Opinion

FRIDAY, MAY 17, 2019

FIRING UP NUCLEAR POWER

Vice-president Venkaiah Naidu

Considering the steep demand for power in the country, role of nuclear energy in future would be quite significant and we need to develop new and more efficient technologies to utilise our resources to the maximum

Indian R&D is pumping iron

Gap with today's R&D leaders could close if India maintains pace in tech-R&D, especially emerging tech

ON MANY ASPECTS of the R&D ecosystem, India still lags global giants like the US, a handful of European nations and China. But, the indications of a new energy within India and gathering enthusiasm from MNCs in investing in India for work on innovation are strong, and India will likely bridge a significant part of the gap with the R&D giants of today in the coming years. Between 2015 and 2018, a Nasscom analysis reveals, India-domiciled countries filed 4,610 patent applications in the US, and in 2017/2018, technology-related applications (chiefly in computer technology, communications technology and emerging tech like AI, machine-learning, etc) significantly outnumbered non-tech ones (mostly chemicals, pharma and mechanical inventions). Tech-related filings, buoyed by emerging technology, now make for nearly 65% of the patent-mix, up from 51% in 2015. Within tech patent-applications, emerging tech such as AI, internet of things, cloud computing and cybersecurity have steadily increased their share from 38.3% in 2015 to 56.3% in 2017/18. Of 2,536 tech filings in the period, 51.7% are from Indian companies, 24.6% are from international companies, 7.7% from indian start-ups, and 16% from others (academics, universities, academic and research institutions and individuals). Patents have been granted for 42% of the filings, while in 55% cases, the application is alive but pending grant. The intellectual property being created will apply to a breadth of industry segments—from software applications to healthcare, from telecom to e-commerce—but it is, again, the emerging areas of application (e-commerce, navigation, digital payments, etc) that are driving growth. India, thus, is fast emerging as a hotbed of intellectual-property (IP) creation, with a focus on emerging technologies.

This boost can be traced to the fact that, powered by a maturing start-up ecosystem and the leaps in digital technology development, India is becoming a preferred destination for MNCs to set up global capacity centres (GCCs). This is an evolution in itself—from being tech back-offices propped by lower costs and plentiful talent, India is now being seen as an innovation hub. From a mere delivery centre, India is now a value-centre. As per a study by Zinnov Consulting and Nasscom, over 1,250 MNCs now employ a million-plus Indians for R&D work at their India-based GCCs compared to ~1,000 employing 745,000 in FY15. The market size, commensurately, has surged by 45%, from \$19.4 billion in 2015 to \$28.3 billion in 2018. A watertight testament of this is the fact that India is emerging as the preferred GCC destination for MNCs based in the Asia-Pacific region—just Japan and Singapore account for more than 64% of the installed Asia-Pacific based GCCs in India. This vote of confidence in India's talent and policy environment for R&D—that too from hi-tech innovation-leaders, in sharp contrast with India's reputation as the Samarqand of *jugaad* innovation—is for India's reinvigorated R&D competence. Another positive that is emerging from India becoming a MNC R&D dark horse is how this is democratising in terms of geopgraphy. While Bengaluru remains the clear favourite—with Hyderabad, NCR, Pune and Mumbai trailing—for various factors including cost advantages, MNCs are looking towards the shinier Tier 2 cities to set up their GCCs in. So, a Chandigarh, a Vadodara, an Ahmedabad and a Coimbatore are in in the reckoning now. No doubt, there will be significant gains for STEM education infrastructure and local employment in not only these cities but also in their respective states. Having gotten so far, India must make policy choices carefully—on, say, education reform, IP protection, infrastructure creation—to add to the momentum.

To curb crime in politics...

...parties must act, no quantum of govt action will suffice

THERE IS CLEARLY a trend of increasing criminality in politics—even if the usual caveats about politically motivated charges apply, there is no denying that this is portentous for India's democracy in the long run. Association for Democratic Reform's (ADR's) analysis of candidates' self-sworn affidavits in the ongoing general polls show that, in 2019, 19% of the candidates analysed face criminal charges, against 17% in 2014 and 15% in 2009. What's worse, this trend also holds for candidates facing serious criminal charges that include crimes against women, assault, murder, etc—this election, 13% of the candidates face such charges, against 11% in 2014 and 8% in 2009. From the left to the right, political parties have not shied away from fielding more candidates facing criminal charges than before—40% of the ruling BJP's candidates face criminal cases (33% in 2014 and 27% in 2009), the Congress clocks 39% (28% in 2014 and 27% in 2009), while 58% of the candidates of the CPM, which has in fray only a fraction of the absolute number of candidates fielded by the BJP and Congress, face criminal charges. In the outgoing Lok Sabha, 30% of the members faced criminal charges, with 14% facing serious ones.

These figures no longer shock—what does is, despite so-called systemic overhauls, criminalisation of politics hasn't been curbed meaningfully. While the Representation of the People Act bars criminally-convicted lawmakers from contesting elections for a certain number of years, the Supreme Court, in *Lily Thomas vs Union of India* (2013), brought in immediate disqualification upon conviction, fixing the appeals loophole in debarring criminal MPs/MLAs. Even then, with trials dragging on for years, the SC, in 2014, had to order that trials against lawmakers be completed within a year of charges being framed. The government set up 12 special courts in 2017 to fast-track such trials. This, again, wasn't of much avail—of 3,884 cases against lawmakers, guilty judgments were pronounced in 38 and 560 saw acquittals, the Centre had informed the SC on September 11 last year. The Election Commission of India has now made it mandatory for candidates with criminal cases to advertise these details in popular newspapers and TV channels. But, there are ways to take the bite out of the ECI's directive—like advertising on TV at a time-slot when viewership is low or using the smallest ad space possible or mentioning only IPC/CrPC sections. Unless political parties fix selection of candidates—Milan Vaishnav, in *When Crime Pays,* shows that a candidate with criminal charges stood nearly three times greater a chance of winning than a clean candidate—muscle power will continue to trump clean, responsive politics.

The ADR analysis also highlights a rising tendency of parties to field rich candidates—in fact, resource rich states like many from the North East, Goa, Uttarakhand, Rajasthan, Odisha, Jharkhand fielded a higher proportion of rich candidates vis-a-vis developed, but less recource-rich states like Punjab, Tamil Nadu, Kerala and Gujarat. While this needs to be studied further, a correlation between natural resource availability, political power and money power can't be ignored.

TongueTIED

English-speaking correlated to caste, class & education; public schools must shore up English teaching to bridge gaps

A SURVEY BY THE Lok Foundation and Oxford University on English speakers in India finds correlations between proficiency and caste, class, and education. The survey highlights that Indians who speak in English better are likely to have higher levels of education, largely belong to the upper castes and be from an economically sound background. Just 6% of respondents could speak English against the 10% reported by Census 2011. The survey highlights that 12% of the respondents from urban areas could speak English as compared with 3% from rural areas. Not only that, 41% of the respondents who were economically better off could speak the language while just 2% of the respondents who are poor could speak it. With regards to education, proficiency increases with educational attainment—sharply so after Class X. Also, upper caste individuals are 3X more likely to speak English than SC/STs.

In a country where a large chunk of the population lives in rural areas and is poor, lack of English skills is thus a serious handicap in higher educational attainment and employment prospects. M Azam, A Chin and N Prakash, in a 2013 article in *Economic Development and Cultural Change*, a University of Chicago Press journal, point out that, in India, controlling for age, social group, schooling, geography and proxies for abilities, men who speak fluent English earn a 34% higher hourly wage than men who speak no English while men who speak a little English earn 13% higher. Reaching better English speaking levels will need concerted action on improving pedagogy in government schools, where children show lower English comprehension levels than their private school peers. Indeed, a 2012 study by EdCIL, a PSU, and NCERT, found that more than 54% of the teachers in primary schools—where teachers are expected to teach all subjects and are not appointed to teach specifically English—in eight sample states/UTs didn't report using English often during the English class. This basic lacunae in public education is only a symptom of the larger ills.

DEMOGRAPHIC DISTRESS

ALTHOUGH INDIA'S POPULATION SKEW WILL NOT HAPPEN AT THE PACE AT WHICH IT DID IN CHINA, IT MUST MOVE BEYOND POPULATION CONTROL POLICIES AND TOWARDS BRISK WEALTH-BUILDING

Will India get older before it gets richer?

TV MOHANDAS PAI & YASH BAID

Pai is Chairman, Aarin Capital Partners and Baid is head of research, 3one4 Capital

DATA FROM THE 4th National Family Health Survey (NFHS-4) 2015-16 for the survey period 2013-15 has signaled a monumental shift in modern Indian demographics. For the first time in its history, India has reached a TFR (Total Fertility Rate) of 2.18, which is below the average world replacement rate of 2.3.

For developed countries where the mortality rates of children are low due to higher health standards, the replacement rate is set at 2.1 as per the UN. As the NFHS-4 was conducted back in 2013-15, we followed the trendline of the TFR to determine that India's TFR will have fallen to about 2.0 by March 2019, well past the developed country replacement rate. This is shocking and surprising and must be validated in the coming years by NFHS-5, which is being conducted currently.

Known for its large population, India is perceived as a country which will benefit from a large demographic dividend. As population growth moves past its peak, we need to be acutely aware that the population of our youth is on the decline. Population growth is past its peak. There are not enough young people coming into India to replace the current population. As can be seen in the population pyramid chart, from NFHS 4, there are fewer babies being born over the last 10 years. The population pyramid has inverted for the first time ever. This rate of decline is only expected to accelerate in the coming years. This does not mean that the country's population has peaked as yet, because improving healthcare beckons improved longevity, which is ushering in a growing population of citizens over the age of 60.

The percentage of children under the age of 15 declined from 35% in NFHS-3 (2003-05) to 29% in NFHS-4 (2013-15). In contrast, the population of those aged 60 years and older increased slightly, from 9% in NFHS-3 to 10% in NFHS-4. India is now on the verge of becoming an older country, where we can expect the country's average age to increase over the next few decades.

An important question to be raised here is will India become older before becoming richer? This demographic movement is a monumental event that will significantly shape national policies in the coming decades, necessitating the government to take some difficult decisions.

Will there be enough wealth created by the country's working-class population for the growing segment of longer-living senior citizens that will increasingly rely on pensions? China was able to do this to an extent due to their spectacular economic boom over the last couple of decades. Although India's population skew will not happen at the pace at which it did in China, India too will need to move beyond policies for population control and towards building wealth at a brisk pace. Here are a few noteworthy measures the government will need to prioritise:

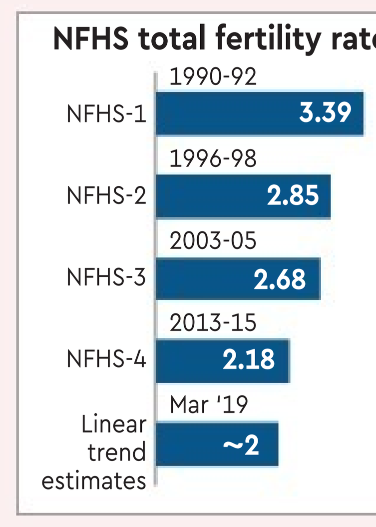
Increasing women's participation in the workforce: To bolster the capacity of wealth creation of India's working class, India must tap into the underutilised working-age women population. According to a 2018 World Bank report, the labour force participation rate among females in India was 27% in 2018 while the world average stood at 48.5%. According to IMF research, raising women's participation in the labour force to the same level as men can boost India's GDP by 27% and contribute additively to India's GDP growth every year.

Improving social security: Incentivising investments in retirement schemes like pensions is paramount for India, given its changing demographic profile. Of every 10 Indian workers, eight are informally employed, with limited access to retirement savings accounts. Further, a growing middle-class is witnessing increasing wage rates and an improving quality of life, which will result in increased expectations for retirement income. These dynamics are resulting in what the WEF predicts is the highest growth (10% CAGR) in the retirement savings gap amongst all large-population countries, as India's social security shortfall burgeons from \$3 trillion in 2015 to \$85 trillion in 2050.

Reimagining education for tomorrow: Today's job market is vastly different from what it was a decade back. Further, 65% of children joining primary school today will eventually work in a job that does not yet exist. To meet this skills-gap, the education curriculum and delivery across a student's lifecycle requires a significant revamp. There is also an urgent need to reskill a large chunk of population that is stuck in legacy roles. The government must work towards reskilling workforces in industries where job requirements are expected to alter drastically because of the shift in India's demographics.

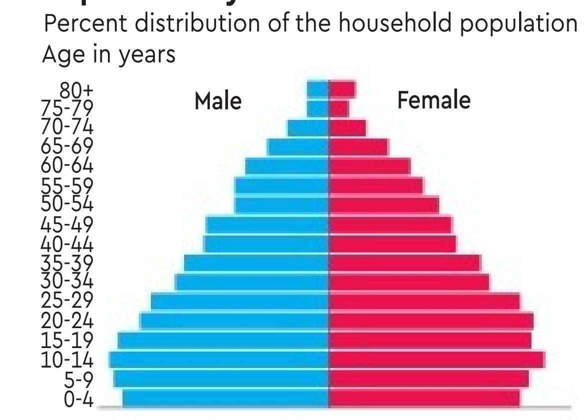
Implementing tech-enabled healthcare: The use of technology in healthcare coverage will be necessitated with a growing older-aged population in India. With a doctor-to population-density of 1/1,700, the country's dearth of quality medical talent is not a predicament that it can soon overcome. Technology can be revolutionary in delivering quality healthcare services in India by improving access, increasing efficiency of diagnosis and care, and further, reducing the cost of healthcare delivery and insurance.

NFHS total fertility rate



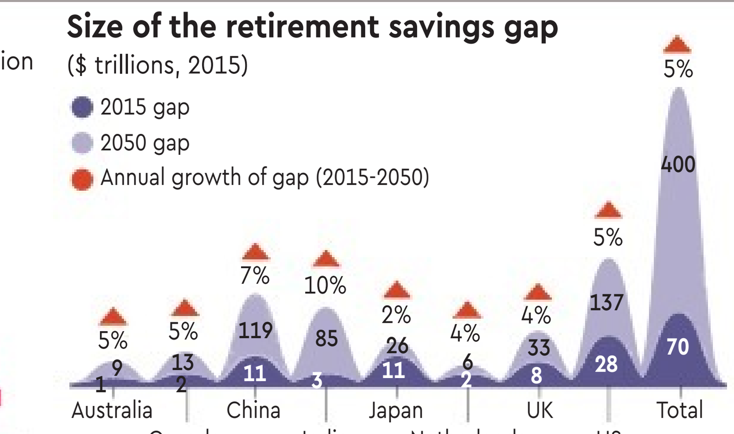
Population Pyramid

Percent distribution of the household population



Size of the retirement savings gap

($ trillions, 2015)



Source: Mercer analysis

Getting rich by investing in art is so easy

Just figure out what sells for peanuts today and will command a fortune in thirty years or so

BARRY RITHOLTZ

Bloomberg

YOU, TOO, CAN make a fortune in the art market. All you need is an eye for important, beautiful works, some spare cash and a time machine. If you lack the ability to go back a decade or more to buy what we now know will bring huge prices, well, then, making great returns in art is very, very hard.

We were reminded of this courtesy of the sale earlier this week of one of Claude Monet's haystacks paintings, *Meules* (1890). The painting was auctioned at Sotheby's in New York for \$110.7 million, a record sum for a work by an impressionist. According to the Financial Times, the price, including auctioneer fees, was 44 times more than the \$2.5 million the painting fetched when last sold at auction in 1986. This works out to an annual rate of return of 12.2% over 33 years. Then yesterday, the estate of SI Newhouse Jr., the former Condé Nast chairman, auctioned at Christies in New York Jeff Koons's stainless steel *Rabbit*. At \$91 million, it set a record for a living artist. According to *Architectural Digest*, Newhouse bought the sculpture in 1992 for \$1 million. At 91 times more than the sculpture cost 27 years ago, this works out to an annual rate of return of 18.2%. Before you look at these gains and assume that investing in art seems like a sure thing, some cautionary words are in order. The problem with this is that investors tend to notice the big winners, while ignoring the works of art (or other assets) that fail to appreciate in value. Statistically, the vast majority of investments have returns that are nothing like this; some even lose value.

This tendency to give too much weight to the big winners while excluding the losers—otherwise known as survivorship bias—has a long and storied history in investing. Mutual funds were the first great example of this: Funds tend to regularly close down and disappear due to poor performance. The Vanguard Group and Dimensional Funds Advisors each separately found that about half of funds close within 15 years. When the losers get killed off, it makes the average performance of the survivors look that much better.

How much better? Vanguard noted that 62% of surviving large-capitalisation value funds outperformed their specific benchmark. But taking account of the funds that shut lowers the rate to just 46% after five years and the disparity gets bigger the further out you go. Larry Swedroe of the BAM alliance points to an earlier study by Lipper: In 1986, it reviewed 568 stock funds, with an average annual return of 13.4%. By 1996, those returns had improved to 14.7%. During that 10-year period, almost a quarter of the funds disappeared. These tended to be the worst performing funds, and once they exited the database, the survivors registered a cumulative 1.3 percentage point improvement—essentially accounting for all of the increase in returns.

The art equivalent of this are all of the works buried in attics and basements and, most impressively, in storage at museums. Take two big museums in New York: The Metropolitan Museum of Art's modern and contemporary art collection alone contains more than 12,000 works. Not far away, the Museum of Modern Art has almost 200,000 modern works. Most of these wouldn't fetch nine figures at auction.

It is human nature to look at big winners after-the-fact, while failing to include the impact of the losers. It is not what we see that matters so much as what we do not see.

Other collectible luxury items similarly attract attention from time to time. Fine wine has been popular, as have collectible cars. Recall the end of 2018, which was a disappointing year for US equities, and an even worse one for overseas stocks. The Wall Street Journal reported that luxury goods such as wine, art, classic cars and exotic colored diamonds did better than stocks and bonds in 2018. Well, not exactly. It's only after we adjust for all of those items that weren't counted in the investment-returns analysis that we can make a sound judgment about performance.

This is the problem with drawing any conclusions from these sorts of one-off events or sales of greatly appreciated novelty assets. Mutual funds are assets designed to appreciate and be held cheaply, but the same cannot be said for these other collectibles. Everything from art to antique Ferraris to fine wine to jewelry requires storage and insurance—costs that can add up.

Author and investment adviser William J Bernstein points out that much of the appreciation in art and other collectibles is really just a lesson in the magic of compounding. One painting by one of the Old Masters bought from the artist for the equivalent of \$100 and sold 350 years later for hundreds of millions of dollars returned just 3.3 percent annually, he calculated. "If you save and you have even a modest rate of return over hundreds of years, then you'll have a fabulous amount of money" he said on our *Masters in Business* podcast.

Selecting appreciated investments after the fact is easy. Instead, consider this challenge: What work of art are you willing to buy and hold for sale in 2052? That question reveals just how difficult investing in collectible assets really is.

LETTERS TO THE EDITOR

BJP should drop Pragya Singh Thakur

Pragya Singh Thakur, the terror accused in Malegaon blast case and the BJP nominee for the Bhopal Lok Sabha seat, emphatically said that Mahatma Gandhi's killer Nathuram Godse is a patriot and would remain a patriot for ever! By praising the assassin of Gandhi, Pragya justified the murder of the Father of the nation and deserves to be punished for her high-handed utterance, even though she later apologised for the same. The BJP which has nominated the terror accused to contest the Bhopal seat as if there was no other worthy person in the party to be fielded, should bow its head in shame over the encomium paid by their 'saint' nominee to a cold-blooded murderer. If the saffron party is truly nationally-minded as it boasts of being, it should instruct Pragya to withdraw her nomination from the election as she has also lost all moral right to enter Parliament. Will the BJP, immersed as it is in the RSS indoctrination, come forward?

— Shalini Gerald, Chennai

BJP, TMC shame India

It is unfortunate that the bust of 19th century educationist and social reformer Ishwar Chandra Bandopadhyay, known by the honorific Vidyasagar, was vandalised on Tuesday. Looking at the media reports, both the parties, the TMC and the BJP, seem equally responsible for letting their workers run riot. Neither party has apologised. What to talk of apology, when Kolkata was burning, our PM was counting seats stating that the BJP will cross 300-mark on its own. Further, with its credibility coming under a cloud repeatedly, the ECI didn't declare end of campaigning on Wednesday, what with the PM's rallies at Dumdum and Mathurapur(WB) on Thursday.

— Satish Khosla, Chandigarh

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Views are personal

JET AIRWAYS

A flight plan gone wrong

Jet, which billed itself as India's oldest private airline and dominated Indian skies for two decades, turned out to be a disastrous, hollow organisation, taking things day-by-day on dwindling resources and frantically looking for an investor who would pump in money. There is much in the national narrative about getting Jet flying again. The dismaying truth is that this is simply not possible

JUST LAST YEAR, Jet Airways celebrated its 25th anniversary. It pulled out all the stops in the celebration, heralding the milestone with a swish commemorative logo, and revelled in the fulsome praise lavished on it from all quarters. Notable among all the compliments it basked in — besides the praise for its fleet, crew and service quality — was the hardiness with which it had survived, for decades, a variety of external body blows. Steep hikes in aviation fuel prices, global currency fluctuations, industry challenges and fierce competition, both global and domestic — it had survived all these. Naresh Goyal took a long, deep bow.

It certainly seemed obvious that Jet Airways, like other airlines, had made the most of the vaunted Indian aviation boom. An April 2018 report shows that the sector experienced 42 months of double-digit revenue per kilometre (RPK) growth and the load factor on all airlines were in the 90 per cent range. All the parameters showed a robust and growing aviation environment. All other Indian airlines also reflected growth and income consonant with these numbers.

All this came swiftly crashing to the ground in the beginning of 2019, with a growing degree of aircraft grounded due to non-payment of lease rentals, and then, the death knell: "Suspension of operations", which is virtually a terminal closure. The airline that billed itself as India's oldest private airline, and had dominated the Indian skies for two decades, turned out to be a disastrous, hollow organisation, taking things day by day on rapidly dwindling resources and frantically looking for an investor who would pump in money. Total closure was imminent and more than 22,000 Jet employees found their paychecks had vanished. Scores of people employed by the many support services met with the same fate. Lessors pulled back their aircraft, leaving Jet Airways with a sad fleet of one Boeing 737 and five ATRs in the end. Rival airlines are now quickly picking up the experienced Jet pilots and engineers, and the peerless cabin crew that were the pride of the airline, reportedly at much lower salaries.

The flood of financial irregularities coming to light was particularly shocking: Jet Airways was in debt in excess of Rs 8,500 crore to Indian banks, the largest exposure was of the State Bank of India. The other Indian banks include the Punjab National Bank, Yes Bank, IDBI, Canara Bank, ICICI Bank, Indian Overseas Bank and Syndicate Bank. Who had approved these loans down the years? Why had more and more good money been thrown after the bad debt for years? Had any promoter guarantees been taken? Why hadn't forensic financial audits been conducted? If it was conducted, what are the findings? What actions had been taken by the banks after raids by the Income Tax department on Jet offices last year, which had apparently discovered gross financial management? Above all, what was the full extent of the loss? What about the airline's statutory dues like provident fund, ESIC, TDS, service tax, GST, etc? What does Jet owe to the Airports Authority of India, Indian Oil and other fuel companies, which are also government bodies?

This is not just a chilling replay of the Kingfisher Airlines debacle, because it is much larger in magnitude. Vijay Mallya had fled to London and was ensconced in some kind of financial immunity, though, here in India, Mallya's houses, cars, and assets were confiscated. But what was being done to stem this horrific haemorrhaging of public money and is any attempt being made to stop Goyal from leaving India? Was there any plan to impound his array of assets? Did anyone realise that Goyal and the Jet Airways debacle was much larger than Vijay Mallya and Kingfisher Airlines?

Even more chilling in this case was, once again, the fact that the largest component of the financial exposure was to government-owned banks and organisations. Obviously, this was a massive mismanagement of money, not possible without the aid of individuals who had misused their power. Banks, for all purposes, must now supply explanations for a slew of inexplicable decisions made over the years. Crores were disbursed to the airline, but against what collateral? Then there is the bizarre SBI defiance in not declaring the airline an NPA, and insisting it is not an NPA as late as March 25. If Jet is wound up, will the banks really recover any money?

There is so much pontification now about selling the airline. But what is left for a buyer? An airline's main assets are its aircraft, flying rights, slots, parking rights and its personnel. Parking rights and slots in Mumbai and Delhi, and in cities abroad are priceless assets. These have now been taken up by Indigo, SpiceJet, Vistara, GoAir and Air Asia in India, and they are not fools to give them up easily.

I may claim a rather unique perspective to an understanding of the Jet Airways situation. I started Damania Airways in 1993, the same year Jet Airways began. But when I saw the writing on the aviation wall a little over two years later, I made an extremely painful decision: I handed the airline, intact, to new investors. At that point, the complications in Indian aviation were so suffocating because of government regulations, no airline could survive without contorting itself into untenable positions.

Many trusted Jet Airways to practice and maintain superior management so that their personal lives are not affected. The agonising plight of Jet Airways staff now could have been avoided. In fact, just recently a finance company froze the savings of Jet staff from their forex debit cards to recover the airline's outstanding. This scramble to recover monies at the expense of innocents is taking things to a new depth of cruelty.

> The circus surrounding the deceased airline resembles the bizarre sight of a phalanx of medical personnel pretending to resuscitate a deceased patient ... at the graveyard

There is much in the national narrative about getting the airline flying again. The dismaying truth is that this is simply not possible. The airline has been abandoned into the hands of people who just want their money back — banks and lenders.

Jet Airways unfortunately is not coming back. It simply cannot. What is worse, Mallya and Goyal have brought global shame to the Indian aviation industry by making Kingfisher and Jet Airways the laughing stock of the international aviation sector. The damage done will now take years to undo.

Indeed the circus surrounding the deceased airline is now resembling the bizarre sight of a phalanx of medical personnel pretending to resuscitate a deceased patient at the graveyard. All the key management of the airline has resigned. The fleet has gone. The slots and parking bays have been handed over to competitors. The employees have been abandoned. And, the powers that be, including the SBI, are still brazenly prattling on about finding a buyer. The latest supposedly interested party operates out of an industrial gala in Chakala, Andheri, called East Darwin Platform holdings. There is another, a former air passenger service agent, and some other small bidders. These are the kind of unsolicited bidders the banks are reaching out to now.

Jet Airways has, very unfortunately, crashed, Ladies and Gentlemen.

Is the NBFC crisis imminent?

KUSHANKUR DEY

The author teaches finance at IIM Bodh Gaya. Views are personal

Should commercial banks take over ailing but systemically important NBFCs?

RBI AND SEBI HAVE to tighten regulatory supervision as NBFCs are going to face an impending crisis. That is attributed to liquidity crunch in the NBFC sector and can potentially retard the pace of financial intermediation and induce systematic risk in the financial system. MCA states that overleveraging, squeezed credit flow, asset-liability mismatch and misadventures by a few large entities are some causes serving a recipe for this disaster. Can we make a systematic attempt to understand the crisis?

RBI's FSR (June 2018) mentions that NBFC sector aggregate balance sheet size stood at ₹22.1 trillion. But there is a stark decline in share capital growth of NBFCs in 2017-18—a negative growth rate of 58% between 2017-18 and 2016-17, while borrowings grew at 19.1%. It implies that the capital structure mix of NBFCs is likely to be overleveraged. Loans and advances of the sector have increased by 21.2% with investments growing by 13.4%. Net income showed a positive growth of 30.8% in 2017-18. Return on Assets and Return on Equity were 1.9% and 8.4% in 2017-18, respectively.

From asset quality and capital adequacy viewpoint, GNPAs of the NBFC sector as a percentage of total advances had gone down from 6.1% in 2016-17 to 5.8% in 2017-18. NBFCs' capital adequacy ratio (CRAR) notched up from 22% in 2016-17 to 22.9% in 2017-18, but decreased from 27.5% in 2013-14. NBFC sector had about 15% combined exposure to capital market and real estate in 2017-18.

So, we can infer NBFCs have leveraged their capital structure with more debt and lesser equities. It is understood from FSR 2018 that NBFCs are the largest net borrowers of funds from the financial system with gross payables (current liabilities) of ₹7,170 billion and gross receivables (current assets) of ₹419 billion in March 2018. So, the current ratio (current assets/current liabilities), being a yardstick of liquidity, is as low as 0.058 (much below finance industry benchmark).

A breakup of gross payables indicates that NBFCs received 44% of funds from scheduled commercial banks followed by 33% from AMC-MFs, and 19% from insurance companies. Long-term debt funds followed by long-term loans and CPs were major sources of fund raising for NBFCs in 2017-18.

> NBFCs have been plagued with liquidity, maturity problems, but they have reportedly a high capital adequacy ratio

NBFCs are facing a maturity problem between their rate-sensitive assets and liabilities arising from assets (long-term loans) and liabilities (short-term borrowings) mismatch. This, coupled with liquidity, poses a threat to their solvency that can show a declining net worth.

RBI had conducted stress tests on the credit risk for NBFC sector and individual NBFCs for 2017-18 and found that under a pessimistic scenario (sudden increase in GNPAs at 99% level of confidence), NBFCs' capital adequacy ratio/CRAR will decline to 20.4% which is still above the prescribed level of 15% for tier-I & II capital. For individual NBFCs, around 10% of companies would not be able to comply with the minimum regulatory norms under the said pessimistic scenario.

Can the crisis be averted? NBFCs have been plagued with liquidity and maturity problems, but they have reportedly a high capital adequacy ratio. So, based on the two indicators, one can only conjecture the likelihood of a crisis. For confirming this phenomenon, we have to look into the *FSR (issue 18)* likely to be released in a month's time. Meanwhile, RBI and SEBI must take measures similar to PCA devised for banks in FY17.

NBFCs cannot depend on AMC-MFs or commercial banks for fund raising as the rollover risk has increased and asset-liability mismatch has widened. So, internal financing from reserves and surpluses can be a way out but for a few. Injection of fresh equities from the capital market may not be possible as the market sentiment has been muted post the debacle of a few large players in housing and real estate. Long-term bond market is not mature enough to meet the sector requirement. Bailing out a large number of NBFCs is not a solution due to moral hazard and principal-agent dichotomy. Should commercial banks come forward and take over ailing but systemically important NBFCs? We have no straight answer. Principle-based financial reporting for 2018-19 would give a clear picture where NBFCs stand. A few may survive and many could fall—asset-light NBFCs can withstand the test of time as compared to asset-heavy ones.

WORLD TELECOM DAY

Standards for ethical, trustworthy design

The role of tech standards, their global versus local nature, and the need for interdisciplinary approach

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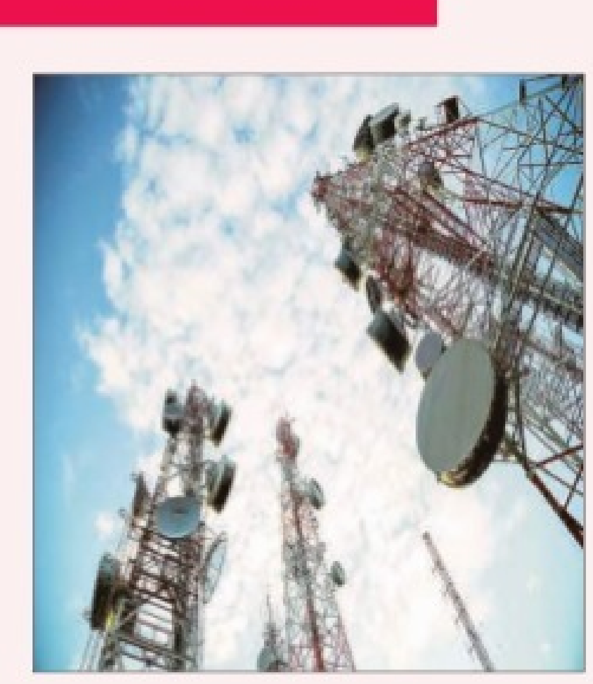
THE ANNIVERSARY OF the signing of the first International Telegraph Convention and the creation of the International Telecommunication Union (ITU) is celebrated on May 17 as the World Telecommunication and Information Society Day. The theme this year is 'Bridging the Standardization Gap'. The Secretary General of the ITU, Houlin Zhao, has indicated in his message that the upcoming 5G standards, augmented by AI and autonomous systems, will support a new range of applications from self-driving cars to safer and smarter cities.

Standards promote interoperability, and act as a platform for large-scale adoption of technologies. Standard bodies such as the ITU, Institute of Electrical and Electronics Engineers (IEEE), 3rd Generation Partnership Project (3GPP), American National Standards Institute (ANSI) and International Organization for Standardization (ISO) have been promoting standards for the development and adoption of technologies worldwide. Although some countries and companies developed country-specific standards—such as the Time Division-Synchronous Code Division Multiple Access (TD-SCDMA) by China and Betamax (video tape recording standard) developed by Sony—most failed to attract adoption. Oz Shy, the noted economist, in his book '*The Economics of Network Industries*' illustrates how countries and firms benefit by mutually recognising standards compared to recognising their own standards in their product offering.

Most technology standards developed so far are, in general, country- or region-agnostic—such as the IEEE 802.11 standard for Wi-Fi or the Long Term Evolution (LTE) by 3GPP. However, as autonomous systems powered by AI and big data are being deployed across sectors, countries have started developing local standards and guidelines for privacy protection, preserving human rights and expressions, traceability, and accountability for legal protection, amongst others. One of the reasons for this emerging paradigm is that attributes such as privacy, data protection, sovereignty of nations, and human autonomy can have different connotations and interpretations across demographics, gender, race, religion, and geographical regions. Hence, it is a challenge for global firms to produce products and services that meet the varying standards.



To cite one initiative that has garnered worldwide support is the Unicode Standard for consistent encoding, representation, handling of text expressed in most of the world's writing systems. The standard is maintained by the Unicode Consortium, and as on March 2019 the most recent version—Unicode 12.0—contains a repertoire of 137,993 characters covering 150 modern and historic scripts, as well as multiple symbol sets and emojis. Organisations such as the ICANN have adopted Unicode as a replacement of ANSI.

Notable work has been started by the IEEE Global Initiative on Ethics of Autonomous and Intelligent Systems along with organisations such as the Japanese Society for Artificial Intelligence, the Dalai Lama Center for Ethics and Transformative Values at MIT, and the Systems, Man, and Cybernetics Society in the development of standards on Ethically Aligned Design (EAD)—the first version of which has been released in March 2019. Building on eight core principles such as human rights, well-being, transparency and accountability, the EAD is likely to inspire IEEE P7000 series of standards in the future for AI and autonomous systems. As machines powered by AI increasingly mediate our cultural, societal, economic and even political interactions, the EAD augurs well. A couple of examples from the EAD deserve attention. Our societies have not yet established standards or guidelines as to how human norms and values should be incorporated into intelligent and autonomous systems. The values vary across cultures, regions and races. However, when the autonomous systems increasingly take over human oversight and autonomy in many aspects of our lives, then they need to incorporate and learn the norms and values of the societies with which they interact. The systems and algorithms must act responsibly without any bias or discrimination; embedding clear traceability of the causes of failure, if any; and be responsible and accountable. The recent enactment of algorithmic accountability requirements (in the US) require standards for verification and validation of algorithms that are embedded in autonomous systems.

As technologies such as mobile broadband, robotic voice assistant, face recognition and biometric sensors embrace individuals and societies, an interdisciplinary approach to ethical and trustworthy autonomous systems is the need of the hour. In a research paper that appeared in the '*Nature*', a collection of 23 authors from as many countries and institutions pointed out that the study of AI systems and machine behaviour requires cross-disciplinary efforts including computer scientists, social scientists, economists, psychologists and lawyers. Research institutes and government funding agencies can play a very important role in the design and development of large-scale neutral and interdisciplinary studies in AI, which can explore, apart from the technical aspects, the principles from other sciences to build guidelines and standards for autonomous systems.

China has taken the lead, with close to $15 billion investment in AI research. In India, the NITI Aayog has drafted a strategy for AI, proposing creation of a National AI Marketplace (NAIM). Hopefully, these initiatives should promote the development of standardised autonomous products and systems that behave responsibly and even with a bit of emotion!