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Free LPG or more LPG?

The answer to that will determine whether PM will go in for more populism or more reforms

SUNIL JAIN

Though the 500-point rally in the Sensex after the BJP's sweep in Uttar Pradesh means the stock markets expect the freshly-empowered government to unleash a new set of reforms, another set of analysts are worried about a fresh bout of populism from a prime minister who is, of late, talking more of helping the poor—even demonetisation was packaged as a pro-poor measure—than he is of economic growth.

Indeed, after the UP victory, sections of the ruling party talked of how the central government's ability to provide free LPG connections to 50 lakh rural poor, to electrify more villages (1,464 in last two years vs 26 in 2010-14 under BSP and SP) and provide a 20% hike in power supplies in the state is what convinced voters of how they would get a better deal under a BJP dispensation in the state.

The metric of free LPG, of course, best symbolises the choice before prime minister Narendra Modi. No one doubts the success of his #GiveItUp programme and the dramatic impact on women's health when LPG replaces firewood for cooking, but at ₹2,000 crore for the year, the government's budget to provide free LPG across the country is vastly constrained. While encouraging private sector players is clearly the answer to providing LPG connections to everyone in rural areas—just see how limited India's phone penetration was when MTNL/BSNL were the only players—no private players will come in as long as the government gives free LPG as it does right now under the Ujjwala scheme.

This tussle between reform and populism is Modi's challenge. The fact the government is talking of merging ONGC with HPCL while it should be selling off an HPCL or a BPCL to create genuine competition in the market suggests reforms on the backburner—right now, with no land available in cities, private competitors like Reliance and Essar can only set up petrol pumps on highways.

Whether the new BJP government in Uttar Pradesh waives off farm loans to small and marginal farmers, as it promised during the elections, will be another test of populism-vs-reforms. At ₹86,000 crore, the exposure of PSU banks to agriculture in UP—a fourth of all loans are to the farm sector—is very large. Apart from the fact that the state exchequer can't possibly bear the burden of waiving off even a fraction of this—the share given to small/marginal farmers—this will set off copycat demands in other states and encourage farmers to stop repaying loans and wait for a change in government every five years.

> **Govt can't provide LPG-for-all in rural areas—just as BSNL couldn't with phones—so need pvt players, but govt's free LPG makes it unviable for them. That's Modi's choice: Reform vs Populism**

What makes the populism-vs-reforms tradeoff all the more stark is that while it is clear Modi needs to increase investment levels in the economy for growth to pick up, this cannot happen till the bad loan problems of banks are fixed—any large-scale farm-loan waiver will only worsen the situation for banks.

While the government has tried to boost government—including PSUs—capex, this cannot possibly do the trick. While government capex rose from 7.1% of GDP in FY14 to 7.4% in FY16, this wasn't enough to stop overall capex falling from 31.2% to 29.2%—FY17 capex is estimated to fall further to 26.9% though a public-private sector split is not available.

The growth-vs-dole tradeoff, of course, was most stark during the 2014 elections which Modi swept. At that point, the UPA's Food Security Act promised 5 kg of vastly subsidised grain to two-thirds of the population—that worked out to ₹375-500 per family per month. If people still voted for Modi, it was because, if growth and jobs picked up, this was the kind of money families could earn in just one to two days.

While the government's efforts have, so far, largely been fixed on repairing the plumbing—plugging leakages in social sector expenditure, spending more on irrigation and crop insurance, for instance—it will require more to really kick off fresh investments. Rahul Gandhi's jibe of *suit-boot-ki-sarkaar*, for instance, is probably the reason for why the government has not taken too many pro-corporate initiatives. For two years, it refused to free prices of natural gas, and this resulted in an investment famine in the oil/gas sector. In telecom, its inability to correct artificially boosted spectrum prices has ensured the sector is down on its knees.

And the bad bank, so critical to clean up the balance sheets of banks and corporates has languished so far for the same reason of being construed as pro-business – with the bulk of investment during the go-go years of the late 2000s coming from firms that are highly leveraged today, this is the biggest block to investment growth.

Even in the farm sector, so critical for jobs creation, the government has been unable to really free the sector and its continued reliance on government-led procurement to stimulate growth has backfired. In Uttar Pradesh, farmer-dues on sugarcane have already reached ₹6,200 crore due to faulty state-advised-prices (SAP) that keep the price of sugarcane artificially high—the dues are ₹2,500 crore, though, when calculated on the basis of the central government's fair-and-remunerative-price (FRP). During the election campaign, Modi mocked Akhilesh Yadav for the huge dues but if the BJP government is to continue the same SAP policies, the sugar industry/farmers will take another hit. In many ways, the BJP's actions in Lucknow will indicate whether populism or reforms will be the new mantra in New Delhi.

EYEING SPACE

The radar tech Nasa used to locate Chandrayaan-I can be used to make space travel safer

FINDING Chandrayaan-I, which was "lost" since August 2009, in its orbit around the moon is the newest feather in Nasa's cap. But it is the technique that enabled the find that is truly revolutionary. Scientists used ground-based radar technology, i.e., sending microwave beams and listening to echoes, to track the lost device orbiting the moon. Not only could they find the spacecraft, they could also determine its speed and orbit. Nasa has already been using this technology to communicate with Voyager-I spacecraft, which has reached the edge of the solar system, but it was never, until now, used to discover a non-functional orbiter. In fact, the only other time this was used to discover Nasa's lunar reconnaissance orbiter, but even then, the spacecraft was operational.

With companies and countries sending more space missions and satellites into orbits, the technique can help in providing interplanetary radar investigations to ensure that objects don't collide in space. Though limited to moon so far, it can perhaps be used in the case of other planets, ensuring there is no overcrowding of space. Moreover, with ground radars having the ability to track lunar orbits, space travel can certainly become a lot safer. As many companies like Tesla, Amazon, etc, eye space travel as a business pursuit in the future, they too could use ground radar to reassure their passengers.

BJP's UP sweep is made of this

Modi's charisma, Shah's organisational genius, local party structure, overarching vision, aspirational voters

What an election it has been! More than 310 seats for the BJP in Uttar Pradesh. Did anyone even dream of this scenario? These once-in-a-generation results in the just concluded assembly elections for five states, and more specifically UP, have established what can be described as a new normal in Indian politics. That new normal is this: The BJP under the historic leadership of prime minister Narendra Modi and the organisational master-class of Amit Shah has established itself as the preeminent political party of India—the party that caters to the aspirations of every section of Indians.

While each state election is of equal importance, the results in UP have a special significance, if for no other reason than the sheer legislative numbers the state brings to the national polity—80 seats in Lok Sabha, 31 seats in the Rajya Sabha and an important say in determining the presidential elections. But, what is it that the BJP did in UP that has coloured the state so completely saffron? After all, remember that even at the peak of the Ram Mandir movement, the state did not vote this decisively and with this consistency for the BJP. Is there something about the BJP's UP model that can act as a template?

Essentially, the BJP's UP model can be described as the *Panchva Tatva Model*—a perfect pentagon where each arm worked in harmony with the others and delivered a model worthy of emulation.

The first *tatva* of this arm is the most obvious—the charisma of Narendra Modi. How else can one describe the phenomenon where just months before an election result, a leader says that unlike others, I will not take a populist decision but I will demonetise 86% of India's currency which will inconvenience you, and yet the people vote for him like they have never voted before for anyone? UP has also established, in some senses emphatically, what people most like about Modi—his decisiveness when it comes to national interest. Be it driving his team extra hard, round-the-clock, to delivering almost 2 crore LPG connections in less than a year, to delivering a body blow to the cancer of black money in India or in establishing a new benchmark, through the surgical strikes, in how India will respond to terror attacks—Modi has shown he is decisive when it comes to Indian interests.

The response that Modi drew in Varanasi, where he campaigned for three straight days, only reinforced this aspect—that for Modi there is never a backseat and he is not a general who will leave his troops to battle while himself hiding in the safety of the barracks. Modi, instead, is a general who leads from the front.

The second *tatva* is the organisational genius of Amit Shah and his ability to identify talent. He established this in 2014 when he was in charge of the state. In 2017, as national president of BJP, he has shown that not only has he cemented his past success model but also that he learns from every experience. Within the span of less than three years since 2014, more than 12 lakh new members were added to the BJP, thereby increasing its social base across the state. But Shah's lasting contribution to the BJP's election machinery must be establishing the importance of booth management. Before Shah was sent to UP in 2013,

ANIL BALUNI

> **One specific element of BJP model has perhaps been its most potent—it established a "class" of BJP voters when all others were vying for caste voters or voters on the basis of religion**

booth committees as the driving force of micro management was a concept still to take hold in the UP BJP.

By the 2014 elections, under him, the BJP had booth committees in 37% of the critical booths. This number increased to 87% by 2017. In addition, the entire state was divided into 82 district units, 1,463 *mandals* and 9,933 sectors. Having already established the concept of *Panna Pramukhs* at booth level, this time Shah introduced another innovation—booth *rakshaks*. Their job—to act as protectors of the booth in every aspect. From ensuring that planned campaigning happens at their booths to reporting feedback to senior leadership, the booth *rakshaks* owned the booths with heart and mind.

The third *tatva* of the BJP's machinery is the local organisational structure. This meant on the one hand that out of the 403 constituencies, there was not even a single constituency which was not touched by at least two major star campaigners and on the other ensuring that the entire state party leadership worked as one. The first was achieved by the brilliantly crafted Parivartan Yatras. The *yatra* touched every nook and corner of the state, helped mobilise the cadre, and establish mass contact right at the grass roots level. And how did the BJP achieve the second—ironically, by not declaring a CM candidate. In this respect, UP has actually demolished the construct that one cannot win a big state without a pre-declared face. Indeed, the BJP has established that in a state where there are many claimants for the top position, all of whom have come up the ranks by a democratic process and not through dynastic succession, not declaring a face helps. It worked in Maharashtra, and Haryana earlier, and now has worked so demonstrably in UP as well.

The fourth *tatva* is complementing this ground work by an overarching vision. The manifesto the BJP released was not only comprehensive and forward-looking, but as with all things BJP, under this new leadership, it was designed and presented in an attractive manner as well. It was no longer a dreary document that had to be released just to complete the paperwork. Instead, top brains of the party, in Lucknow and in Delhi, went into first drafting it and then designing and presenting it. And as has been the new norm in the BJP, inputs were also invited from the people of UP, and more than 30 lakh inputs were received.

The fifth and last *tatva* of the BJP model has perhaps been its most potent and with the most long-term appeal—it has established a "class" of BJP voters when all others were vying for caste voters or voters on the basis of religion. The BJP's appeal was simple—if you are looking for a better future for yourself and your children, then as a class, vote for us, irrespective of the caste, sub-region or religion you belong to. The local leadership line of the party established this class model as well—from Rajnath Singh to Kalraj Mishra to Keshav Prasad Maurya to Yogi Adityanath. Between them, they represented the widest swathe of the state's population.

If 2014 started the era of Modi, then after this round of election results, it can be stated without a doubt that the era has not only just begun but that it has a long and glorious future, not just for the BJP but for the country as well.

The author is spokesperson, BJP

All hands on deck for GST

There is still a window to remove the flaws that make the GST regime an imperfect one

The last GST Council meeting (the eleventh since the Council's inception), though scheduled for two days, got concluded in a day as the revised CGST and IGST Laws were approved by the Council. The proceedings turned out to be very productive and many a decision regarding composition scheme for small hotels and restaurants, raising the cap of GST rate to 40% (CGST+SGST), etc, were taken at the meeting. In the next meeting, scheduled for March 16, the SGST Law and the Union Territories GST (UTGST) Law would be discussed and agreed upon. While the four Central laws, namely CGST, IGST, UTGST and GST Compensation Bill would be approved by the Union Cabinet before they are presented in Parliament, respective state assemblies have to pass their SGST Laws with simple majority. This might pose a big challenge for the July 1, 2017, deadline as all the states need to pass the SGST Law in their respective assemblies as also notify the rules and forms well before the implementation date. As it is seen now, it might be a photo finish!

In all the melee, the crucial discussion on GST rates is yet to happen. Also, the changes to the CGST and IGST Laws as agreed upon by the Council have not been shared with industry, clearly to save time on one more round of representations. In fact, it would be prudent to share these changes now as the suggestions, if any are to be made to the CGST Laws, need to be reflected in the SGST Laws as well in toto. If the changes suggested by industry to the CGST law are reflected in the draft SGST laws before they get presented in the respective state assemblies, uniformity in both the Laws can be maintained easily. Else, it would be a long drawn logistical process to carry out the amendments in each and every SGST Law after it is passed by the state legislatures. This might delay the roll out of the GST.

Industry is waiting with bated breath for the draft GST rates to be announced. This is because of a variety of reasons. Most of the businesses in India firm up their budgets for the next financial year well before the beginning of the new financial year. These budgets include the procurement budgets, sales budgets, capital expenditure budgets, etc, among other budgets. Industry is currently guess-estimating the GST components on various products and services in the absence of any formal communication from the government. On top, an anti-profiteering clause has been added in the Model GST Law which would compel taxpayers to pass on the benefits arising out of lowering of GST rate or increase in input tax credits to customers. Now, it is apparent that all the service providers would be getting incremental input tax credit of the SGST paid on inputs and cap-

RAHUL RENAVIKAR

> **The rate structure needs to be announced soon as companies will need to make corresponding adjustments to their business models and budgets**

ital goods used for providing services, which hitherto was not allowed as they were not subjected to state VAT. Similarly, all traders in goods who were ineligible to take credit of CENVAT paid on input services in the current service tax regime would be able to claim input tax credit of GST paid on input services in the GST regime.

These and many such examples can be cited where there would be substantial savings in the input costs. However, businesses have spent time and money in getting ready for the switch over to the GST. Many have been working on the transition for couple of years. Further, training of staff, changing IT systems, increased compliance costs, etc, are the key incremental expenses incurred/to be incurred by businesses in embracing GST. Can these expenses be off-set against the savings accruing due to GST rates and GST credits? What is the proportion of the savings that needs to be passed on to various class of customers? Before introducing such a clause, all the facets need to be deliberated and discussed. It is estimated that not less than 6 million taxpayers would be registered under GST. One can imagine the magnitude of this clause and the mechanism that would be required to track compliance of the same.

That India would be implementing an imperfect GST, wherein crucial sectors like oil & gas, electricity, have been left out of the GST net and they have to continue with the perils of the complex indirect structure that we currently have, is a foregone conclusion. The GST dream and the promise made more than a decade ago on bringing in a flawless GST has withered away over the years, owing to various concessions and deliberations to bring every-one on board. However, there is still a window to correct many flaws and this can make the GST less imperfect. It is up to the rejuvenated government to reconsider its earlier decisions and make quick amends. Especially, the decisions which were insisted upon by the states can be relooked now that the majority of the states have become like-minded. Surely India deserves a much better version of the GST when the wait has been of more than a decade?

The achievements of the Council in such a short time are certainly laudable. In order to get the ball rolling faster on GST, all stakeholders now need to switch to the top gear and ensure that they get things done without any further delay. Now that the dust of the poll results in five states has settled, all hands now need to be on the deck for implementing GST on July 1, 2017!

The author is managing director, Acuris Advisors Pvt. Ltd. Views are personal

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INFRATWEETS
VINAYAK CHATTERJEE

Lightning speed

- As per REC data 12,145 villages electrified out of promised 18,452 in 1000 days (i.e. by May 1st 2018.) Promise within grasp. Good luck !!

Spreading light to the remotest villages
The Rural Electrification Corporation data shows that these villages—located in 19 states—have been electrified in 510 days. Of the 5,559 villages that are still dark, a majority are in north-eastern states like Arunachal Pradesh (1,229) and Assam (945), as also eastern states like Odisha (848), Jharkhand (858), Bihar (570) and Chhattisgarh (464).

- April 16 to Jan 17 data ~ Renewables contributed 5.7% of India's energy prodn. But renewables growth is 26% vis a vis 5% of conventional.

- Calculations by RN Nayak (ex CMD PGCL) ~ 4 million res rooftop installations needed to achieve solar targets. Mass movement necessary.

Rising renewables
Renewables is the driving force of energy production in India. However, the total solar installation till date stands at 9,000MW, with rooftop panels accounting for 1,020MW. The target set by the government is about 1,500MW in FY17. The balance 38,500MW needs to be installed over the next 5-6 years.

- Regional air connectivity set to takeoff. Along with UDAN scheme, Cabinet clears ₹4500 cr package to rejuvenate 50 unserved airports.

50 unserved airports to be revived
The Cabinet Committee on Economic Affairs (CCEA) has cleared the project which aims to revive 50 unserved and underserved airports. Fifteen airports/airstrips each would be revived during 2017-18 and 2018-19, while 20 would be taken up during 2019-20.

- Parliament told 20 of 44 hydro-electric power projects (>25 MW) under implementation are stalled ~ aggregating to 6329 MW. That's large!

Stressed hydro projects a cause for concern
According to power minister Piyush Goyal, a staggering amount of ₹30,147 crore has already been spent on these stressed 20 hydro projects. He also added that the government has sanctioned the proposal regarding basin-wise reassessment of hydro potential in the country.

- India's untapped Municipal Bond market: USA raises $300 billion 'Munis' per yr. Cum raise in India = ₹1750 crs till date. SmartCities?

Bonds of urban development
The importance of raising funds through municipal bonds cannot be overemphasised. The richest municipal body of India, the Brihanmumbai Municipal Corporation, earned 33% of its revenue in 2015-16 from octroi, which will go away once the goods & services tax (GST) is introduced.

- Hyd Metro mngmnt expects entire 72 km project to be ready by June 2018. No mean feat considering huge challenges faced on various fronts.

Light at the end of the metro tunnel
An 11-km stretch of the Hyderabad Metro project is expected to be completed by mid-2017, and another 18-km stretch by the end of this year. This, despite many challenges, including right of way issues and mass litigation.

- Congratulations to Delhi Airport for being ranked 2nd Best in world by Airports Council Intl in the 40million+ passengers/annum category.

Delhi airport's mega achievement
In a significant achievement, the Delhi International Airport Limited's (DIAL's) Airport Service Quality (ASQ) score increased from 4.96 in 2015 to 4.99 in 2016, taking it to the second-best airport globally, only after Incheon in South Korea.

- Green order: SuprCourt has said that industries that do not have effluent treatment plants will not be allowed to run. Implementability?

Supreme Court slams polluting industries
The Supreme Court has directed all industrial units to have their primary effluent treatment plants up and running in three months. Failure to comply would result in disconnection of power.

—Vinayak Chatterjee is Chairman of Feedback Infra
His Twitter handle: @Infra_VinayakCh
A weekly selection of the author's tweets—
with a brief backgrounder—in the infra space, by Adite Banerjie

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Are Chinese women still holding up half the sky?

As 'top down' mandate flails and social attitudes remain entrenched, the market takes its toll on the quarter century of hard-won rights of Chinese women
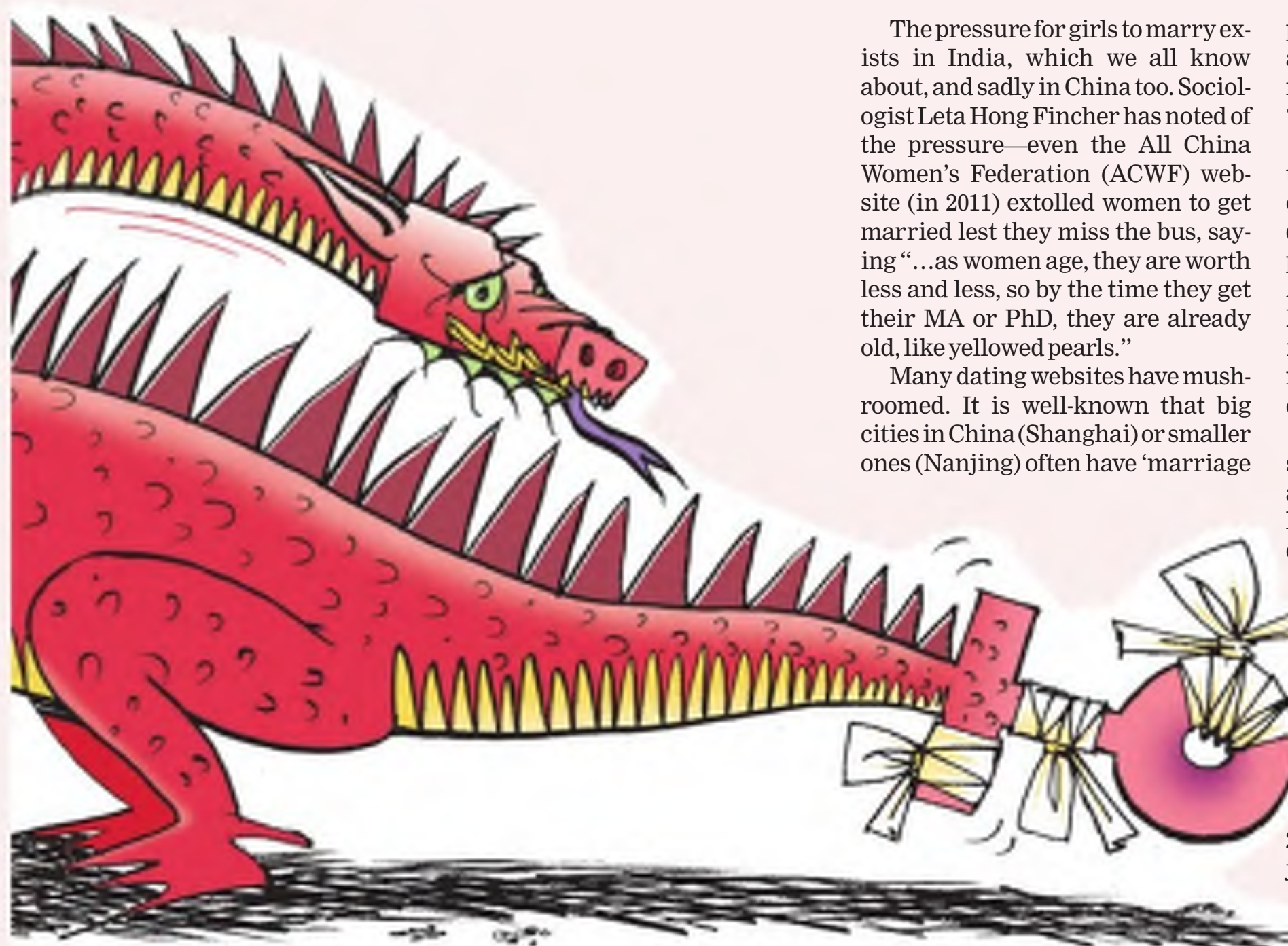
ROHNIT PHORE

ANURAG VISWANATH

SEVERAL shocking cases out of China in the recent past—from rape to domestic violence to social stigma attached to single women called the '*sheng nu*' or leftover women—may be few and far between, but indicative of the massive social upheaval in China where a few decades ago this would have been unthinkable. China has long been applauded as where women 'hold up half the sky'. Is that slogan now a blur of a cry from the past? Clearly, what is falling flat is, as China-hand Jude Howell noted, "the gendered effects of an increasingly globalised and marketised economy and society."

Cases such as that of a pregnant 10-year-old Chinese girl by a 20-year-old man who met her online, a 12-year-old pregnant girl who had been trafficked into China from Vietnam and sold to a 35-year-old man, a 15-year-old Chinese girl with two children born of rape, raped by a 74-year-old man (*Sixth Tone*, 2016) and, of course, the documentary 'Hooligan Sparrow' (2016), which chronicled an activist's effort to get justice for six schoolgirls raped by their principal in 2013 in Hainan, have taken the country by storm.

These would shock China's revolutionary forefathers who enshrined gender equality in the Constitution (1954), forced women out of the kitchens and highlighted the productive role of women in the state—at some cost: single dress code and assuaging women that they were the same as men.

Socialist China had its paradoxes, but violence against women was nothing short of an aberration and abomination of the lowest kind. The mandate for gender equality came 'top down' and filtered right down to the bottom via revolutionary models such as the 'Iron Girls' who could play basketball, fix wires, work at a factory and yet naturally take stock of domestic tasks. That dissipated in market times, where the desexualised, androgynous woman went out of the window and in came the fashionable, westernised woman who could still naturally be the 'virtuous wife and good mother'.

In 2016, taking note of the expected reproductive and domestic role of women in China, came SK-II's advertisement (cosmetic brand), which highlighted the predicament of single women in China (over 27 years of age), the so-called leftover women—who, like their Indian sisters, bear the cross of being singled out as marginalised rejects. The advert was an intimate look at a cross-section of women who were single for various reasons, who wanted to live life on their own terms without making compromises, yet disparaged as losers who had failed to get married. Shockingly, a Chinese official writing for a government-backed newspaper in China called Taiwanese President Tsai Ing-wen 'extreme' because she was single, as he generously explained. Perhaps this comment was born more out of the current animosity between China and Taiwan, and he was playing loyalist to the hilt.

> In post-socialist China, with socialism and forced gender parity a thing of the past, out in the open are cases of rape, molestation, domestic violence and the social stigma of "left-over" women

they were the same as men.

markets', which in recent years have turned into a curious spectacle of sorts for tourists. In Shanghai's People's Park, ageing parents congregate to put up posters/pictures of their children on parasols or on the notice board. A laminated sheet with a photograph describes hobbies, income and age. 'Leftover' women are often delicately coerced by their families to look for a groom at such informal marriage markets.

There has been a spurt in domestic violence. In 2011, the high-profile multimillionaire Li Yang (the founder of Crazy English, a school that imparts English education) was found guilty of hitting/injuring his American wife Kim Lee (who posted her pictures with the bruises online).

The case made legal history as it highlighted domestic violence. The court ruled in favour of the victim (2015) and led to the enactment of a national law against domestic violence (which came into effect in 2016). But just days before the law came into effect, the 24-year-old Li Hongxia was strangled by her husband (whom she had earlier accused of domestic violence)—yet another tragedy.

In post-socialist China, such cases have come to the fore, reflecting either of the two realities—that these are nothing new, but were unreported, or that this is a new reality in new times and climes. Either way, it does not reflect well on a rising China.

It is hard to quantify the increase/decrease of rape and violence in China because of the thin data. Beyond the increased reporting, there are a number of cases which are sim-

The pressure for girls to marry exists in India, which we all know about, and sadly in China too. Sociologist Leta Hong Fincher has noted of the pressure—even the All China Women's Federation (ACWF) website (in 2011) extolled women to get married lest they miss the bus, saying "…as women age, they are worth less and less, so by the time they get their MA or PhD, they are already old, like yellowed pears."

Many dating websites have mushroomed. It is well-known that big cities in China (Shanghai) or smaller ones (Nanjing) often have 'marriage

ply swept under the carpet because of a huge social stigma—China is notorious as a 'culture of silence' or as a 'culture of face-savers'.

Ironically, China's social indicators are praiseworthy. Female literacy is high in the country, at 94% (UNESCO 2015), and labour participation rate is among the highest in Asia (63.9% in 2013, ILO in China). Naturally, women in China are choosing to marry later than before (the mean average was 25 years in 2015, compared to 23 years in 2011).

But China's social indicators obscure the changing ground realities of a marketised society where female labour participation is declining, gender-ratio continues to be skewed and a gender gap in employment exists. Beyond the market, China's traditional preference for boys continues to drive a skewed gender ratio of 117.7 boys to 100 girls in 2012, and 113.5 boys to 100 girls in 2015. This is even worse than in India (110 boys to 100 girls, 2012; 107.6 boys to 100 girls in 2015). Women in China in blue-collar jobs retire earlier than men, at 50 years of age, and women in managerial occupations retire at the age of 55 years. Men retire at 60.

As much China has made strides in various fields, one glaring lacunae has been the marginalisation of women in political life, despite millions of female members in the Communist Party. According to the Information Office of the State Council (2005), China boasts of 13 million female Communist Party members (18% of Communist Party, a small increase of 3 percentage points over 1995. In 2013, as many as 20 million, or 24%, were party members.

Political scientist Zheng Yongnian, Zhao Litao *et al* (2009), using a comprehensive index of women's participation in party, government, legislature (from 1995-2004), noted that women's participation has been shrinking. They concluded that though affirmative policy exists, it is a "general guideline" for women representation, "while no other quantitative index exists to measure female participation in various Party and government committees, including standing committees."

The top echelon of the party, the Politburo Standing Committee, is marked by the absence of women. Two women, Liu Yandong (vice-premier) and Sun Chunlan (head of the United Front Work Department), are members of the 25-member Politburo. Will a woman make history by becoming a member of the Standing Committee at the 19th Party Congress slated later this year? That remains to be seen.

The moral of the story is simple and universal—as 'top down' mandate flails and social attitudes remain entrenched, the market takes its toll on the quarter century of hard-won rights of Chinese women. This point cannot be wished away.

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BIT BY BIT

Driving driverless

The quest for an autonomous car has now reached a driverless truck

NANDAGOPAL RAJAN

AT San Francisco's Pier 90, chock-a-block with cargo vehicles, it is pretty tough for any truck to stand out. But a white Volvo truck with Otto emblazoned on it is the centre of attention. This is the next big thing in automated cars and has already shown its mettle by delivering a consignment of Budweiser beer in Colorado, without a driver controlling it on the freeway.

Uber is one of the many companies thinking in terms of driverless car. While CEO Travis Kalanick says automated vehicles are "existential" for the ride-hail-

ing company's future, he is not alone in the race to drive without drivers. Just in the US, at least 23 companies—including Tesla, Google and Volkswagen—have registered in autonomous vehicle programmes. The idea that fuels this cutting-edge technology is pure economics, at the end of the day. Cars suffer from serious issues of inefficiency as they sit idle 95% of the time. Considering that the world has 1,200,000,000 cars, this is inefficiency at a gargantuan scale. Add to this the fact that cars account for 22% of all emissions globally, and muddy the urban infrastructure problem by creating the need for parking spaces.

Since 1984, when the first experimental self-driving cars appeared, there has been much progress on the technology, leading to Mercedes-Benz showcasing its concept car, the F 015, at the Consumer Electronics Show in Las Vegas in 2015. Everyone has a different take on

the technology, but in the end the idea is to make cars intelligent and independent enough to be aware of surroundings and take decisions based on that.

Interestingly, Uber's dream is to bring "reliable transportation to everyone, everywhere," now extended to everything too, with the trucks from Otto, a start-up it acquired last year. Matt Sweeney, who heads product at Uber's Advanced Technology Group, says "the truck and passenger vehicles share software and hardware components and this helps us work on different aspects of the self-driving problem at the same time." But on scope, passenger vehicles are for urban environments where Uber has its focus on ride-sharing, while trucks will be for high-speed highways where the constraints are different.

Just last week, Uber got a permit from California Department of Motor Vehicles to test two self-driving Volvo SUVs on public roads, though it will need to have backup drivers behind the wheel in case the prototype cars malfunction. Its self-driving cars have been running test drives in other parts of the US, too.

The Otto truck comes with a rig of radars, laser scanners and stereo cameras that give the computers inside a live, 360-degree vision of its environment, with high dynamic range, high resolution and high colour information imagery, so that

the truck can be smart enough to decide what to do next. But the computing task this presents is "almost as big as a small datacentre." Sweeney says the computing has to be done inside as "there is no tech that can let us send all that data to the cloud real time, and hence a lot of the computing has to be done in the truck itself."

"A lot of the tech is based on prior mapping, but in subsequent runs we see differences that have come about in the area and pay attention on those objects that are different."

Interestingly, Otto is being sued by

Google's Waymo self-driving car unit, which claims its former employee and start-up founder Anthony Levandowski stole its proprietary design for its laser-based radar system. There are other challenges too. "Uber tech is different because we are trying to make this on top of the ride-sharing network that we already have," he added.

Nissan, in contrast, keeps the driver and not the technology at the centre, and its definition of an "autonomous car" is hence a vehicle with different levels of driving technologies that enable it to op-

erate autonomously for certain periods of time. A Nissan spokesperson said on the technology side the challenges are in artificial intelligence software development, data processing and digital mapping technologies, while on the social environment side laws and regulations along with modifications of road infrastructure will become necessary.

This contrast in technologies is why it is important to see how the entire ecosystem evolves, maybe with different platforms talking to each other. But Uber is not depending on this. "We need to see and interact with vehicles, but there is no guarantee we will have that technology. So we are approaching it with the assumption it won't exist," says Sweeney.

Uber's goal is to take its technology everywhere, but can these vehicles actually be practical for an environment like India. Sweeney accepts the new elements this will throw in, along with the sheer volume, will present a slew of challenges. "Those are situations we think we will be able to tackle, but those are not the first places we will go," he explains, adding that they will look for opportunities where they can deploy this technology safely. Clearly, this drive has just started.

(The author attended the Uber Media Summit in San Francisco at the invitation of Uber)
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