the world. If Brazil's strategy succeeds – in other words, the creation of an industrial base powered by energy and molecules sustainably produced from renewable local resources – the country will have successfully set up industries that 'repair' the environment and store CO2 as they operate."

Edouard Lanckriet, coordinator of The Bridge Tank's Nature as Capital cluster, from his article «Brésil : Des agrocarburants bons pour le climat...et les sols tropicaux», We demain, 8 january 2016

- «Economic slowdown or not, many of tomorrow's markets are still springing up in emerging countries, comments Joël Ruet. They will be pioneers in system technologies and innovations. As so-called 'South-South' cooperation initiatives increase, they no longer always count on Western businesses.»

L'Usine Nouvelle n°3449, 17 December 2015, from the article « L'histoire continue... » by Pierre-Olivier Rouaud

## THE BRIDGE TANK TOUR

**20 – 23 January 2016** : World Economic Forum – Annual Meeting, Davos , Switzerland

**13 – 18 February 2016** : Make in India Week, Mumbai , India

**18 - 20 February 2016** : 16th edition of the Forum de Bamako, Mali. Theme "Africa between chaos and emergence"



### Non-aligned capitalisms, by Joël Ruet

« The thesis developed in this book is that emergence exists as a sound economic concept, and exhibits identifiable regularities. These are not the low costs prized by relocating firms, or the longed-for homogeneity of the middle-classes that serve unbridled marketers as consumption relays. They are rather the regularities of industrial processes that constitute the enabling pillars of a dynamic "category of emergence". The fact is that emergence is to be found by first looking at the actors' diversity and observing not just standardizations, but the ongoing rebalancing around active hubs that each leave their imprint on every country. However, you need to go through the factory door for emergence to reveal itself. Emergence is a laboratory.»

From *Des capitalismes non-alignés*, by Joël Ruet, Editor: Raisons d'Agir, in press  
<http://livre.fnac.com/a8634606/Joel-Ruet-Les-capitalismes-non-alignes>