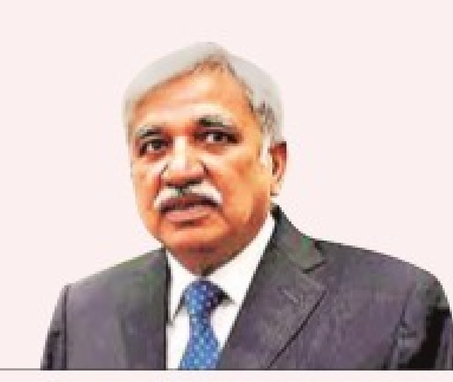
Opinion

MONDAY, MARCH 4, 2019



EVMs TREATED LIKE FOOTBALL

Sunil Arora, Chief Election Commissioner

EVMs are being used for the past over two decades. We have made EVMs football, knowingly or unknowingly... If result is X, then EVMs are okay, and if it is Y, then the EVMs are faulty

GDP slowdown to worsen, more rate cuts likely now

Slowing global growth will hit exports and the NBFC crisis has hit consumption, as has poor agriculture growth

GOING INTO AN election with GDP slowing for two quarters (it will be three once the Jan-March numbers come in) and at a 6-quarter low can't be good news for a government, though the flipside is that the central bank can be expected to make another two rate cuts of 25 bps each over the next 2-3 monetary policy reveiews due to sluggish growth and inflation remaining below target. From 8% in Q1FY19, GDP growth fell to 6.6% in Q3FY19—the last time growth was so low was in Q1FY18 when it clocked 6%. In fact, the quarter-on-quarter growth is the slowest in five years if you exclude the demonetisation quarter of FY17.

Much of this, of course, was to be expected and, indeed, the signs of how the Jan-March 2019 quarter will turn out are evident from the sluggish growth in aggregate credit, automobile and property sales. Weak agriculture growth is an obvious problem area and, given close to half the work force is employed in the sector, has implications for how sustainable private consumption can be. With growth in agriculture in FY19 now likely to be around 2.7% according to the latest GDP numbers—just a month ago, the FY19 estimate of agriculture growth was put at 3.8%—as compared to the 5% growth seen in FY18, this is a 46% slowing of growth. Indeed, with agriculture growth in the four years of the Modi government just 2.9% as compared to 4.3% in the UPA-2 period, the consumption bump was never going to sustain; more so if the common perception of a slowdown in jobs growth, or even a contraction, is correct.

The simmering NBFC crisis is another reason for the slowing of consumption since a lot of consumer durables were financed by this sector that is now paying the price for its scorching growth, while not paying enough attention to how sound the lending was. While the slowdown in NBFC lending appears to have been made up by a rise in bank credit growth, a lot of this is simply refinancing and so, the net availability of credit in the economy remains constrained. And with real estate sales far from picking up, and most real estate companies in trouble either because they overextended themselves or because the owners siphoned off funds, the NBFC crisis could get worse before it gets better. Indeed, while RBI's attempt was to ensure no NBFC lacked funds when the IL&FS crisis first erupted, RBI has now raised risk weights so as to ensure that banks don't over-lend to NBFCs without taking into account the risks.

While a good exports performance, mostly due to the rupee depreciating, ensured that the drag from net exports reduced in Q3FY19—from 3.6% in the March 2018 quarter, exports growth jumped to 14.6% in the December 2019 quarter—this is unlikely to endure as global growth is slowing, and the world is also getting more protectionist. While the government could spend more in the fourth quarter of the year—growth in government expenditure fell to 6.5% in Q3 from 10.8% in Q2—it is unlikely that this alone can boost GDP growth. There has been, though, a slight pick-up in investment growth and the recent set of reforms—six airports were privatised, oil and gas pricing was eased and a new mining policy has been cleared, amongst others—is aimed at increasing this further. How soon this will take place, though, is not clear since sectors like telecom, for instance, are in trouble, and the power sector mess hasn't improved either; indeed, as a proportion of GDP, FDI inflows continue to contract due to the unfriendly policy environment. In any case, no serious pick up in investment levels can be expected till the next government—even if it is the NDA coming to power again—is sworn in and investors get a sense that the investment regime is getting better.

Will Trai ever get it right?

Vodafone CEO raises embarrassing issues for government

GIVEN HOW RJIO is grabbing market share so aggressively, it is easy to dismiss Vodafone Global CEO Nick Read's comments on the telecom regulator's (Trai) decisions hurting all telcos except RJio as typical of a loser. But it is not just Read, Trai is accused of bias by the appellate tribunal (TDSAT) and the Supreme Court. And telecom's highest policy-making body, the Telecom Commission (TC), has also found fault with Trai on many occasions; TC has asked Trai to explain how it reached the conclusions it had on spectrum pricing—the higher the reserve price, the more it hits telcos who are not as cash-rich as RJio—but Trai refused to do so.

One of the issues raised by the older telcos was Trai's sharp 57% cut in IUC levies. While Trai had justified this by arguing that newer-generation networks—like RJio's—had lower termination costs, this made little sense since India had legacy networks as well. While the telcos' challenge to this is pending before various courts, what is amazing is that Trai never even shared its costing model with the telcos. How can a regulator be so opaque? At another point, Trai suggested heavy penalties for call drops and, a month later, it came up with a technical paper that explained why telcos weren't entirely responsible for the call drops! When SC ruled on this, it said "a legislatively pre-determined penalty, without fault or loss being established ... (is) manifestly arbitrary and unreasonable'; it went on to say '(Trai) must respond in a reasoned manner to (comments) that raise significant problems, to explain how the agency resolved any significant problems raised by the comments, and to show how that resolution led the agency to the ultimate rule...including a rational connection between the facts it found and the choices it made".

In 2016, Trai recommended a ₹3,050 crore penalty on telcos for not providing enough Points of Interconnection (PoI) for RJio. TC pointed out that telcos had 90 days to provide PoIs and had done so within this period. Trai later came up with a consultation on whether a 90-day period for providing interconnection was too long. An internal committee of TC has come out against the penalty—which is why no decision has been taken on the penalty for so many years—making it clear even the government is not convinced Trai is right. And when Trai was examining the issue of predatory pricing, it said a telco must have a market share of at least 30% to be even investigated for predatory-pricing. While ruling on this, TDSAT said Trai's definition of significant market power (SMP) showed "a degree of pre-determination to dilute the entire concept of SMP", it was "arbitrary without any deliberation and effective consultation", that it was "not backed by any intelligible and objective criterion nor any convincing reason" and so was "an extreme step and unnecessary abdication of its regulatory powers by TRAI". TDSAT went on to add, that the Trai's ruling provided "artificial protection to a TSP (telecom service provider) who may have the capability and intent to destabilise the sector through predatory-pricing". Instead of asking Trai for an explanation when it was pulled up so often by the country's courts, the government reappointed the Trai chief after his term ended. And, yet, telcos are expected to consider Trai a neutral umpire.

Clean-upACT

Delhi does well to give sanitation workers sewer cleaning machines, states/Centre must take a cue

THE DELHI GOVERNMENT, last week, handed over 200 sewer cleaning machines to skilled manual scavengers. Given the sanitation workers can use them even when their services are hired by private parties, it makes them 'sanitation entrepreneurs'. Developed by the Delhi Jal Board, the small vehicles have been fitted with machines to carry out hydraulic jetting and grabbing work. These can clean manholes 30 feet deep, while the silt and slurry is collected safely for disposal. Delhi's initiative is in sharp contrast with the mere tokenism embedded in the prime minister washing the feet of *safai karamcharis* (sanitation workers) at the Kumbh Mela even as manual scavengers and other sanitation workers have been protesting for safer working conditions.

Manual scavenging remains a blot on India's governance even though it was outlawed 25 years ago. Since 2017, one manual scavenger has died every five days, as per data from the National Commission for Safai Karamcharis. The larger share of the blame for this must lie with the states because not only have they done little to move to mechanised sanitation work that doesn't chip at workers' livelihoods, they routinely under-report the population of manual scavengers. While the legal definition of "manual scavenger" excludes septic tank and sewer-line cleaners, given the nature of the work, it is often the same people who do manual scavenging and septic-tank/sewer line cleaning. The Centre can't escape its share of the blame, given the largest single employer of manual scavengers is the Railways. While the Supreme Court has, on several occasions, directed the Centre to take steps towards the monitoring and implementation of the ban on manual scavenging, this hasn't been effective. It is time the Centre and the states followed the Delhi government's example.

FROM PLATE TO PLOUGH

IN ORDER TO DOUBLE FARM INCOMES BY 2022, THE REQUIRED RATE OF GROWTH IN AGRI-GDP AND AGRI-HOUSEHOLDS' INCOME IS 15%, A FAR CRY FROM THE 2.9% ACHIEVED BETWEEN 2014-19

The Modi govt's agri-record is mediocre

ASHOK GULATI & RANJANA ROY

Gulati is Infosys chair professor for agriculture and Roy is a consultant at ICRIER

THE CENTRAL STATISTICS Office (CSO) has released second advanced estimates of national income for 2018-19, along with quarterly estimates of GDP (Q3). The overall GDP growth for Q3 is down to 6.6% and for the whole year (2018-19), GDP is expected to grow at 7%, a notch lower than the 7.2% achieved in 2017-18.

Our concern, however, is with agriculture performance, which engages almost 47% of India's work force, and its growth has significant influence on poverty. The growth of Gross Value Added (GVA) at basic prices from the 'agriculture, forestry and fishing' sector is expected to be 2.7% in 2018-19 as against 5% in 2017-18, registering a massive drop of 46%. The CSO clearly states that GVA for this sector has been compiled using the Second Advanced Estimates of production of crops for 2018-19, but in case of the livestock sector, estimates are taken from production targets for milk, eggs, meat and wool. Generally, targets are more optimistic than what turns out to be the reality!

It is normally agreed that the year-on-year growth rates of agriculture fluctuate much more than overall GDP growth rates, as almost 52% of our cropped area is still dependent on monsoons. So, year-on-year comparison can be misleading. Thus, we look at the five-year performance of agriculture under the Modi government and compare it with the regimes of earlier governments, starting with the Narasimha Rao government that ushered in economic reforms in 1991 (1991-92 to 1995-96). We avoid the two years of 1996-97 and 1997-98 which saw three prime ministers (Atal Bihari Vajpayee (first time), Deve Gowda, IK Gujral). But we take 1998-2003-04 (Vajpayee government); 2004-05 to 2008-09 (UPA-1), 2009-10 to 2013-14 (UPA-2) and 2014-15 to 2018-19 (Modi government).

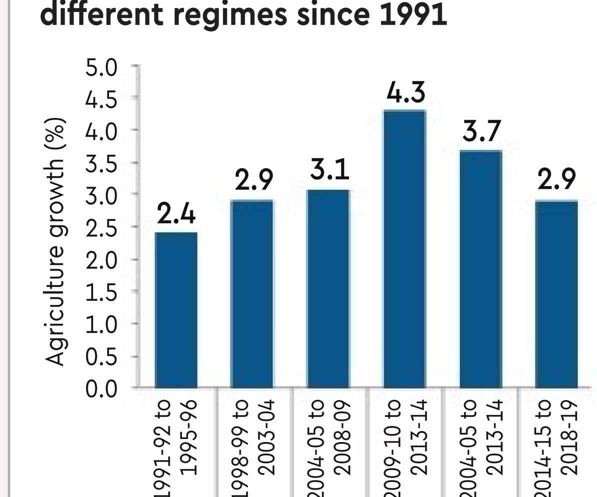
As can be seen, Modi government's record in agriculture performance is very mediocre: At 2.9%, it is better than the 2.4% achieved during Narasimha Rao's period, equals the performance during the Vajpayee period, is a notch lower than the 3.1% of UPA-I but significantly lower than the 4.3% growth rate achieved during UPA-2. Looking at these growth rates over a longer period is important because the real incomes of agri-households (agri-HHs) move in tandem with overall agri-GDP growth. This is also important to note in the light of the much-talked about ambitious target of doubling farmers' incomes by 2022-23, as declared by the Modi government.

The attached graphic also presents the monthly incomes of agri-HHs in major states of India and for all India, as estimated in the NABARD's latest survey on financial inclusion, often called the NAFIS for 2015-16 agricultural year. Punjab agri-HHs had the highest monthly income of ₹23,133 while Uttar Pradesh, with ₹6,668 is at the lowest rung. Overall, at an all-India level, the average income of an agri-HH in 2015-16 turned out to be just ₹8,931 per month. The compound annual growth rates (CAGR) of real incomes between 2002-03 (NSSO survey) and 2015-16 (NABARD survey) comes to 3.7% at the all-India level, with a high of 8.4% for Odisha (though with a low base) and minus (-) 2.3% for J&K agri-HHs. It may be noted that the CAGR is very much impacted by the base or terminal year's performance of agriculture. It is interesting to see that the CAGR of agri-GDP for the period 2002-03 to 2015-16 is 3.8% while CAGR of agri-HHs incomes is 3.7%.

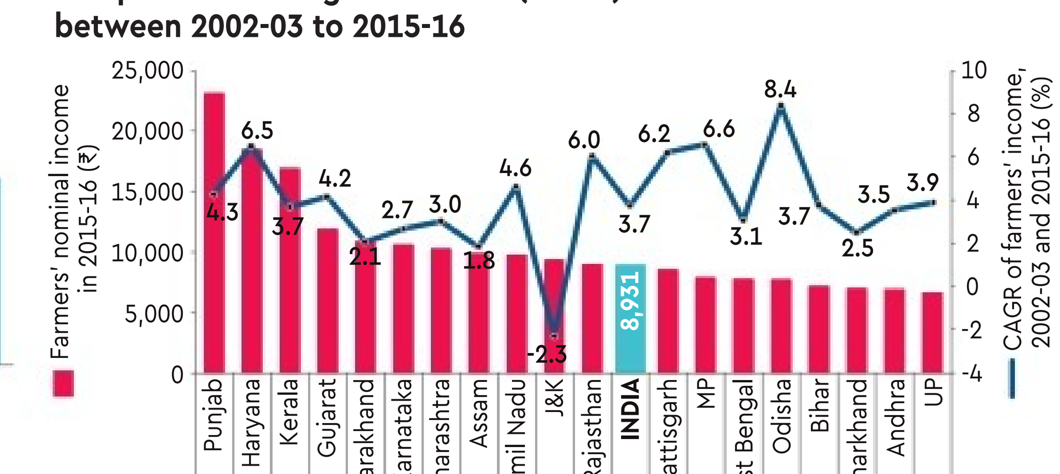
The Expert Committee headed by Ashok Dalwai on Doubling Farmers' Incomes by 2022-23 estimated that the required rate of growth would be 10.4% per annum with a base of 2015-16. Now, three years are coming to a close from that base of 2015-16, and there are no signs of any acceleration in growth rates of agri-GDP during the Modi government period. In fact, it has decelerated to 2.9%. What this implies is that in the remaining four years left till 2022-23, the required rate of growth in agri-HHs' incomes and agri-GDP growth would be about 15% per annum. This is almost impossible, given whatever policy instruments the government has applied so far, including the latest PM Kisan scheme of giving ₹6,000 per annum to small and marginal farmers. And this does not auger well for the Modi government seeking re-election. Dreaming big is good provided one is able to mobilise resources and policies to unleash 'animal spirits' in agriculture. So far, one cannot see that.

Instead, what one sees is rising anger and restlessness amongst peasantry, which is forcing several states to loosen up their purse strings, announcing loan waivers and/or direct income support. Of course, there is a lot of politics in these freebies, a sort of bait for votes, but there is also a genuine simmering discontent amongst peasants due to falling profitability in several crops that needs to be addressed. Time has run out for the Modi government, but whichever new political set up takes shape in April-May 2019, it is better for them to start early on the path of structural reforms in agriculture, from agri-marketing to opening up land lease markets, to rationalisation of food and input subsidies (fertilisers, power, irrigation, insurance, interest subvention), and putting in more money in innovations that can ensure not only higher productivity in agriculture but also its sustainability and profitability. And finally, it may be advisable to shift the target date for doubling farmers' incomes from 2022-23 to 2029-30, which will be more realistic and achievable, and grounded in reality.

Performance of sgriculture under different regimes since 1991



Level of monthly income of agri-households (2015-16) and compound annual growth rates (CAGR) in their real incomes between 2002-03 to 2015-16



Source: NSSO and NABARD

Why 5G will arrive with a whimper

The irony is that early 5G looks more like an extension of 4G than the cataclysm that has been promised. The full potential of the technology won't be exploited until it finds its way into smart factories and power grids

ALEX WEBB

Bloomberg

NOT ALL 5G is created equal. That is the takeaway from this year's Mobile World Congress, the telecommunications industry's annual confab.

Set aside the furore around Huawei Technologies Co. Ltd. for now. I want to talk about how the next generation of mobile connectivity is being rolled out and used. The irony is that early 5G looks more like an extension of 4G than the cataclysm that has been promised. The full potential of the technology won't be exploited until it finds its way into smart factories and power grids.

The first networks will arrive this year. At the show in Barcelona, Sprint Corp. joined rivals AT&T Inc., Verizon Communications Inc. and T-Mobile US Inc. in outlining plans to roll out 5G in nine US cities in the first half. Firms in South Korea and Japan have similar ambitions, and trials are under way in Europe.

But the case for consumers and companies to use these networks look thin as of now. The greatest immediate benefit will be to the carriers, which can use the technology to keep costs down and prices high. In the US, where average revenue per user is gradually dwindling, it should make it easier to justify charging as much as $100 a month for a mobile contract. And as the growth of online video creates a surge in demand for data, it costs about half as much to deliver that content with a 5G network than over 4G.

The technology looks, therefore, to be about delivering large chunks of data efficiently rather than quickly. But that is not necessarily a problem, since there is little demand, as yet, for the low latency (read: super-fast speed) that 5G can provide.

Of course there were the gimmicks: seemingly every company had musicians collaborating over a 5G network, because the absence of any time lag means they can. And there were handsets from Samsung Electronics Co., LG Electronics Co. and Huawei. Those product launches seemed, if anything, to be a tacit admission that customers are buying new phones less regularly. Given that most people won't have access to 5G networks for several years, it seems to suggest the life-cycle of each handset is extending to three or four years, rather than the two years that have been typical of the past decade.

> **The greatest immediate benefit will be to the carriers, which can use the technology to keep costs down and prices high**

But it was clear from most demonstrations where companies expect the real demand for 5G to come from: business and industry—things like water quality monitors, adaptive robotics and augmented reality for field engineers.

Even Magic Leap, the augmented reality start-up that has raised $2.3 billion from investors including Google and JPMorgan Chase & Co., announced something of a pivot. Having long been adamant that its headset was targetted primarily at artists and creatives, the firm said it will now target business applications.

It is the nature of these conferences that the technology on display won't become widespread for several years. So the network gear the firms showed off in 2018 is only just being deployed this year and next. You can infer the same for the industrial applications—they will take time. Nokia Oyj estimates that there are 7 billion connected devices today, mostly cell phones, but that number will surge to 100 billion by 2025 as factories, cars and household appliances get connected.

The first step of 5G should be good news for carriers, as long as governments don't force them to spend too much money too quickly on the roll-out. They should be able to reduce costs and plump up prices. But it will only be when 5G's industrial applications start to become widespread that the revolution will really begin.

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LETTERS TO THE EDITOR

Fair deal, wanna bet?

With recent regulatory amendments, sports betting is found to be developing as an alternative/legal means of investment in the economy. However, it is important to regulate the booming gaming industry to curb malpractices and round-tripping of money. Although a largely erratic/seasonal business, the developing segment can increase revenues from tourism and other related services, provided robust anti-money laundering norms are enforced to monitor the source and placement of funds. However, social cognisance of by-products that are largely unapproved of viz. addiction, poor loss management, inconsistent returns, lower control over outcomes and incidents of duping is highly necessary. Targetted norms along with a balance between higher risk appetite and disciplined responsibility while gambling therefore assume importance

— Girish Lalwani, Delhi

Rahul jumps into top 10

Indian opener KL Rahul showed his outstanding performance playing against Australia in Bangalore. he scored runs in both the T20I games scoring 50 in the first and 47 in the second. Obviously, it is nice to be back as well as he was the lone Indian to feature in the top 10 batting list even as Afghanistan' s Hazratullah Zazai jumped 31 spots to be placed at a career-best seventh position in the latest ICC T20I players ranking issued

— MM Iftakhar

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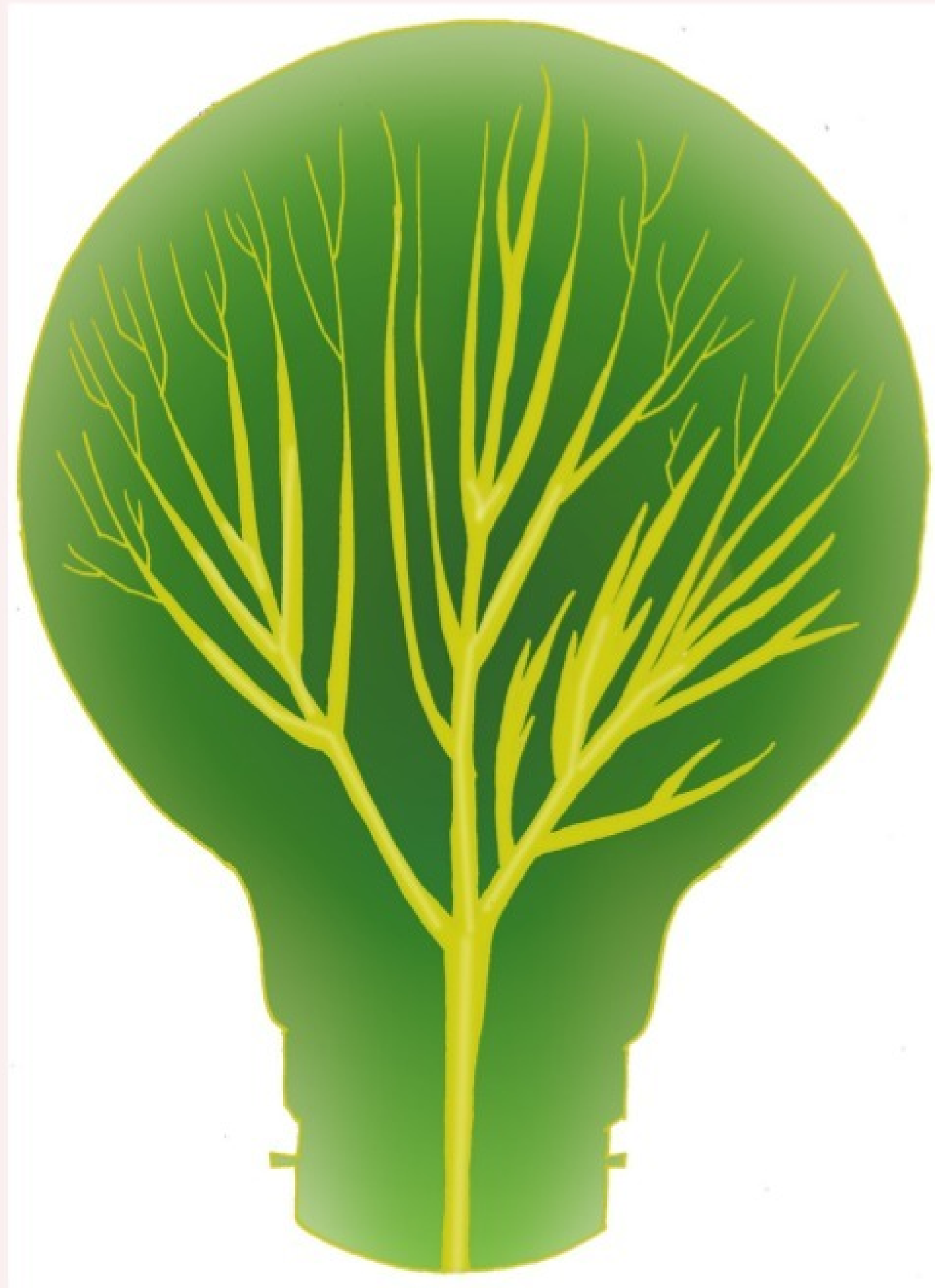

ILLUSTRATION: ROHNT PHORE

OVER THE BARREL

VIKRAM S MEHTA

Chairman & senior fellow, Brookings India. Views are personal

Learning from Ocasio-Cortez on climate

US Congresswoman Alexandria Ocasio-Cortez was able to generate a lot of buzz over her climate resolution because she got the timing, the language, and the message right. Recent climate-change-related disasters were fresh in the mind of Americans and the resolution avoided complex climate terminology and, instead, intended to mobilise action

A 29-YEAR-OLD US Congresswoman, Alexandria Ocasio-Cortez, representing the New York boroughs of Bronx and Queens, has shot into public prominence in the US for a non-binding resolution that she and her Democrat colleague Senator Ed Markey from Massachusetts have tabled in the US Congress.

What is surprising is that there is nothing remarkable about the resolution. It contains a package of oft-discussed ideas on how to decarbonise the US economy. And even the caption "the Green New Deal" has been mentioned before. The *New York Times* columnist, Thomas Friedman, used this phrase in a column that he wrote in 2007 about clean energy. Yet, the young rookie politician is today the cynosure of her seniors in the US Congress; her resolution has won the support of several presidential hopefuls and the "old new ideas" on global warming have acquired traction.

Several questions arise. What is the reason for her success? Why has this resolution struck a chord? What lessons, if any, does the Cortez phenomenon offer Indian politicians who wish to embed climate change more deeply into our policy fabric?

Victor Hugo said, "nothing can hold back an idea whose time has come." His insight focused on two issues. The idea and the timing. A "good" idea would be no more than just that if introduced at an inopportune time. It could be transformational if supported by context and circumstance. The response to Cortez's resolution suggests the importance of a third factor: Language and message.

The road to decarbonisation has been well marked over the years. The milestones are known. Electricity must be decarbonised by basing it on solar and wind; industry furnaces should be powered by solar and heat; the internal combustion engine should be replaced by electric vehicles; residential homes and buildings should be redesigned to make them carbon neutral; clean energy technology should be generously funded, etc.

The distance covered so far down this pathway has not however been much. The IPCC "special report on global temperature of 1.5°C", published in October 2018, made clear that the world has a long way to go before it achieves its objective of containing temperature-rise to below-1.5°C, and that this objective will only be achieved if it accelerates the implementation of the ideas that secure "rapid and far reaching transitions in energy, land , urban and infrastructure and industrial systems" and thereby "deep emission reductions".

The reasons for this slow pace are many, and country-specific. The US, for instance, has stumbled because of the ambivalence of political leaders towards global warming; the varying interpretations of scientific data and the counterfactual physical experience. US president Donald Trump is openly derisory. "Wouldn't be bad to have that good old fashioned global warming right now" was his tweet from the US Mid West where temperatures had fallen to Arctic levels.

But one reason common to all countries for the disjunct between the idea of decarbonisation and its implementation has been the absence of broad-based public—and, therefore, political—support. The green agenda has all too often been introduced at an inopportune time or through an ineffective medium.

The Cortez phenomenon offers a sense of what is possible if both timing and medium juxtapose to leverage and compliment each other. Her resolution was, for instance, well-timed. It was introduced at a time the US public was still unsettled by the spate of natural disasters that had hit the US. The fires in California last year were the worst ever, leading to considerable loss of life and livelihood. Moreover , it was no longer possible to ignore the mounting scientific evidence of global warming and the forewarning of scientists that the window of opportunity for managing the consequences was fast closing. But beyond timing, Cortez leveraged the power of language. Instead of complicating the understanding of the public by discussing arcane and the still somewhat controversial issues of carbon pricing, sequestration technology, nuclear energy and financing structures, it called for a "10-year national mobilisation" plan for reducing carbon emissions. The medium was a simple war cry.

The Cortez resolution may eventually end up in the archives like so many other resolutions on the same subject, but today, at least, it has to be credited for bringing global warming into the US national conversation.

What is the takeaway, if anything, for India from the Cortez resolution? I ask this question only because I believe our public has still not fully appreciated the implications for India of global warming. And that is a worry. For, India will be amongst the worst affected countries in the world if sea levels rise, glaciers melt and temperatures fluctuate between extremes. There is, therefore, an urgency in raising public awareness about this issue.

All governments for the past two decades have made an effort to tackle the challenge of climate change. The UPA government set up the National Action Plan on climate change in 2008,

The UPA government set up the National Action Plan on climate change in 2008, and established a number of climate change missions. The current government made a comparable, if not, larger effort. But neither has been to able to elevate this issue to a national priority and bring it into the public and, therefore, political discourse

and established a number of climate change missions. The present government made a comparable, if not, larger effort. They set ambitious targets for solar and wind power; they provided incentives for EVs; they set a timeline for the cutting of emissions by utilities and also benchmarks for energy efficiency; and they replenished the "clean energy fund " for financing clean energy through an increase in the coal cess. But no government has been to able to elevate this issue to a national priority and to bring it into the public and, therefore, political discourse.

The Cortez resolution offers a clue on how this could be done. The subject must be brought onto the legislative agenda. The new governments should introduce a bill—call it "the climate change and clean energy Bill"—that sets out a time-bound objective for decarbonisation. The language of the bill must be exhortatory. Its purpose should be to educate and mobilise. It should be to bring climate change into the national conversation and create the opportune time for implementation of the ideas already on the agenda.

Blockchain gains for food industry

KUSHANKUR DEY

Assistant professor, Indian Institute of Management, Bodh Gaya. Views are personal

It will help farmers/producers realise a larger share in the consumer's spend

APPLICATION OF BLOCKCHAIN in agri food industries is gaining ground as consumer awareness of food safety has been increased. On one hand, credible information increases the search costs for consumers, and on the other, demand for more food information reflects transparency and lack of trust. Related information and compliance issues for agri food industries are emanating from costly and inefficient paper-based transactions, fraud, corruption and error on physical and technology-driven systems, integrity of digital repository, and double-spend of certificates.

So, is blockchain a timely solution for agri food industries in terms of efficiency gains through improved coordination? It is clear that blockchain is becoming a tool for greater transparency on food for the consumer. Will consumers be ready to pay a price for it? If the industry raises the price, then the marginal gains are to be distributed to the downstream actors such as producers and aggregators. These issues are to be resolved at the regulatory and policy level.

A 2018 policy paper by FAO proposed that blockchain technologies can enable an immutable contract between the various supply-chain actors and instil transparency. Further, the contract can reduce the density of supply chain network by removing the 'not so complementing' intermediaries. As a result, this can reduce transaction costs, improve margins, and induce efficiency and eventually deliver a larger share of the consumer's spend to the farmer/producer.

In India, a consortium of food companies has tied up with tech giants to make food supply-chains transparent and traceable. Blockchain is seen to be critical on assaying quality and can help businesses comply with regulatory standards. A number of grape-exporting businesses from western India have evinced interest in blockchain to improve quality checks of containers and comply with sanitary and phytosanitary standards to realise export potential.

Tripoli & Schmidhuber (2018) in the FAO's policy paper illustrated key features of blockchain technologies.

■ Blockchain disintermediates processing and storage of data entries and verifies transactions by using peer-to-peer consensus mechanism to facilitate agreement between participants on the status of data in the decentralised network. The mechanism uses validators (participants), incentives and consensus algorithms to validate transactions or data entries in the shared ledger. The method of validating data entries offers greater cost-efficiency, lower fees and faster transaction—payment-cost structure (Cant et al., 2015).

■ Blockchain technologies use cryptography (crypto anchors) to ensure immutability and security for data entries. Each data entry is recorded with a timestamp and a cryptographic fingerprint of that record that links each record to one another, and is then stored securely across the distributed network of computers.

■ The immutability of records and disintermediation of data storage, through a shared ledger, make every transaction or record in a distributed ledger time stamped, traceable, transparent. In theory, all participants of the distributed ledger should have access to the full transaction history registered on the database. The information stored on the ledger is protected by encryption and managed with private and public keys. These distributed ledger technologies can be of permissioned and permissionless.

The *Wageningen Economic Research* report, in 2017, presented findings of a pilot on the application of blockchain by Dutch agri-food industries. It presented a roadmap on the adoption of blockchain. Food producers can add value to their produce due to increased transparency and attributes of product credence. Through an enhanced traceability of their produce, producers can access institutional credit and enter smart contract with processors and consumers. They can realise a fair price due to less interference of traders or middlemen. Other stakeholders in the blockchain ecosystem are certification agencies, government organisations, retailers/traders, producers of digital equipment, knowledge institutions, agro-ICT companies and blockchain start-ups.

Blockchain start-ups need to create new business opportunities; they have to find compatible and competent partners for co-creation and funding agencies that can help implement a minimum viable ecosystem for blockchain.

But blockchain implementation should address myriad challenges, such as scalability of technological throughput in number of transactions, interoperability between digital and physical, etc. We need to bear in mind changes in hard and soft infrastructure needed to implement blockchain and devise a way for blockchain to equitably distribute gains.

Reimagining the future of steel in India

Indian firms can become more competitive by adopting advanced analytics through digital platforms and technologies

SAURABH BHATNAGAR

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RECENTLY, INDIA OUTPACED Japan as the world's second-largest steel producing country clocking 4.9% growth over 2017, while China retained its position as the largest producer of crude steel, clocking 6.6% growth and accounting for more than 51% of the global production, according to data released by the World Steel Association. The latest report highlights that China's crude steel output jumped to 928.3 million tonnes (MT) in 2018 from 870.9 MT in 2017, while India's crude steel production was at 106.5 MT in 2018 from 101.5 MT in 2017.

The measure of India's ranking is based on the actual output of steel produced in the country. What is not evident in this fact is that the conversion costs of India's output are still highly non-competitive when compared to some of the large Japanese and Chinese players in steel making. India has achieved a capacity utilization rate of 77.2% in crude steel production in 2018 in comparison to the current global capacity utilisation ratio of 80.4%, according to OECD data.

There are several factors contributing to this situation such as the relatively smaller size and scale of modularised manufacturing assets of Indian firms and a lack of availability of high grade yet low-cost utilities and raw materials in India. The inherent lower levels of advanced automation of some key manufacturing processes of Indian plants and the slow rate of adoption of advanced analytics and digital to drive improvements in yield, energy consumption and quality are some of the other factors.

Needless to say, the continuous improvement programmes at some of the Indian firms have made them increasingly competitive, but the rate of improvement has been slow while some of the Chinese and Japanese firms have been quick to mesh the manufacturing supply chains with highly adaptive and complex advanced analytics solutions driven through digital technologies.

Digital transformation represents a substantial opportunity for the mining and metals sector. Across value migration and value addition to industry, and value shifts to customers, society and the environment, Accenture and World Economic Forum's estimates of cumulative economic value for the period 2016 to 2025 range from \$428 billion to \$784 billion. Digital technologies have tremendous potential to move beyond stagnant growth and deliver exceptional shareholder, customer and environmental value to the steel industry in the face of disruption.

Seizing the data opportunity

Think of steel plants and what comes to mind are massive structures, heavy machinery, heat, fumes, sound and, of course, piles of steel. However, steel plants also generate voluminous data throughout the value chain—from raw material procurement, inventory and regulations to safety measures and more. While they have analytics integrated into the systems, most steel plants fail to leverage the full potential of the Goliath-like power that advanced analytics offers.

To crunch large data sets and derive meaningful insights, most steel plants in India apply conventional methods using legacy system architecture, a traditional mindset and a deep-rooted improvement culture. These traditional methods have limitations, but they could be overcome by using advanced analytics to take a quantum leap toward more efficient business operations, mitigating data-related risks and gaining a competitive edge.

To embark on a digital transformation journey, the first step is to collaborate with all the stakeholders to define the business requirements. It is important to instill an advanced analytics culture within the plants to solve industrial problems using the following action points:

■ **Gaining momentum through capability building:** Help the workforce develop core analytical skills through a continuous, comprehensive and integrated learning journey.

■ **Defining standards through an analytics center of excellence (CoE):** Build a comprehensive CoE to help the workforce gain a thorough understanding of advanced analytics.

■ **Programming a change in mindset:** Provide a supporting infrastructure that would mobilize the plant employees to become exemplars of analytics. For example, a cross-functional team across the IT, digital, research and development, and process manufacturing departments can enable a seamless flow of information and capabilities to deliver value through various on-the-job training programmes.

■ **Building a steely foundation through a digital architecture:** Formulate a set of customised guiding design principles to factor in the three Vs of big data—volume, velocity and variety.

In summary, while India's move to the second position in terms of steel production news is great, there is more to be achieved before reaching the number one position. There is a bigger opportunity for Indian firms to become more competitive cost-efficient steel makers in the global steel making market by adopting advanced analytics through digital platforms and technologies. With improved efficiencies, cost effectiveness and better management of resources and infrastructure through analytics, steel companies will not only gain competitive advantage but also progress significantly on the path to building an analytics-ready workforce.