

Opinion

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KEY TO MIDEAST PEACE

Mike Pompeo, US secretary of state

You can't achieve peace and stability in the Middle East without confronting Iran. It's just not possible



● COMPREHENSIVE REFORMS

THE CHALLENGE IS TO INCREASE BOTH THE SCALE AND IMPACT OF FINANCIAL RESOURCES, IMPROVE LINKAGES, AND BUILD PARTNERSHIPS BETWEEN THE PUBLIC AND PRIVATE SECTORS

Only structural transformation can cure rural distress

A YOUNG POPULATION, entrepreneurial spirit, and stable macroeconomic outlook have made India one of the fastest growing economies in the world. This has lifted millions out of poverty, but India is still home to the largest concentration of poor people in the world. Most of them live in the rural areas with poor access to education, health, roads and electricity. Is increased rural distress a reflection of rising inequality associated with the fast pace of growth, or a concern on the lack of opportunities and unfairness in rural areas, where a majority of the people still live? Rural distress is both a cause and effect of India's structural transformation and fast pace of growth. There are well-understood limits to the pace at which countries can accumulate physical capital. But there are no limits to knowledge diffusions, and the pace at which urban-rural gaps can be closed.

India's fast pace of economic growth and increased rural distress is not a puzzle. Everyone can now see how others live. People in the rural areas have raised their aspirations and are now demanding a better quality of life. Although humanitarian aid is perceived by many economists as the most efficient way of dealing with rural distress, this may not be a substitute for a faster pace of rural structural transformation that India needs to accelerate growth and job creation.

Conventional wisdom suggests that industrialisation and urbanisation grow together and hand-in-hand. India's industrialisation and urbanisation did grow together in the early 1990s. But the two trends have spatially dispersed in the last decade, and the manufacturing sector is now de-urbanising (*bit.ly/2S48PYw*). The share of the manufacturing sector in employment, output, and number of enterprises in the urban areas has declined but it has increased in the rural areas. This process of spatial transformation has brought about a more efficient allocation of enterprises across urban and rural localities. But this process has been too slow, as manufacturing enterprises find it

hard and costly to locate to the rural areas due to inadequate physical and human infrastructure.

More than 40% of total employment is still employed in the agricultural sector in India, compared to less than 20% in China, and less than 2% in the US. People in rural areas depend on agriculture, not because it is remunerative, but because there are few alternative employment opportunities. There is room for improving agricultural productivity, but this is not a substitute for a faster pace of rural structural transformation that India needs to improve the quality of life. Declining importance of agriculture in development is an integral part of an inclusive growth process.

India's rural distress is partly a symptom of its twin balance sheet problem and factor market distortions. Enterprises need three factors of production—labour, capital and land—to produce output. Is labour, capital or land more misallocated in India? Land is much more distorted than capital and labour. Less efficient firms manage to grab more land than more efficient firms. Because land is used as a collateral for most bank loans, capital is also distorted. Most bank loans require some form of collateral to guarantee the loan. Land is simply the best form of collateral due to its immobility (i.e., the debtor can't run off with land). While borrowers can often pledge 80% of land values against loans, for most other forms of fixed investment, the loan-to-collateral value ratio is substantially



EJAZ GHANI

Lead economist at the World Bank

lower (for example, 25%). While there may not be such a thing as a perfectly efficient factor allocation, there are huge gains to be made from reducing land misallocation. India is one of the most land scarce countries in the world, and land is also the biggest asset in the rural areas. Reducing land misallocation will not only reduce rural distress, but also enable India to achieve double-digit growth rates.

Integrating energy efficiency is important not just for reducing rural distress, but also for improving the liveability of cities

India's rural distress also reflects rising concerns of gender inequality. Conventional wisdom suggests that a faster pace of economic growth should reduce gender discrimination. But this is not the case in India. The share of females in manufacturing employment has barely increased over the last two decades, but it has increased in agriculture, as men leave rural areas in search of better jobs in the cities. India's increased feminisation of agriculture has worsened gender equality, due to the heavy work burden in rural areas, and lack of access to basic amenities, including drinking water, sanitation, and much more. While agriculture has become increasingly feminised, the ownership of agricultural assets by women has not increased.

India's green growth has worsened in the rural areas, if we measure green growth by the amount of energy used to produce an output. It is estimated that nearly 70% of the global carbon emissions is contributed by poor energy efficiency. Indian cities have increased energy efficiency, but it has deteriorated

in the rural areas. These trends have been exacerbated by the de-urbanisation of the manufacturing sector. Although the installed capacity of India's power system is the fifth-largest system in the world, it is still insufficient to meet India's rapidly increasing rural demand. Integrating the energy efficiency agenda with the rural structural transformation agenda is important not just for reducing rural distress, but also for improving the liveability of cities.

India's future is in where one would least expect it to be. It is in the rural areas, that will continue to benefit from the demographic dividend. The infrastructure financing needs of rural structural transformation is huge. But the potential for attracting more private investment is also huge. The basic traits of rural infrastructure projects, such as market size, long-term steady revenue stream, and investment returns that exceed inflation make them attractive for most institutional investors. The funds managed by private institutional investors exceed \$100 trillion, but their allocation for rural infrastructure projects is tiny.

Maximising finance for rural structural transformation will not come from a single financing instrument. Only by combining resources—Central and state, international and domestic, public and private, corporate and philanthropic—will it be possible to achieve the necessary levels of financing. The challenge is to increase both the scale and impact of financial resources, improve linkages, and build partnerships. Both markets and administrative institutions are weak in rural areas. This calls for increased coordination, not just increased competition between public and private sector, and between urban and rural areas, as India's manufacturing sector is de-urbanising, and structural transformation is still evolving. Rural distress will not be resolved through humanitarian aid but through rural structural transformation that can benefit the demographic dividend, create more jobs and enable India to achieve double-digit growth rates.

Huge delays in procuring are the real Rafale scam

CAG report has enough to please both BJP and Congress, but the delays in procuring weaponry are unconscionable

WITH THE CAG report on the BJP government's purchase of 36 Rafale fighter aircraft giving both the BJP and the Congress enough ammunition to claim that their stand was correct, it is unlikely the storm over the purchase is going to end anytime soon. The Congress has to be happy with the CAG's observation that, by allowing Dassault to not issue a bank guarantee, this lowered its costs, but the benefit of this was not passed on to the government. The BJP, on the other hand, has to be pleased with the CAG's finding that, after taking various parameters into account, its deal was cheaper than that by the Congress party, even if it was only 2.86%. Also, since the Congress/UPA government never actually concluded its deal due to non-agreement on critical parameters like the labour costs of the aircraft that were to be manufactured by HAL and Dassault's refusal to guarantee the HAL-Rafale's quality, the BJP can convincingly argue that there was no Congress deal, and had these parameters been factored in, the BJP deal would be even better. As the CAG report puts it, "the above two issues led to a stalemate in negotiations. Five years after the bid, and after three years of evaluation and negotiations, there was no finalisation". Indeed, the CAG points to how, during the UPA period, Dassault was allowed to go ahead in the negotiations despite its aircraft failing to qualify technically and despite the fact that its bid did not mention the capital costs of producing the aircraft here.

What is even more worrying, and the Congress alleging foul play in the BJP's purchase will only make this worse, is the huge delays in buying equipment and the impact of this on the armed forces; *Economic Times* has reported that India is in talks with Russia to buy mothballed MiG-29s, after some upgradation—in all probability, this is the result of the urgent need to maintain a minimum-sized fleet. So, despite India buying ₹78,000 crore of equipment each year, there are unconscionable delays in the process; signing the first Rafale contract, done in the UPA period, took 180 months. Part of this is due to the culture of over-specifications by the armed forces instead of just giving their broad requirements—the Air Staff Qualitative Requirements for the Rafale jet deal had 660 parameters! Even something as non-complex as a Doppler Weather Radar had 42 parameters and that is why it took eight years to conclude the contract while the Indian Meteorological Department bought this in just nine months, the CAG points out. Adding to this massive over-specification which meant that no firm could ever meet all the specifications, the procurement procedures are extensively overhauled every 2-3 years. If this wasn't bad enough, when the UPA's defence minister appointed a team of outside experts to oversee the compliance of the Integrity Pact in June 2012, and these experts said it was okay, the minister decided the matter should be examined again by the ministry's officials. The team was not able to give its report in the remaining two years of the UPA(); and when it did, in March 2015, it naturally recommended that the process be scrapped since the issue of the HAL-costs and the Rafale quality-assurance had still not been agreed upon. While it is possible to argue the BJP government influenced the officials once it came to power, there is no satisfactory explanation from the Congress party on either how soon these issues would have been sorted out or how they would have impacted the price; and how was a Rafale plane to be bought, even if it was the cheapest, if the French manufacturer wasn't going to guarantee the quality of the aircraft produced here? Sadly, such issues, including the structural defects in the procurement process and the depletion of the armed forces' firepower as a result, have got brushed aside in the noise about the PMO's interference or why Dassault was allowed to get away with not giving a bank guarantee.

Ending the ratings bias

Instead of firms, a group of investors should pay for them

IT IS A fact that ratings agencies haven't exactly covered themselves with glory; their assessments have often been way too optimistic, to put it mildly. And their alerts and rating changes usually come way too late, leaving investors like sitting ducks. In some instances—like with IL&FS—the agencies seem to have had no idea whatsoever of the goings-on in the company or they simply decided to look the other way.

Some of the blame for this must lie with the regulator since there seems to be no penalty whatsoever for the poor assessments or the delayed alerts. But it is not as though the investors are completely blameless; dishonesty among fund managers is not exactly unknown. Which is why, the system needs to be revamped and it is good news that SEBI is looking to make some changes. News reports suggest SEBI wants investors to pay for the ratings, rather than the companies, which is the practice at present.

Conspiracy theories say this won't work either because bankers and fund managers typically want to embellish the quality of the rating so that they can set aside less capital against the loan exposure or report a better NAV (net asset value), as the case may be. That is not hard to believe, going by the track record of both bankers and fund managers.

One suggestion is that companies continue to pay for the ratings and that a pool of funds be created from the fees; the rating agencies would then be paid from this corpus, but the amount to be paid would be decided by an accredited panel of investors. To be sure, ratings agencies will say this is unworkable since they will have no control whatsoever over their revenues. That is a valid point because, to ensure that the quality of ratings doesn't drop, an agency must invest and, in order to do that, it must have visibility on its revenues. Also, there is no guaranteeing the investors will be altogether unbiased while allocating the fees to the ratings agencies. What this system does achieve is that it breaks the nexus between the company and the rating agency since the fees cannot be negotiated between them and, therefore, the rating outlook cannot be influenced. Perhaps investors—bankers, insurance companies, mutual funds, EPFO—should commission ratings assessments and pay for them jointly. That would ensure that no one fund manager influences the rating and, at the same time, the ratings agency would be assured of its fee. Also, since the costs would be shared, it would not burden a single investor. The companies can also contribute to this pool—a flat amount perhaps—which could also be paid out to the ratings agencies as a flat fee. It is important to free the system of biases.

LoveLost

The reported oath by school students from Surat celebrates anything but the true spirit of Valentine's day

VALENTINE'S DAY is usually celebrated with an expression of love for those who occupy an important part of one's life, and it is marked with a lot of passion and rigour. Social media is swarming with date and gift ideas for your special one(s) while, on the other hand, fringe groups and anti-Valentine's squads menacingly gaze at couples who dare to engage in even the smallest display of public affection. Now, a group of students in Surat will reportedly be taking an oath as a part of a very special ceremony. *The Indian Express* reports that about 10,000 students will be taking a vow declaring eternal loyalty to (not their lovers, but) their parents! The oath will be one that compels students to never marry without the consent of their parents. The unique event is being organised by a voluntary organisation, Hasyamev Jayate, founded by laughter therapist Kamlesh Masalawala who also heads quite a few laughter and cathartic crying clubs in Surat.

This is anything but cathartic though. Masalawala, expounding on the reasons behind this initiative, elaborates "students would come to me with problems like their parents are against them marrying the person they love. I am not against the love affair, but... explain the importance of family and of the devotion they should have for their parents. The parents will compromise and agree to their match but they would get hurt in the process". While not belittling the possible importance of the role parents can play in the nuptial decision of their children, what of the pain, grief and suffering that someone might endure if they are forced to wed anybody else but their chosen beloved? What of the importance of the role one's autonomy plays in one's life? With expressions of romantic love being controlled by and in the name of love jihad and anti-Romeo squads, the students who do end up taking the oath might have to endure the command of their parents over their romantic lives as well, more so on a day when the free, uninterrupted display of affection is commemorated.

Huawei offers case study on free trade

As the internet of things expands, what technology isn't ripe for data theft? Your phone is made in China. So why isn't it just as susceptible to data theft as the network on which it operates?

PRESIDENT DONALD TRUMP is reportedly close to issuing an executive order that would ban Chinese companies like Huawei Technologies Co. from building 5G wireless networks in the US. The significance of such an order goes beyond its obvious implications for American telecommunications companies. The prospect of closing technology-related markets to competitors from China raises a fundamental problem that is going to plague policymakers for the foreseeable future: How can they draw the line between economic protectionism and legitimate national security interests? In a world of data and data theft, will every technology-related industry become an exception to free-trade rules?

On the one hand, from the perspective of liberal trade economics, barring Huawei from US markets is classical protectionism. It is a bedrock principle of free trade that foreign competitors should be allowed into domestic markets. Competition promotes efficiency. Protectionism kills it. It is possible to argue that Chinese companies, whether partly state-owned or outright state-controlled, get illegitimate subsidies from the government, artificially lowering their costs and breaking the rules of fair trade. But the way to address those subsidies, according to free-trade law and ideology, isn't to ban foreign competition altogether. It is to use the tools of trade law to pressure the foreign country to stop the subsidies.

On the other hand, from the perspective of national security, technology infrastructure is a plausible candidate for the kind of industry from which a government should exclude competitors from adversarial countries. There is no doubt that it would be in China's national interests to swipe data from 5G networks—so named as the fifth-genera-

tion of cellular wireless technology—that its companies built in other countries. That means it is in US national security interests to keep that from happening within our borders.

To be sure, the US is probably no better than China in this regard. American companies are easy targets (or partners) for US intelligence to steal the same kinds of data. When it comes to convincing third parties such as Hungary or Poland to buy American 5G infrastructure—a key purpose of secretary of state Mike Pompeo's current visit to Europe—the argument can't be that your data is safe with American companies. No one would believe it. Instead, Pompeo is saying that the US won't want to build military bases in countries with Chinese telecommunications infrastructure in place. Nevertheless, within US borders (though not outside), federal law blocks the government from monitoring the communications of "US persons", meaning citizens and others who live in the country and are entitled to federal constitutional protections. So it isn't necessarily hypocritical to make a national security argument for excluding Chinese 5G providers within the US.

The upshot is that it is very difficult to say whether a Trump administration order blocking Chinese competition in telecommunications infrastructure would be undesirable protectionism or a desirable national security precaution. Very possibly it might be both. The contradiction matters—a lot. It lies in the verisimilitude of the post-war liberal international trade order. Historically, those who favour free trade have depended on being able to draw a clear line between protectionism (bad) and national security (good). And that line usually hasn't been so difficult to draw.

When Trump imposed tariffs on foreign steel and aluminium based on the

theory that US national security demands a strong domestic industry, it was relatively easy to say at a conceptual level that this argument was unconvincing. After all, the same argument could be made about almost any big industry. In economic terms, the tariffs are protectionist. The national security rationale is a fig leaf at best. (A court challenge is pending). Indeed, the possibility of drawing the line between protectionism and national security is built into international trade treaties, which typically prohibit protectionist tariffs while allowing exceptions for legitimate national security interests. Article XXI of the World Trade Organization treaty carves out certain actions that a signing country "considers necessary for the protection of its essential security interests".

The real worry about the 5G case is that it will set the terms for future technology-related protectionism. As the internet of things expands, what technology isn't ripe for data theft? Your phone is made in China. So why isn't it just as susceptible to data theft as the network on which it operates? What about your computer, your car, your smart thermostat, your washing machine, and so on and on?

The national security argument for protectionism in these domains won't be ridiculous, any more than it is ridiculous for telecommunications networks. This conflict isn't going away. It is just coming into focus. For proponents of free trade, 5G represents just the most obvious example of a major challenge that is going to be salient for a while. Without a good answer, they might discover that the national security rationale has the capacity to kill free trade, a little bit at a time.

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NOAH FELDMAN

Bloomberg

LETTERS TO THE EDITOR

Corrigendum

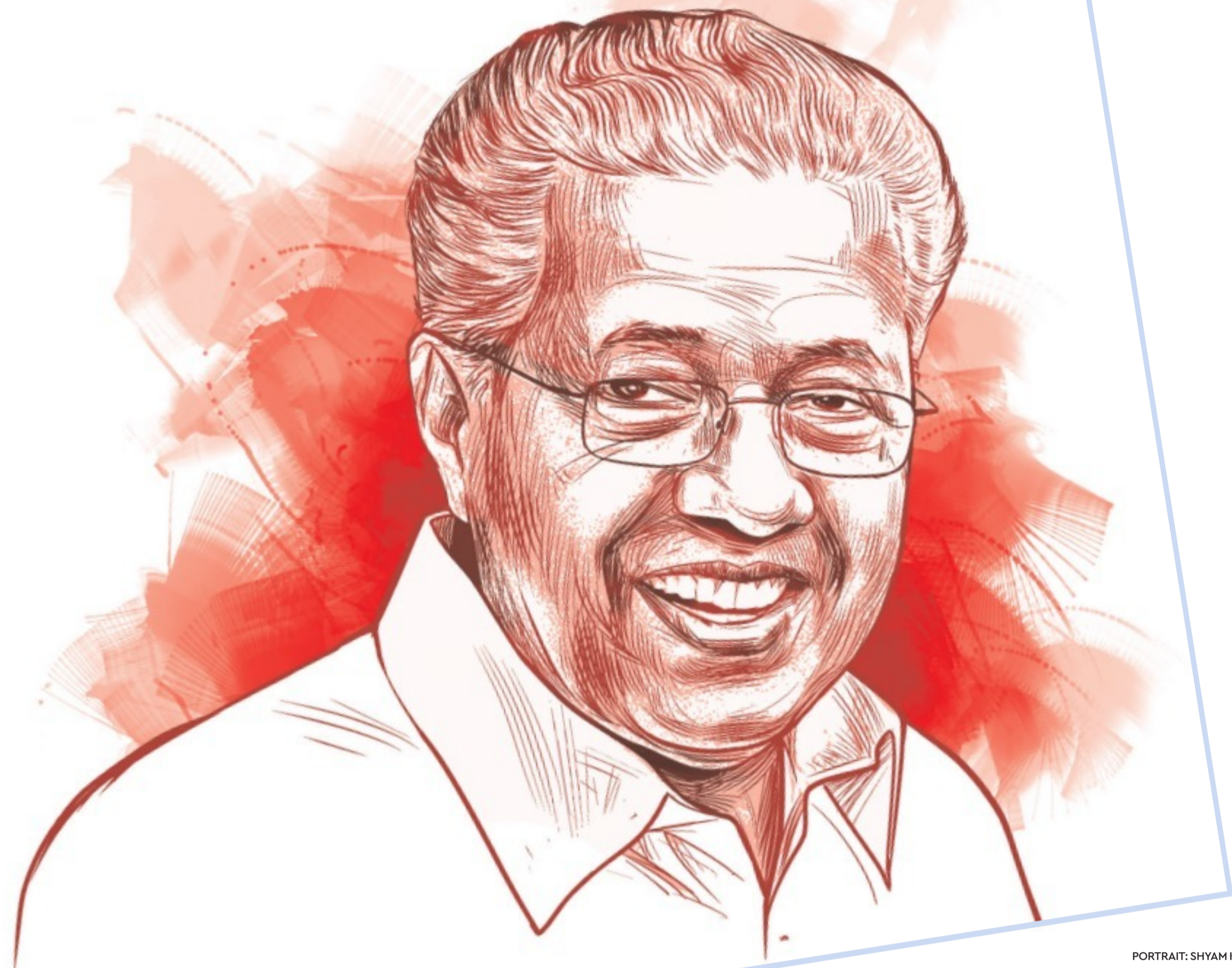
The picture of RK Singh, the minister of state for power (independent charge) was incorrectly carried in the article, *The new avatar of 'Make in India'*, published on February 14 in this paper, as that of the author RK Singh, IRS officer and retired chief commissioner of customs. The error is sincerely regretted

Effort for automation

With the advent of 5G and AI, the market for autonomous vehicles, devices and gadgets is expected to gain an uptick. Although the use of personal/commercial driverless-cars is still limited and business models counting on higher levels of automation are still in a mode of continuous improvement, advancements in robotics and knowledge-driven sensor mechanisms in the near-future can render total automation and increased safety. It is important for a developing economy to re-craft jobs, bridge the skill gap by addressing the training needs of the current workforce. Although sophisticated and low-latency systems can offer high efficiency, throughput and a smoother hand-off, a higher cost ought to be incurred towards installation, deployment and maintenance to fine-tune the new-generation digital technology and prevent potential mishaps. Improved intelligence, predictive capability, productivity and hack-proof information security is a pre-requisite to render consistent user experience, thus allowing consumers to embrace the technological advancement. Welcome initiatives are being undertaken to establish R&D centres, invest in ventures to hone the skills of new entrants/existing professionals in advanced technologies and offer higher onboarding incentives or benefits

— Girish Lalwani, Delhi

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PORTRAIT: SHYAM KUMAR PRASAD

● **RECORD CAFÉ:**
PINARAYI VIJAYAN, CHIEF MINISTER, KERALA

Centre's policies hurting Kerala, union militancy only propaganda

Kerala scores high on many parameters of social development and governance, and its per capita income is one of the highest in the country. The coastal state, however, faces the issues of very high unemployment rate and below-potential economic growth. It is still to remove the perception of not being investor-friendly, with reports of frequent hartals and trade union militancy. Chief Minister Pinarayi Vijayan spoke to FE's KG Narendranath on the side lines of the recent ASCEND 2019 held in Kochi to showcase steps undertaken by his government to promote entrepreneurship and improve ease of doing business in the state.

Hasn't this investor meet, the first by your government, come a bit late in the day?

In the past over two-and-a-half years, we have taken several legal and administrative steps to facilitate investments into the state and improve ease of doing business. These include an omnibus legislation amending seven existing Acts and a common application form for as many as 14 departments, both aimed at ensuring time-bound, hassle-free clearances, besides the proactive steps to make land available to units in industrial clusters at affordable rates. In all, over 100 reforms have been carried out, solely with investor interest in mind.

The message has gone to all stakeholders including the bureaucracy that entrepreneurs must be treated as valued partners in the state's development. There is a need to find more employment for the state's youth here itself. This conference

(ASCEND 2019) marks a culmination of a series of investor-friendly steps taken by us since assuming office.

While a few global investors may have set their eyes on the state given its abundant human capital and resources like a long coastline, domestic corporate groups aren't viewing Kerala as an investment hotspot yet...

Over the last few decades, apart from other factors, direct or tacit prodding by the Central government has influenced Indian corporate groups' decisions on project sites. These groups don't always take independent calls on where to invest. Unfortunately, Kerala never got the benefit of such government involvement in investment decisions by the private sector.

Do you mean such prodding by the Centre has had a political content?

Politics cannot be wholly separated from it. We are not getting due share of public (Centre/CPSE) investments either; even the commitments made by the Centre are not often getting fulfilled. In case of central transfers, the criteria being evolved tend to militate against us; we are sort of penalised for our relative success in many areas.

Kerala's economic growth is below

potential. GST hasn't bolstered the state's tax revenue buoyancy, and non-development expenditure remains high, leaving very little for capex. Isn't the state of the economy a cause for concern?

It is true that the state's economy and fiscal situation are not exactly in a very good shape. We are making efforts to address the situation and these are yielding results on the ground. There are signs of investments picking up in a big way. Relationships are being forged (with investors). Savings of non-resident Keralites have become a major source of investments.

Why should an investor prefer Kerala to other states?

The firms that are already here have only good things to say about the state. Their experiences are what we can use to invite others to the state. People are our greatest strength. Kerala's labour quality is the best in the country, the state's social and cultural milieu will enthrust investors, along with its fully-digital status, rich biodiversity and impressive travel connectivity by road, rail, sea and air.

The PPP model has hit hurdles in the country, necessitating changes in concession terms and more sops to industry. Kerala seems to have tried its hand in

certain PPP financing structures...

There are many types of PPPs we are employing to boost investments. The Kerala State Industrial Development Corporation has made headway in forging JV units with the industry. Another model is that of CIAL (Cochin International Airport Ltd) where the government retains the leadership role while HNIs and others have equity participation. The state's cooperative sector is very robust and resource-rich to harness private capital for development projects.

Hasn't militant trade unionism been the biggest hurdle to Kerala's development?

It is only propaganda, not the reality anymore. No industry that has set up shop here would say trade unions have been a problem for them.

But frequent, 'lightning' hartals have dented the state's image as an investment/tourist destination...

That is another issue. There is a general agreement among all quarters in the society that hartals at the drop of a hat should be avoided. We cannot, however, subscribe to the view that hartals should be banned as they have a utility as a mode of agitation; hartals may be resorted to at a certain stage (to mark protest). We are going to convene a meeting of all stakeholders soon and, possibly, a consensus might emerge on how to proceed on this matter.

There is a view that Kerala's social development and needs are not exactly compatible with many central schemes. Is there laxity on the part of the state as alleged in implementing such schemes?

We are getting a tiny share from the Centre to implement various social sector schemes, less than 10% in many cases. For instance, we have a pension scheme that benefits 42 lakh families and costs ₹7,000 crore annually, which is run with practically no contribution from the Centre. With the reduction in the Centre's share in such schemes, we are being forced to find alternative resources and this has put a burden on the exchequer. As for welfare schemes, Kerala cannot be treated at par with other states (that are socially less developed) as our needs and priorities are different.

The spirit of cooperative federalism is not being upheld by the NDA government and there is an undue further concentration of power at the Centre.

● GAGANYAAN

India must claim its space

MARTAND JHA

The author is junior research fellow, School of International Studies, Jawaharlal Nehru University



Lessons for India and ISRO from the American voyage to the moon

ONE SMALL STEP FOR man, one giant leap for mankind—these words by Neil Armstrong (first man on the moon) still echo that monumental achievement. The year 2019 marks the 50th anniversary of the feat. A lot has been written about NASA's Apollo mission that placed a man on the moon and made the US the most potent force in outer space, taking it ahead of its rival, the erstwhile Soviet Union. It is interesting to look at the conditions that persuaded the US to take steps towards a manned mission to the moon.

Prior to that, the US was lagging behind USSR, and the pressure was to outdo the Soviets, who were increasing the gap in technological superiority with successful space missions since Sputnik 1. In fact, 1957-61 can be termed as golden years of Soviet space programmes. In the US, the presidency changed from Dwight D Eisenhower to John F Kennedy. Many space historians have pointed out that under Eisenhower, the US was trying its best to beat the Soviet Union in the space race, but wasn't able to do so. The critics of Eisenhower, especially his political rivals including future Presidents like Kennedy and Lyndon Johnson, got an opportunity to target his administration's failures in the race.

Media portrayed it as the US losing the Cold War itself. The launch of the Sputnik by the Soviets was projected as a moment of crisis for the US and the term 'Sputnik crisis' came into being. This is despite the fact that NASA came into being as an institution under Eisenhower, and American engineers and scientists were working to change the 'perception' about the capability of the US in outer space. During 1957-61, the US was investing heavily in making NASA a premier space research and coordinating agency. Things took time because, unlike USSR, the US was democratic where every big and small decision was questioned, discussed, debated and scrutinised.

By the time Kennedy came to power, the perceived 'missile gap' between the US and USSR was doing a serious damage to the former's image as a superpower. Soviet cosmonaut Yuri Gagarin's space travel in 1961 turned the situation alarming, even though the US was launching more satellites than USSR. The time was now ripe for the Americans to make some big announcements to send a strong message.

On May 25, 1961, a month after Gagarin's feat, Kennedy delivered a speech to the joint session of US Congress: "US should commit itself to achieving the goal, before this decade is out, of landing a man on the Moon and returning him safely to the Earth. Recognising the head start obtained by the Soviets with their large rocket engines, which gives them many months of lead time, and recognising the likelihood that they will exploit this lead for some time to come in still more impressive successes, we nevertheless are required to make new efforts on our own. While we cannot guarantee that we shall one day be first, we can guarantee that any failure to make this effort will make us last."

The speech outlined the US space policy where Kennedy accepted that the Soviets were leading the race. A year later, on September 12, 1962, Kennedy announced that the US would be sending a man to the moon by the end of the decade. He remarked, "We choose to go to the Moon in this decade and do the other things, not because they are easy, but because they are hard; because that goal will serve to organise and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one we intend to win, and the others, too."

Although the task was extremely costly, taking this risk proved extremely successful for the US in the long run. This whole episode is a great lesson for the critiques of ISRO's Gaganyaan mission. What they need to understand is that for India to become a formidable space power, it needs to take risks—much like what the US did in the 1960s—to reap the benefits afterwards.

For India to turn into a formidable space power, it has to take risks—much like what the US did in the 1960s—to reap the benefits afterwards

Going beyond blood donation

The roadmap for creating an adequate and safe blood transfusion system in India

MADAN GOPAL

The author is senior consultant (Health), NITI Aayog. Views are personal

the minimum needed to meet a country's most basic blood requirements. In 2016-17, India's blood collection fell nearly 15%, or 1.9 million units short of this 1% benchmark. The WHO norm, however, is based on global averages and does not take into account India-specific factors and disease burden. Moreover, it is based on population need, assuming universal access to health services, while in reality the actual clinical demand of blood in healthcare facilities is lower.

Ideally, all blood need should be converted into clinical demand by ensuring access, enhancing infrastructure and improving health-seeking behaviour of the population. Even though India has adequate blood banks to cater to its population, these are unevenly spread across

geographies. The gap between need and actual demand should instead be met by focusing on efficient functioning and service delivery as well as infrastructure development of existing facilities.

To improve access and availability without additional resource commitments, there is a scope for institutionalising the partially centralised hub-and-spoke model, where a fully equipped centralised blood centre can cater to multiple satellite blood banks or storage centres performing limited functions. Blood delivery within this model can further be strengthened through innovative technologies, and already some start-ups are exploring drone delivery.

It is imperative for national estimates to be updated periodically to accurately



estimate need and demand, and compare these against blood utilisation. NACO's first Blood Requirement Estimation conducted in 2017 was a step in this direction; it pegged blood demand at 26.5 million units. To meet this demand, a ready pool of healthy low-risk donors needs to be maintained through promotion of voluntary non-remunerated blood donations. There is immense scope for mobilising the private sector to encourage blood donation in fulfilment of their social responsibility.

Another means of ensuring adequate blood supply using the existing donor pool is by reducing dependence on whole blood. The WHO recommends a 90:10 ratio for use of blood components and whole blood (only limited clinical interventions require whole blood). Collections of blood compo-

nents through apheresis or component separation after whole blood collections are means of inching closer to this ratio.

Ensuring blood safety through operational and technological initiatives: Major improvements will have to be made at blood-bank level, as many blood banks don't have proper standard operating procedures (SOPs), even though these are regulatory requirements. Recently, the NITI Aayog, along with Terumo BCT, conducted a blood bank assessment in Sonbhadra, an aspirational district in Uttar Pradesh, and preliminary results show that focusing on rigid processes and commensurate training of staff can go a long way in improving blood safety.

Model donor selection and donor referral processes are also prescribed by the

NBTC to reduce risk of transfusion transmitted infections (TTIs), which endanger patient safety—between 2014 and 2017, 1.58% of the blood collected was discarded due to reactivity for TTIs. Logistical factors like expiry of components or deterioration during storage also contribute to wastage. The risk of infection and quantum of blood wastage can be reduced through maintenance of process integrity, and adoption of advanced, economically-pragmatic technologies. NITI Aayog's experience with disruptive technologies across sectors has been positive, and even in the blood space, promoting advanced screening like NAT and ELISA along with pathogen reduction technologies can reduce the burden of TTIs.

In 2016, the ministry of health and family welfare launched e-Rakt Kosh, an ICT-enabled Blood Bank Management Information System that interconnects all blood banks in a state into a single network, and there is a scope to scale up its usage. For blood banks, it is a tool to standardise and streamline SOPs and workflow. Its citizen interface assists potential donors and patients, giving real-time information about nearest blood banks, donation camps, and blood availability including of a particular blood group.

India is on the right track to strengthen its existing blood transfusion system, but uniform implementation of policy guidelines, adoption of innovative technology, and collaboration between public and private sector is imperative in ensuring translation of policy objectives into action.