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Digital Planet
Where Digital Innovation Meets the World

Digital Light at the End of the COVID Tunnel for India?

How to Translate Digital Momentum into Job Creation and Recovery Beyond the Pandemic

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The Fletcher School, Tufts University

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About

Digital Planet

Digital Planet, an interdisciplinary research initiative of The Fletcher School's Institute for Business in the Global Context, is dedicated to understanding the impact of digital innovations on the world and providing actionable insights for policymakers, businesses, investors, and innovators.

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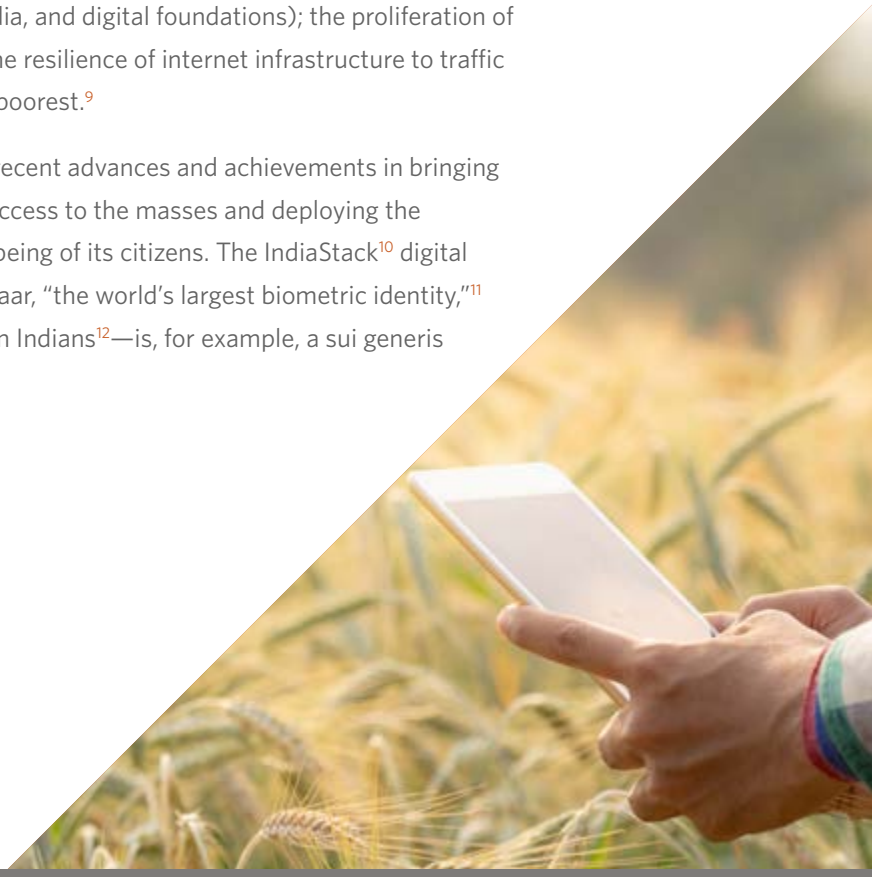
Executive Summary

The "great lockdown" in the wake of the COVID-19 pandemic has plunged the global economy into the worst economic downturn since the great depression.[1] As of this writing, the novel coronavirus has infected 10 million people globally, claimed the lives of nearly 500,000,[2] and impacted the livelihoods of hundreds of millions,[3] as countries struggle with the grim calculus involved in protecting both public health and economic health.

India's already precarious economic situation at the start of 2020—hobbled as the country was by a combination of lagged knock-on effects of ill-conceived policies like demonetization[4] and a lack of bold ideas in planning for the future[5]—was only exacerbated by one of the most stringent global lockdowns in the second half of March, which brought the economy to a virtual standstill and put over a fourth of the labor force out of work.[6] A phased reopening at the end of May has left the country in the difficult position of fielding a large and growing outbreak[7] while its fragile healthcare system is being pushed to the brink.[8] India's state of readiness for socially distant work and business continuity leaves much to be desired. In our recent research on readiness for remote work, in light of lockdowns worldwide, we scored 42 countries on several crucial dimensions: the robustness of key platforms essential to business continuity (technology-mediated remote work, e-commerce, digital media, and digital foundations); the proliferation of digital payments to facilitate transactions; and the resilience of internet infrastructure to traffic surges. Of the countries studied, India fared the poorest.[9]

This lack of readiness is in spite of India's many recent advances and achievements in bringing digital identity, financial inclusion, and internet access to the masses and deploying the best available technologies to advance the well-being of its citizens. The IndiaStack[10] digital infrastructure—built on the foundations of Aadhaar, "the world's largest biometric identity,"[11] introduced in 2009 and issued to over 1.25 billion Indians[12]—is, for example, a sui generis accomplishment.



Equally admirable are the sheer size and scale of India's digital consumption and economic ambitions. India is already the second-largest internet market, behind China; its 600 million active internet users[13] have been consuming nearly three times as much data on their phones as Americans.[14] It is all but true that "Indians will be data-rich before they become economically rich."[15] India, furthermore, is unique in its stated aim of achieving a $1 trillion digital economy by 2025,[16] with its digital economy expected to account for a fifth of its overall goal of transforming into a $5 trillion economy over the next five years.[17] The COVID-19 shock has rendered this aspiration all the more bold.

The pre-COVID moment was ripe with possibility. Putting aside the enormous disruptions caused by the pandemic, India, like several economies of the "digital south," has been experiencing a confluence of several trends: urbanization, a youthful demographic bulge, and the fierce urgency of overcoming immediate physical obstacles to progress. All of these pointed to the potential for a "digital dividend." With or without the COVID shock, the moment is now for India to forge a pathway for Indians to translate the recent surge in digital uptake and accompanying data affluence into economic well-being and a higher quality of life in this decade.

This brings us to the central theme of this report: the progress that India has experienced in its digital inclusion has not, in any meaningful way, translated into inclusion in the form of economic opportunities. To be sure, this dichotomy isn't unique to India; large swaths of the digital south are faced with the same inclusion paradox.[18] Can digital uptake be a lever for rebuilding economic momentum and job growth, which will be sorely needed as India attempts to recover from the downturn in the wake of COVID-19?

We posed such questions at "India's Digital Turn,"[19] an open-forum interactive event in February 2020 informed and inspired by this research, where our featured Catalysts—representatives from the global investment community, a philanthropic foundation, India's leading e-commerce platform, the investment promotion agency of the Government of India, and a global pharmaceutical firm—led discussions on the structural and infrastructural changes required in the near, medium, and long term for India to realize its digital ambitions. That dialogue with experts informed many of our recommendations presented here.

This report provides a bespoke benchmarking framework as a tool for policy prioritization and action to realize the potential of a digitally enabled India. It is designed as a blueprint for policymakers and decision-makers tasked with translating the ideal of "digital inclusion for everyone" into "economic growth opportunities for all." The framework is predicated on the use of international benchmarks as a policy tool. We find that benchmarking is an effective mechanism for identifying and evaluating the size of the gaps between one's performance and the comparable performance of peers both near and aspirational, and this analysis can form the basis for policy prioritization, goal setting, and resource allocation. The approach builds on our recent research

from the *Ease of Doing Digital Business 2019* scorecard, which measures various parameters of the barriers and boosters to entry, growth, and exit of digital businesses across 42 countries, using 236 variables.[20] The data for this analysis is drawn from over 60 data sources, comprising public databases such as those from the World Bank and the World Economic Forum; subscription services such as GSMA Intelligence and Euromonitor; and proprietary sources such as Akamai, Chartbeat, and the Private Capital Research Institute.

The underlying logic of our framework is inspired by a key rationale that drives the World Bank's *Doing Business* survey: reforms create jobs—i.e., the easier it is to do digital business in a country, the greater the job-creation potential of said businesses.[21] The four types of digital platforms in our study—e-commerce platforms, digital media, sharing-economy platforms, and online freelance—serve as both the leading indicators of digital business opportunities, writ large, in a country and the job-creation potential, for high-skilled, low-skilled, and medium-skilled workers, of digital businesses. The questions that guide our benchmarking framework include:

- What needs to be true for India to translate the digital inclusion of the many into data-enabled jobs and inclusive economic growth opportunities for as many?
- What are the "levers of ease" for creating jobs in the digital economy?
- Where are India's gaps relative to its aspirational and near peers?
- What actions—in the near, medium, and long term—would India do well to take to close these gaps as a means of unlocking the dividend trifecta (digital, demographic, socioeconomic)? And in what order of priority?

In the spirit of creating aspirational yet realistic benchmarks for this study, in addition to China, we fashioned two mythical nations from peer groups to which India belongs: the Group of Twenty (G20)[22] and the BRICS club.[23] From the latter group, we combined the best attributes—that is, the maximum scores achieved by any one of the four members, Brazil, Russia, China, and South Africa (the "best of BRCS" or just "BRCS")—as if the benchmark were another country. For the former, we combined the median scores of the G20 members on all the constituent indicators in our model as if the benchmark were another country.[24] While comparisons with China carry some value, given the two countries' larger geo-strategic context, besting the BRCS would only get India somewhat closer to the goal of a truly inclusive digital economy; the best-performing BRCS member still ranks only 49th on many dimensions of the Human Development Index, so this is at best a stepping stone. The truly aspirational, North Star goal for India is to reach at least the median of the G20 on the disaggregated measures, given India's above-the-median standing in that group on the aggregate, with China and the BRCS as milestones along the way. In other words, by getting from where it is

today on a variety of measures pertaining to the ease of creating digitally enabled jobs to the median of the G20, India would have realized its stated goal of fostering a trillion-dollar inclusive digital economy by 2025.

There are several implications that emerge from this analysis. Our "deep dive" considers how India stacks up against the three benchmarks and informs a set of specific near-, medium-, and long-term recommendations for changes that can move India to the G20 median on all disaggregated measures. The main takeaways and conclusions from our report are summarized below.

- In the near term, we recommend that the Indian government evaluate existing policies and practices to reduce conflicting regulatory roadblocks that impede the growth of the digital economy. Improvement of India's digital and analog foundations by 79% and data accessibility by 44% would help the country reach parity with the G20 median. Second, the government should continue to improve data accessibility and relax data localization policies. Finally, India's progress in the World Bank's *Doing Business* ranking has thus far been impressive; continued momentum here, particularly in reducing red tape and encouraging cross-border trade, would be beneficial in advancing the goal of digitally enabled job creation. For instance, our analysis shows that a 19% reduction in the time and cost to import/export goods cross-border, a 14% improvement in the efficiency of customs procedures, and a 75% improvement on the indicator that addresses the ease of gaining permits and registering property can push India to meet the G20 median. To further facilitate cross-border transaction, India could reduce the average time spent on filing taxes by 39% and promote cross-border e-invoicing for electronic payments and digital trade to ease blockages for online freelance activity.
- In the medium term, we recommend that India harness its impressive digital momentum and take a more inclusive view of digital development. The government should focus on improving the quality of digital services, expanding connectivity, and promoting inclusion. Closing the gender and urban–rural gaps would serve as a strong driver of employment. Connectivity is an area where India is falling behind, but it is a fundamental ingredient in digitally driven job creation. An improvement of just 6% on connectivity will cover more than 99% of the population with at least 3G services. The commitment needed to boost connectivity to competitive levels will require action and cooperation from both the private and public sectors. A reduction of 40% in the market entry barriers to FDI in infrastructure, an improvement of 13% on the indicator for FDI regulations, and improvement of 43% in market competition in the e-retail sector can facilitate market competition across industries and help India close the gaps with the G20 median, unlocking inclusive digital economic

growth. Besides improving connectivity, an increase in access to e-payment platforms by 17% will help close the gender and urban–rural gaps, facilitating digital development among hard-to-reach and less-developed regions.

- Lastly, in the long term, the government would do well to focus on upskilling its labor force and improving the quality of education at all levels. Because of its large agricultural sector, India suffers from seasonal employment patterns and a labor force that largely lacks the skills to succeed in a digital future. More than half of university graduates, according to employers, do not have the job skills that are increasingly desired or necessary. Rather than targeting the most elite, highly educated Indians for upskilling, a small part of the population, the government should focus on the rest of the pyramid, including rural and less-educated communities and those with university degrees who lack the skills employers require.

A mere return to normal in post-COVID India will not be sufficient to meet the enormity of the employment challenge facing the country. Unlocking the dividend trifecta—digital, demographic, and socioeconomic—requires putting well-designed policies into practice. As the country continues its long battle with COVID-19, we hope that policymakers fully recognize the potential of digitally enabled jobs and will work to harness the country's digital momentum, finding light at the end of the tunnel.

Context

"The frustrating thing about India," the famous Cambridge economist and Indophile Joan Robinson once said, "is that whatever you can rightly say about India, the opposite is also true."[25] Indeed, it is a land of great contradictions: the fifth largest economy in the world is also home to over a fifth of the world's extreme poor.[26] India has near gender parity in graduate-level STEM education, surpassing the UK and the United States,[27] but women also bear the brunt of disparity; they account for a disproportionate share—nearly two-thirds—of India's illiterate population of 313 million.[28] The country boasts the longest written constitution in the world,[29] which enshrines many fundamental rights, including the right to internet access for all of its citizens,[30] but it also has the dubious honor of the longest wait for justice in the world, with 27 million court cases caught in the backlog.[31]

These contradictions aren't limited to the realms of economy, education, and enactment; they are omnipresent and as much a feature of India's digital domain as they are physical. Incongruities between the country's robust digital growth in recent years and the weak analog foundations it rests on[32] are all too apparent from India's position in what we have described in our earlier work as the "break-out zone"—characterized by a low score in the absolute state of digitalization[33] and significant forward momentum—in the Digital Evolution Index, our multi-year analysis of the digital competitiveness of economies around the world.[34] India straddles the bottom quartile for the state of digitalization and the top quartile on digital momentum.[35] India's digital momentum is buoyed by many factors: rising consumer demand; a flood of investments, in the billions of dollars,[36] into bespoke innovations and services pursuing a share of the growing and lucrative pool of user data, or "gross data product";[37] a surge in digital inclusion initiatives in recent years;[38] and the voracious appetite of the Indian consumer for all manner of over-the-top (OTT) services.[39] These transformations have been made possible by the mobile internet. Despite this momentum, however, persistent gaps in the quality of broadband inclusion,[40] core infrastructure, institutional capacity, and policy coherence have beset India's digital progress.

We suspect that Professor Robinson, if she were around today, would be frustrated with digital India as well. On the one hand, India is among a small, laudable group of countries that recognizes internet access as a fundamental right. On the other hand, it leads the world in internet shutdowns: in 2018, the country accounted for over two-thirds of the total shutdowns recorded worldwide.[41] Nor would Robinson be alone in her frustration. Consider the travails of e-commerce platforms such as Amazon and Walmart ,[42] who have come to realize that regulators in India treat online retailers differently. Despite investor enthusiasm, for a digital

business, India remains a difficult market to enter and in which to operate and grow. As we noted in our *Ease of Doing Digital Business 2019* scorecard,[43] a data-driven assessment of the many nuances of digital-business friendliness in 42 countries around the world, India ranks in the bottom quartile of countries in several dimensions crucial to creating a welcoming environment for digital businesses to take root and thrive.

In all fairness, the country's recent achievements in bringing digital identity, financial inclusion, and internet access to the masses and deploying the best available technologies to advance the well-being of its citizens are admirable in many respects. The IndiaStack[44] digital infrastructure—built on the foundations of Aadhaar, "the world's largest biometric identity,"[45] introduced in 2009 and issued to over 1.25 billion Indians[46]—has facilitated over 42 billion authentications to date, of which a fifth are eKYC transactions to aid in such activities as the opening of bank accounts and the acquisition of mobile phone subscriptions. In addition to paving the way for the financial inclusion of over 300 million hitherto unbanked Indians,[47] this digital infrastructure has been crucial in facilitating the delivery of public services such as food aid, subsidies,[48] and direct benefit transfers straight into the hands of those who need them.[49] In our most recent study of governments' readiness and ability to deliver public services online during the "great lockdown"[50]—for which we measured the availability and reach of digital public-services infrastructure and affordable internet access in 42 countries—India has a mixed record. It fares better than Brazil, South Africa, Mexico, and Indonesia but falls well behind the capabilities of China, Russia, South Korea, and a few other members of the G20.

In terms of size, as measured by the number of users, India, with over 600 million active internet users and ample headroom for further growth,[51] is already the world's second-largest internet market, behind China. India's base of internet users, twice that of the United States, has been "consuming nearly three times as much data on their phones as Americans."[52] It is all but true that "Indians will be data-rich before they become economically rich."[53] Insofar as consumption is a meaningful yardstick for material well-being and quality of life,[54] and digital consumption is the backbone of a strong digital economy, as the internet becomes central to the way societies buy, sell, dwell, work, play, and pay, they will be poised to foster robust digital consumption societies and digital economies. So goes the conventional wisdom. However, here's the rub: most digital consumption activity in India has been concentrated in what is being termed the "timepass economy";[55] in other words, more digital time is spent in the pursuit of leisure and less is spent on productive work and gainful employment.[56]

India's complex challenges were laid bare by the COVID-19 outbreak, whose impact continues to expand at an alarming rate at the time of this writing. The public health catastrophe has, undoubtedly, been devastating to lives and livelihoods in India, as it has been elsewhere in the world. It has been a test of the resilience of the people, of the country's leadership, and of the

economy—the latter two of which have not done well on the test thus far. The accompanying lockdown has also turned out to be the purest test of the internet and its centrality to the economy. In our recent research on readiness for socially distant work, in light of lockdowns worldwide, we scored the same 42 countries mentioned above on several crucial dimensions: the robustness of key platforms—technology-mediated remote work, e-commerce, digital media, and the country's digital foundations—essential to business continuity; the proliferation of digital payments to facilitate transactions; and the resilience of the internet infrastructure to traffic surges. Of the countries studied, India fared the poorest.[57] This performance sheds light on the many gaps in the core infrastructure undergirding IndiaStack and on the inescapable fact that digital uptake does not necessarily translate into an uptick in economic productivity or resilience.

This brings us to the central theme of this report: the progress that India has experienced in its digital inclusion has not, in any meaningful way, translated into inclusion in the form of economic opportunities. To be sure, this dichotomy isn't unique to India; large swaths of what we have elsewhere called the "digital south" are faced with the same inclusion paradox.[58] Can the digital uptake be a lever for rebuilding economic momentum and job growth, which will be sorely needed as the country attempts to recover from the downturn resulting from the COVID-19 outbreak?

India is unique in its stated ambition of achieving a $1 trillion digital economy by 2025,[59] with its digital economy expected to account for a fifth of its overall goal of transforming into a $5 trillion economy over the next five years.[60] These were already bold aspirations, but the after the COVID-19 shock, they may seem even bolder, if not impossible goals. Not realizing this national trillion-dollar digital dream would be unfortunate. Embedded in it are the dreams and aspirations of hundreds of millions of Indians yearning for a ticket to economic inclusion and a fair shot at a life of dignity.

The pre-COVID moment was ripe with possibility. Putting aside the enormous disruptions caused by the pandemic, India, like several economies of the digital south, has been experiencing a confluence of several trends: urbanization, a youthful demographic bulge, and the fierce urgency of overcoming immediate physical obstacles to progress. All of these pointed to the potential for a "digital dividend."

Urban migration has been a constant of independent India's existence, and this has only accelerated post-liberalization.[61] By the middle of this century, more Indians are projected to live in cities than in villages.[62] Cities have been and will continue to be the consumption and growth engines of the country. The Gandhian idyllic notion of a nation whose growth "depends not on cities but its villages" is no longer central to India's reality.[63] Today, more than ever, the well-being of India's villages is deeply intertwined with the prosperity of its cities. Three out of every

10 Indians are estimated to be internal migrants of some kind,[64] and a vast majority of them are migrant laborers from the villages to the cities. Migrant workers from the hinterland to India's cities[65] were supporting their families in the villages with domestic remittances to the tune of $25 billion annually.[66]

The peak of the much-anticipated and simultaneously anxiety-inducing demographic youth bulge,[67] with close to a billion working-age adults seeking gainful employment,[68] will happen in this decade,[69] also at a time when the country will become home to nearly a billion data-hungry internet users.[70] As of this writing, a genuine demographic dividend looks uncertain: with aggregate unemployment hovering around 7%, and twice that number among those with tertiary education (pre-COVID 19),[71] what was an already precarious economic situation at the start of 2020—hobbled by a combination of lagged knock-on effects of ill-conceived policies like demonetization[72] and, as we have argued, a lack of bold ideas in planning for the future[73]—has only been exacerbated as India is now forced to confront the grim calculus of addressing both deteriorating economic health and fragile public health.[74]

Looking beyond the pandemic, however, these trends are accompanied by tailwinds that facilitate digital uptake and productive use. Urban agglomerations lend themselves well to the provision of digital products and services by businesses and governments, given the relatively lower last-mile effort and resources needed to reach a large population of consumers;[75] as a corollary, with an increasingly urban and digitally connected young population, India has a rare and brief decade-long window of opportunity to nurture digitally enabled jobs as a lever to foster inclusive economic growth and catapult its economy, thus playing catch-up and achieving substantive socioeconomic parity with its upper-middle-income peers,[76] such as Brazil, China, Russia, and South Africa, and even competing with its more inclusive and prosperous peers in the G20.

With the restrictions imposed by the COVID-19 pandemic, the need to rely on digital technologies has never been clearer. In the absence of purely service and manufacturing jobs, every other sector of the economy relies on a digital connection, even if it is to order food or product or service delivery during a lockdown. With or without the COVID shock, the moment is now for India to forge a pathway for Indians to translate the recent surge in digital uptake and accompanying data affluence into economic well-being and a higher quality of life in this decade.

How and whether India succeeds matters not just to its 1.35 billion citizens; it matters as much to the additional billions living in large swaths of the digital south who could benefit from a role model of India's size and complexity. It also matters immensely to the entire liberal democratic world order that thrives on open and inclusive internet economies. All these economies are looking for ways to recover after the blow dealt by the pandemic. The stakes couldn't be higher.

It is within this transitional context of converging trends combined with the urgent imperative for recovery that we present our framework for policy prioritization and action to realize the potential of a digitally enabled India. This is a blueprint for policymakers and decision-makers to translate the ideal of "digital inclusion for everyone" into "economic growth opportunities for all." The framework is predicated on using international benchmarks as a policy tool. We find that benchmarking is an effective mechanism to identify and evaluate the size of the gaps between one's performance and that of peers—both near and aspirational—and form the basis for policy prioritization, goal setting, and resource allocation.

The rest of this report provides a bespoke benchmarking framework as a policy tool. The approach builds on our recent research from the *Ease of Doing Digital Business 2019* scorecard, which measures various parameters of the barriers and boosters to entry, growth, and exit of digital businesses across 42 countries, using 236 variables.[77] The data for this analysis is drawn from over 60 data sources, comprising public databases such as those from the World Bank and the World Economic Forum; subscription services such as GSMA Intelligence and Euromonitor; and proprietary sources such as Akamai, Chartbeat, and the Private Capital Research Institute (for a complete list, please see the Data Sources section at the start of this report).

As an important caveat, we note that these data and analyses preceded the pandemic. Once new information accumulates and the impact of COVID-19 is captured in the data, we hope to conduct the research and analyses again.

The underlying logic of our framework is inspired by a key rationale that drives the World Bank's *Doing Business* survey: reforms create jobs—i.e., the easier it is to do digital business in a country, the greater the job-creation potential of said businesses.[78] The four types of digital platforms in our study—e-commerce platforms, digital media, sharing-economy platforms, and online freelance—serve as both the leading indicators of digital business opportunities, writ large, in a country and the job-creation potential, for high-skilled, low-skilled, and medium-skilled workers, of digital businesses. The questions that guide our benchmarking framework include:

- What needs to be true for India to translate the digital inclusion of the many into data-enabled jobs and inclusive economic growth opportunities for as many?
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- Where are India's gaps relative to its aspirational and near peers?
- What actions—in the near, medium, and long term—would India do well to take to close these gaps as a means of unlocking the dividend trifecta (digital, demographic, socioeconomic)? And in what order of priority?

While our analysis in this particular report is India-centric, the measurement framework we have developed is versatile and applicable to a variety of national contexts. Our hope and aim is that this prototype data tool—the benchmarking framework—and its underlying foundation, the *Ease of Doing Digital Business 2019* scorecard, will together help to inform and guide policy decisions around digital transformation not just in India but across the digital south, where governments are faced with a similar convergence of long-term trends, a jobs conundrum, a pressing need to unlock their dividend trifecta, and a ticking clock.

An Introduction to Our Benchmarking Framework

Our Choice of Benchmarks: Why China, BRICS, and the G20?

To develop a systematic plan for outlining a concrete set of policy actions and setting priorities aimed at improving the ease of creating jobs in the digital economy, we think it is essential to have a comprehensive framework as well as a system with which to set benchmarks—with near and aspirational peers—to enable decision-makers to identify the key gaps to be closed.

Before getting into the details of the framework and its constituent parts, a brief discussion of our choice of benchmarks for this research is perhaps in order. When stacked up against countries in the break-out zone alluded to earlier[79]—i.e., India's peer countries as seen through the lens of state and rate of digitalization, viz., the Philippines, Nigeria, Mexico, and Poland, from the table-setting phase of this India-centric research, published in May 2019[80]—we found that India performs poorly on measures of public health, environment and quality of life, and inclusivity but comes out ahead of this group of emerging-market peers on several other measures, such as talent development, education and skill-building, innovation, state of trust in institutions, and public services. One of the leading insights from the earlier study was that, while India has a long way to go in building the requisite levels of job-ready skills and education among the country's abundant labor pool, it performs the strongest in the area of talent when compared to the emerging-markets benchmark basket in this table-setting study—specifically, in terms of having one of the deepest reservoirs of the tertiary-educated talent that is most attractive to global digital freelancing platforms.

Whereas the fellow emerging markets mentioned above are India's actual peers, given their many shared characteristics of digital evolution and analog foundations, India's aspirational peers—i.e., countries and groups that it seeks parity with, likes to rub shoulders with, and, most importantly, covets comparisons with—are quite rightly upper-middle-income and high-income economies, even as India is still deemed a lower-middle-income economy.[81] Indeed, to realize a trillion-dollar digital economy that accounts for a fifth of its overall economy by 2025, India needs to aim at aspirational benchmarks and countries that perform better than itself.

Our chosen benchmarks for this study, therefore, are China and two peer groups to which India belongs: the Group of Twenty (G20)[82]—a global forum representing 80% of the world's economic output and gathering leaders of both developed and developing countries for international

economic cooperation—and the BRICS club,[83] comprising the emerging regional economies of Brazil, Russia, China, and South Africa (all members of the G20, as well), who are committed to, among other things, convening for an annual summit.

The case for China as a benchmark is self-evident, given the geopolitical rivalry between the two countries and their tussle for regional influence. On one count, population size, India is set to overtake China in this decade,[84] which has some implications for digital growth; India's number of internet users in 2020 is two-thirds that of China. From the standpoint of the economy, however, China is a formidable benchmark for India. China's economy in 2018, at $13.61 trillion, was five times that of India. According to the International Monetary Fund, China's digital economy accounts for about 30% of its GDP,[85] which in itself is one-and-a-half times the size of India's entire economy. Among the BRICS, while India's economy is second to China's, the digital economies of India, Brazil, Russia, and South Africa are somewhat comparable in size.[86] Among the G20, India's economic size and heft place it well above the median; it is the fourth largest economy in this group by GDP.[87]

While India is very much a near-peer among these groups at an aggregate level, the disaggregated data paint a different picture. India is far from the median G20 economy and lags behind its BRICS peers. On a GDP per capita basis, India is at the very bottom of the G20 and BRICS leagues;[88] globally, by GDP per capita, it ranks 126th.[89] On a variety of human development measures, India scores rather poorly; it is in 129th place among 189 nations around the world in the 2019 Human Development Index. China, Russia, South Africa, and Brazil ranked 85th, 49th, 113th, and 79th, respectively, with G20 members' median rank at 26th.[90]

On measures of basic physical infrastructure, India lags behind these benchmarks. While the country can claim to have closed the urban–rural digital divide, 10.7% of its rural population still lacks access to electricity,[91] 7% of the population cannot access basic drinking-water services,[92] and an astonishing 40% of the population does not have basic sanitation services—a stark contrast to the 100% coverage found in the G20 median across all these measures.[93]

While India is a large and rapidly expanding digital market, with affordably priced 4G data, its quality of bandwidth leaves much to be desired. An analysis by Opensignal shows that India—perhaps a victim of its own success—has one of the most congested networks around the globe, with a large gap between peak-hour and average speeds.[94] India's 4G coverage—not penetration—is around 90% of the population, but the average 4G speed is only 6.8 Mbps in India, compared to 23.2 Mbps for the G20 median in 2019.[95]

It is for all of the reasons mentioned above that we chose China, the BRICS without India—i.e., the BRCS—and the G20 as benchmarks for India to measure itself against. While comparisons with China carry some value, given the two countries' larger geo-strategic context, besting the

BRCS would only get India somewhat closer to the goal of a truly inclusive digital economy; the best-performing BRCS member still ranks only 49th on many dimensions of the Human Development Index, so this is at best a stepping stone. The truly aspirational goal for India is to reach at least the median of the G20 on the disaggregated measures, given India's above-the-median standing in that group on the aggregate, with China and the BRCS as milestones along the way. In other words, by getting from where it is today on a variety of measures pertaining to the ease of creating digitally enabled jobs to the median of the G20, India would have realized its stated goal of fostering a trillion-dollar inclusive digital economy by 2025.

In the spirit of creating aspirational yet realistic benchmarks, in addition to China, we fashioned two mythical nations as benchmarks: one that combines the best attributes of (that is, the maximum scores achieved by) any one of the four BRCS countries (Brazil, Russia, China, and South Africa; this is hereafter referred to as the "best of BRCS" or just "BRCS"), as if the benchmark were another country, and one that combines the median scores of all the constituent indicators in our model of the G20 members,[96] as if that benchmark were another country. That these are actual scores demonstrated to be feasible by at least one of these nations makes them realistic; our methodology of combining these best (for BRCS) and median (for G20) attributes to create the composite makes the benchmark aspirational, since no single nation achieves said composite scores, thereby allowing us to assess India's performance against these benchmarks. Our hope is that this serves several purposes:

- First, it sets a standard for policymakers based on specific outcome measures that are demonstrated to be feasible. It serves as a tool for policymakers, technologists, bureaucrats, and other decision-makers in India to evaluate the country's progress in realizing the vast economic value that a digital society can bring. It may thus enable a dialogue among the key actors and the creation of a plan of action to study the potential for digital technologies to close the gaps, unlock public value, and achieve desired societal outcomes.
- Second, it helps these key players identify and pinpoint the areas of strength and weakness in India's digital economy and ease of creating digital jobs, equipping policymakers with quantifiable levers that they can toggle to get to said benchmarks.
- Third, the benchmarking exercise has the potential to be adapted to other countries that could benefit from a similar analysis, i.e., by measuring themselves against a composite of global markets, assessing and developing the tools to advance their digital economies, and unlocking the economic potential fostered by a digitalized society.

Building the Benchmark

In keeping with the logic that reforms create jobs—that the easier it is to do digital business in a country, the greater the job-creation potential of said businesses—we developed a handy proxy to translate the four types of digital platforms measured in our *Ease of Doing Digital Business 2019* scorecard into their job creation potential, as follows:

E-commerce platforms and their corollaries, the kirana network of third-party retailers, and last-mile delivery businesses → Low-skilled jobs

Sharing-economy platforms (i.e., asset sharing, such as ride-share and home-share) and their corollaries → Medium-skilled jobs

Digital media, online freelancing, and their corollaries → High-skilled jobs

We retained the foundational factors—i.e., the analog and digital infrastructure aspects and related policies—as is (see Table 1).

TABLE 1: A DEEPER VIEW OF THE MAIN COMPONENTS

Foundational Factors	Low-Skilled Jobs	Medium-Skilled Jobs	High-Skilled Jobs
	Supply		
Data Accessibility The extent to which data easily moves across and within borders, including the intensity of data flows and data restrictions. This is a measure of the free flow of data as well as government openness to sharing anonymized data publicly, and policies in place to safeguard user privacy.	Fulfillment, Transaction, Connectivity	Availability of Idle Assets, Plurality of Transportation, Plurality of Accommodation Options, Connectivity	Freelancing Activity, Export Flow of Local Content, Import Flow of Global Content, Flow of User-Generated Content, Drivers to Hire Freelancers, Connectivity
	Institutions		
Digital and Analog Foundations Indicators descriptive of foundations i.e., the Demand, Supply, Institutions, and Innovation conditions—essential for all digital platforms.	Ease of Fulfillment, Ease of Cross-Border Trade, Ease of Market Entry	Government Stance on Asset-Sharing, Level of Security, Public Acceptance	Transaction Enablers, Worker Protection, Enablers to Creation of Local Content, Access to Global Content, Freedom of Expression
	Market Sophistication		
World Bank Doing Business *Doing Business* Distance to Frontier measure for 2019, representing how far a country performs compared to the best possible.	Consumer Sophistication, E-Commerce Usage	Market Characteristics, Ride Sharing Platforms, Home Sharing Platforms, Trust	Educational Attainment, Skill Supply, Consumer Sophistication, Digital Media Usage, Media Monetization

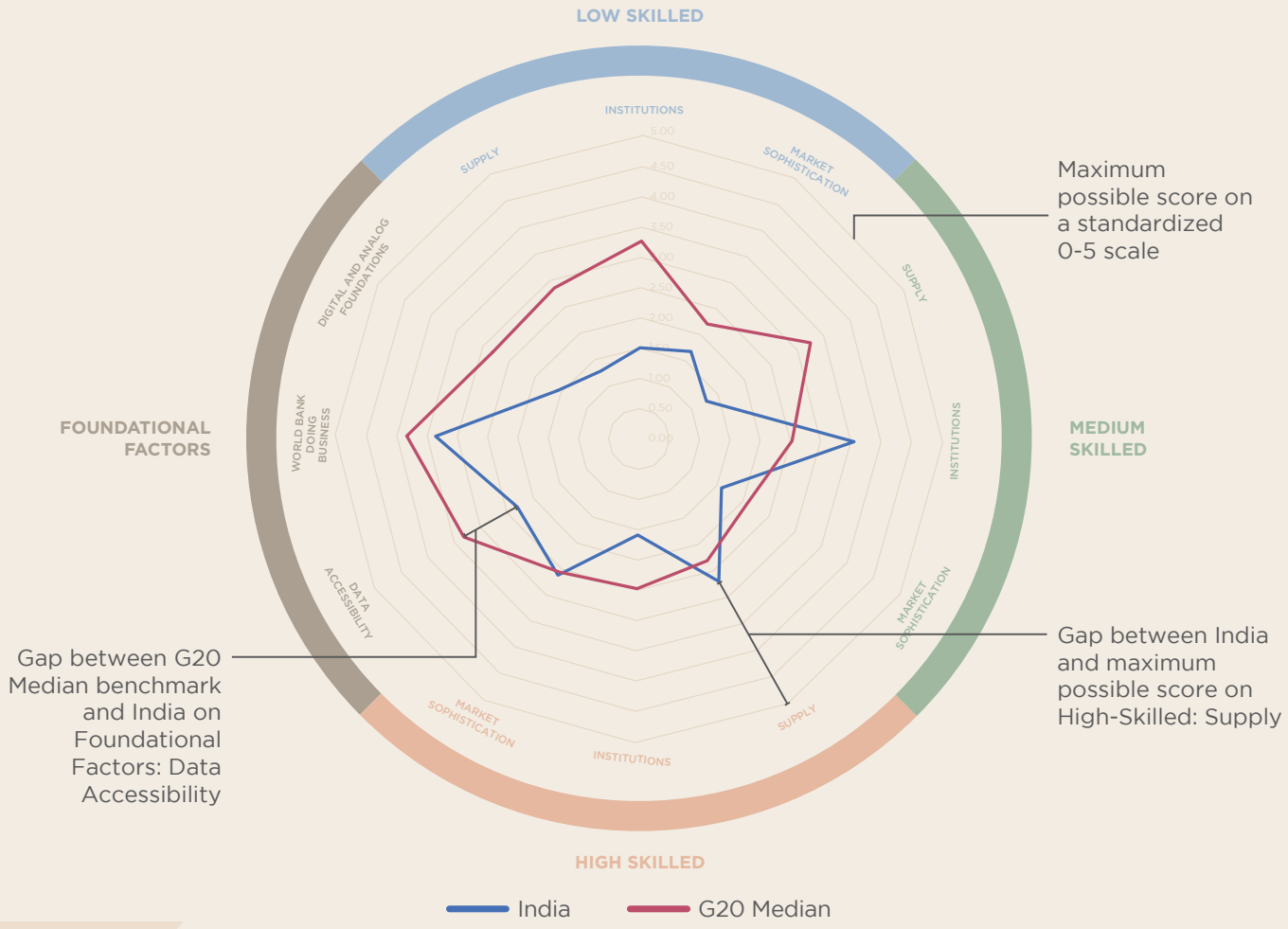
We mapped India and the benchmarks against the 12 component measures detailed above, spread over foundational factors and the "levers of ease" of creating high-skilled, medium-skilled, and low-skilled jobs in the digital economy. Each job-skill lever consists of three key components: Supply Barriers and Boosters, Institutional Barriers and Boosters, and Market Sophistication.

Taking the G20 median benchmark vs. India as an example, in our visualizations, the outer ring boundary represents the maximum score a country or a benchmark can get on a standardized 0–5 scale (see Exhibit 1). The G20 median benchmark is constructed using the median score on each indicator level among the G20 members, aggregated at the cluster, component, and driver levels. (For a detailed explanation of how these scores were calculated, please refer to the Methodology section at the end of this report.)

The outcomes of this exercise are illustrated in the exhibits to follow and detailed in the rest of the report. The distance from the center represents higher scores along each of the 12 components, and the lines connecting each country's component scores across all 12 components is that country's, or a constructed benchmark's, "ease of creating digital jobs footprint." The outer boundary represents the highest and best possible scores a country can get on a 0–5 standardized scale, which is difficult to achieve realistically. As represented in Exhibit 1, even an ambitious benchmark of a mythical nation—the G20 median—still has some gaps to close, compared to an outer-boundary scenario. The distance between India and the G20 median benchmark is the size of the gap that India needs to close to reach the level of said benchmark. A comparison of the footprints provides insights into the areas where India leads and lags compared to the benchmark.

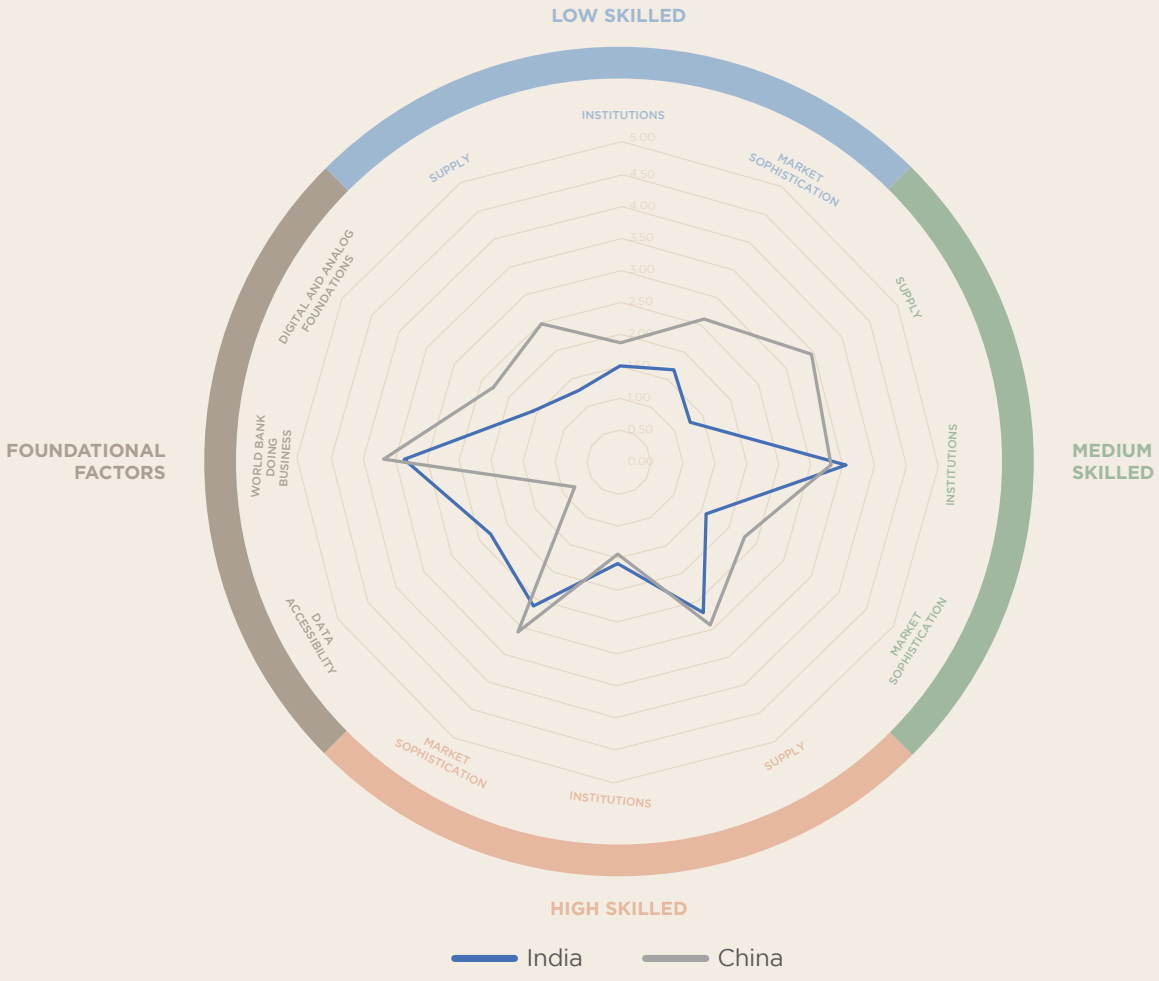
EXHIBIT 1: HOW TO READ THE CHART

INDIA VERSUS G20 MEDIAN



Ease of Creating Jobs in the Digital Economy

EXHIBIT 2: ANALYSIS | INDIA VERSUS CHINA



China: Harnessing e-Commerce Platforms and Their Corollaries for Job Creation

China, home to 1.39 billion people,[97] accounts for one-fifth of the world's four billion internet users,[98] 40% of the total value of global e-commerce transactions,[99] and about 40% of the global 5G infrastructure market.[100] And yet, the country's ease of creating digital jobs footprint is uneven, a pattern not dissimilar to that of some break-out countries with high digital momentum in our analysis. China scores poorly on foundational factors, primarily due to its low data accessibility score and restrictive internet regime. As noted in our *Ease of Doing Digital Business 2019* report,[101] a combination of stringent data localization laws, a general climate of data opacity, and censorship make China effectively the world's biggest "intranet economy."

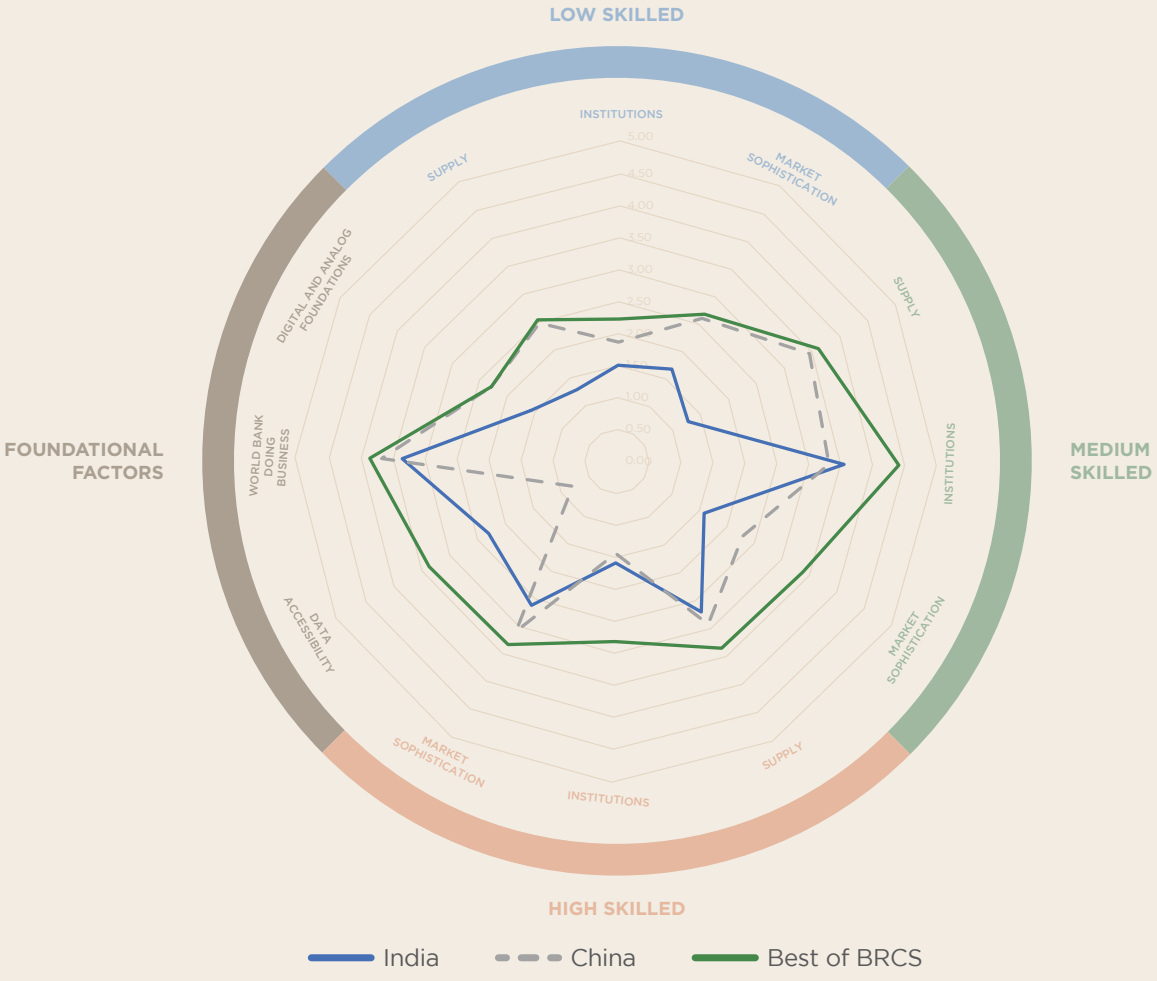
While its digital protectionism and restrictions are far from benchmark-worthy, China's track record in creating millions of jobs for low-skilled workers on the back of the growth of e-commerce platforms and their corollaries—which increased from $120.8 billion in trade volume in 2004 to nearly $4.44 trillion in 2017[102]—merits emulation. Of the 43 metrics that comprise our low-, medium-, and high-skilled digital jobs scores, China scores the highest on at least half among the BRICS.

In dealing with the challenge of digitalizing kirana (mom-and-pop) shops in rural areas, Tier 3 and Tier 4 cities, and towns, India would do well to look to China—where, as in India, the urban–rural divide is quite stark. In China, 600 million people live in rural areas,[103] with an average of under $2,300 per capita in disposable income among rural Chinese, 40% less than what urban Chinese had in 2018.[104] The country's experience in bringing mom-and-pop stores into the e-commerce fold, extending digital technologies to the informal sector, and creating jobs can serve as a model for India, demonstrating how, as Victoria Kwakwa, World Bank Vice President for East Asia and the Pacific, observed, "developing countries can harness digital technology and e-commerce to create jobs and improve people's lives."[105]

Launched in 2014, a joint effort among the Alibaba Group, the Ministry of Finance, and the Ministry of Commerce in China piloted two village-based collaborative programs, the Rural Taobao initiative and the Rural e-Commerce Demonstration Program, aimed at alleviating poverty and bringing inclusive growth to rural areas. Since then, online purchases from Alibaba platforms in poverty-stricken counties nationally grew from $10.9 billion to $30.9 billion, with more than 200,000 express mail shipping routes built from these poor counties to cities to meet the supply chain needs.[106]

Looking ahead, China will likely continue to lead the way in terms of technologies deployed, skills leveraged, processes applied, and the range of products and services delivered by e-commerce platforms and their corollaries, fostering the critical elements for employment generation in logistics, in fulfillment, and across supply chains. For all of these reasons, China is a helpful reference point for India on how to use digital technologies to jumpstart job creation, particularly for low-skilled workers.

EXHIBIT 3: ANALYSIS | INDIA VERSUS THE BEST OF BRCS



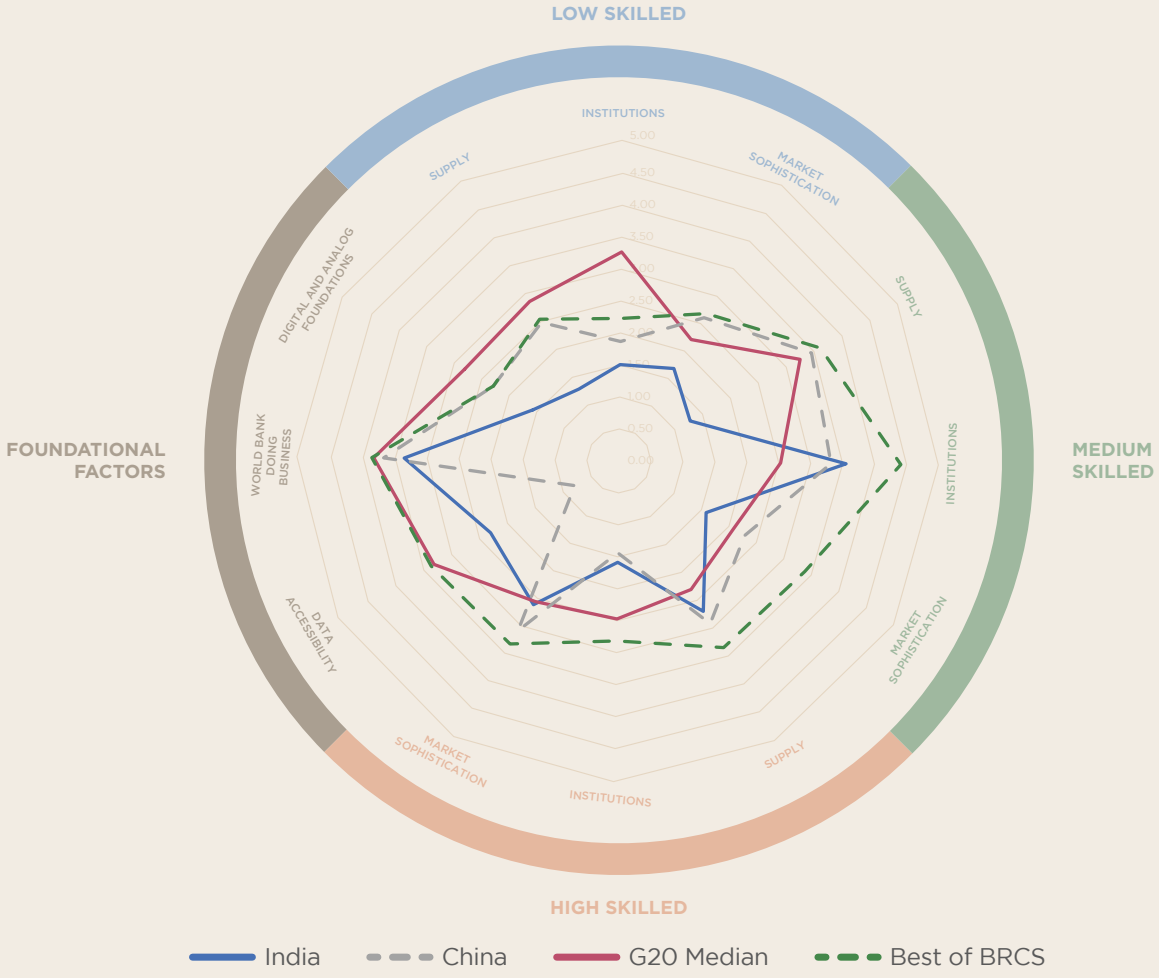
Best of BRCS: Drawing Inspiration from India's Upper-Middle-Income Economic Peers

Collectively, the best of BRCS benchmark—the mythical nation we fashioned by stitching together the best attributes, i.e., the highest scores across all metrics' of Brazil, China, Russia, and South Africa—represents a sophisticated and aspirational market with a relatively even footprint on our scorecard, except perhaps on some foundational and institutional attributes.

South Africa is a model for creating medium- to high-skilled digital jobs, with a promising growth trajectory, thanks to its flexible data transfer policies,[107] citizens' optimistic economic outlook,[108] and relatively large English-proficient population.[109] Because of the deeply rooted sharing culture on the subcontinent, South Africa embraced the international ride-sharing and home-sharing platforms when Uber and Airbnb entered the market. Airbnb alone witnessed a 95% rise in the number of house listings in the country, generating $186 million worth of economic activity in 2016.[110] Similarly, the ride-sharing platform Uber has created more than 2,000 jobs in the country.[111] Despite the economic benefits generated by allowing international companies to grow in South Africa, fast-growing domestic startups have also been in the race to spur economic growth, create job opportunities, and pilot innovative ideas. For example, the local home-sharing platform Afristay has about 20,000 listings across 2,000 locations in South Africa, whereas Airbnb has only 35,000 listings in the country.[112] Startups like Hello Doctor and Medici have been using technology to connect more than 400,000 patients in South Africa with health professionals.[113]

Russia and Brazil offer lessons in high-skill job creation. Russia scores the best in consumer sophistication and educational attainment in creating high-skilled digital jobs. Despite its low 1.3% economic growth in 2019,[114] Russia's per capita income is roughly one-third higher than China's,[115] and the share of adults with tertiary education in Russia is four times as high as the rate in China and two times as high as in Brazil.[116] Russia's ambitious Project 5-100,[117] competing to become a higher-education global research hub, has demonstrated the country's efforts to invest in human capital. On the other hand, Brazil, branded as the "social media capital of the world," has the second-largest user base on Instagram, with 50 million monthly active users,[118] and the percentage of Brazilians who pay for online news was recently at 22%, fourth highest among the 37 countries analyzed.[119] Brazil scores the highest in digital media usage and internet users' willingness to pay for subscription content. Furthermore, Brazil's efforts to increase flexibility in hiring procedures and reduce costs and uncertainty for labor disputes bode well for attaining the level of ease needed for hiring talent in the digital world.[120]

EXHIBIT 4: ANALYSIS | INDIA VERSUS G20 MEDIAN



The G20 Median: A Virtuous Cycle of Strong Institutions and Dividends from Investments in Education and Upskilling

The G20 median—the mythical nation we created by combining the median scores among the G20 members across all indicators and disaggregated measures on our scorecard—represents, in our analysis, the true North Star for India. The defining characteristics of such a G20 median benchmark are strong institutions and high levels of education.

Education and good governance are not just worthwhile goals to achieve on their own; they also create a virtuous cycle,[121] setting the stage for inclusive economic growth and job creation.[122] In India, only 9% of the adult population has an advanced education, compared to the G20 median's 29%,[123] and only around 2% of the population is enrolled in upper secondary vocational programs, compared to the G20 median's 23%.[124] Investments in education and skill building are the sine qua non of medium- and high-skilled job growth and the realization of India's trillion-dollar digital dream.

Getting to the G20 median requires India's institutions to work assiduously to bridge the gaps between the aspirational benchmark and actual policies and their execution. One of the biggest and most worrisome of such gaps is the state of data accessibility. Our *Ease of Doing Digital Business 2019* analysis shows India mirroring China on aspects of data protectionism and localization. As we noted in that report, "Data localization laws and rules that raise barriers to data accessibility are not just a risk to one of the primary engines of global growth; they also hurt the competitiveness of the country in question. These barriers have the effect of imposing a regressive tax on digital businesses in the country: they raise the costs of entry and of doing digital business, especially for startups and SMEs, encourage rent-seeking behavior among established domestic actors, and reduce competition."[125] Moreover, for a country like India that has an abundance of tertiary-educated freelance talent seeking employment opportunities, these data localization requirements pose a barrier to participation on global freelance platforms.[126]

Perhaps most important, India's data accessibility norms matter not just to its 1.35 billion citizens;[127] they have a significant impact on the entire liberal democratic world order that thrives on open and inclusive internet economies. For all these reasons, India would do well to aim for the G20 median on all disaggregated measures.

Getting to the G20 Median: What Needs to Change?

To demonstrate the policy relevance and actionability of our data-driven benchmarking analysis tool, we conducted a set of diagnostics as detailed in the following section. It is important to keep in mind that the model, as constructed, provides several potential policy combinations. This is a feature, not a bug. While we recommend in this report a particular course of action and a specific combination of policy levers that India needs to toggle simultaneously—while holding others constant—to close the gaps with the G20 median, the model was built to engage policymakers and decision-makers in a workshop setting to explore a few potential policy action scenarios and encourage dialogue.

Identifying and Quantifying Gaps

To quantify the policy levers that decision-makers can toggle to help India close the gap with the G20 median benchmark, we delve into a cluster- and indicator-level analysis.[128] Each skill level in our model consists of three key components, Supply, Institutions, and Market Sophistication, where Supply measures a country's capacity to supply to the given vertical market and its corollaries when creating digital jobs, Institutions assesses a country's institutional environment, and Market Sophistication contains factors such as education level, skills development, demographics, and consumer preferences and behavior. Each key component has several clusters, and each cluster consists of indicators and sub-clusters.

Take the ease of creating low-skilled digital jobs as an example. This section illustrates how we identified and quantified the gaps between India and the G20 median benchmark. Table 2 shows the chain of calculation when assigning a 0–5 score at each level for the ease of creating low-skilled digital jobs for the Supply component.

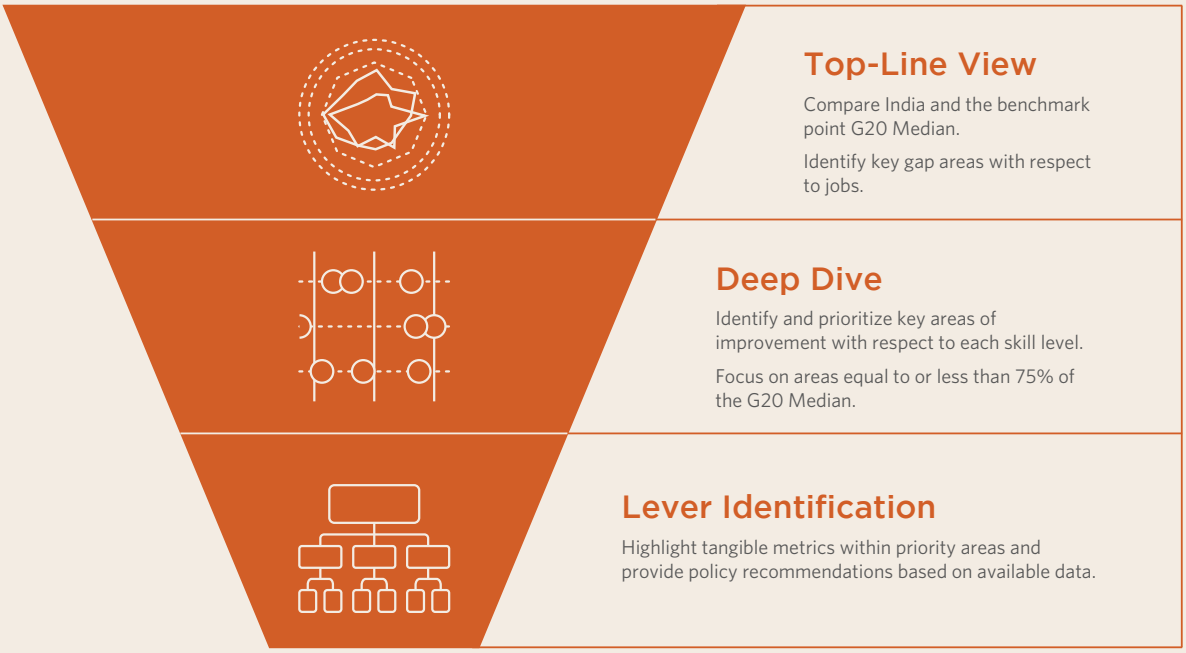
TABLE 2: UNDERLYING FRAMEWORK

Question Answered	Indicator	Cluster	Component	Proxy
What is the quality of trade and transport infrastructure?	World Bank LPI	Fulfillment	Supply	Ease of Creating Low-Skilled Digital Jobs
What is the quality of logistics services?	World Bank LPI			
Are there tracking and tracing systems in place?	World Bank LPI			
Do shipments reach destinations on time?	World Bank LPI			
What is the level of high-quality bandwidth access?	ITU	Connectivity		
Do people have some sort of financial account, mobile money account, or other account?	World Bank: Global Findex Database	Transaction		

As Exhibit 6 shows, India lags the most on the ease of creating low-skilled digital jobs. We start with reverse engineering from the component level; if the component at the skill level underperforms, we delve into the clusters that form the component. In this case, we look at fulfillment, connectivity, and transaction in India, compared to the G20 median benchmark. As illustrated in Exhibit 6, India performs at 47%, 59%, and 35% of the G20 median on those metrics, suggesting that it has a 53%, 41%, and 65% gap to close to reach to the benchmark. We then move to the indicator level to see how much India needs to improve to close those gaps. For example, the cluster "fulfillment" consists of five indicators, and India needs to improve on those five metrics simultaneously to be on par with the benchmark.

Our approach is diagrammed in Exhibit 5.

EXHIBIT 5: OUR APPROACH



To Improve Digital Foundations

As mentioned, the foundational factors serve as the basis for the digital economy, including measures such as digital infrastructure, data regulations, and public policy choices concerning data privacy and many other areas that are critical for conducting any activities, let alone job creation, in the digital realm. On the foundational factors front, improving India's World Bank *Doing Business* 2019 Distance to Frontier (DTF) score by 14%, digital and analog foundations by 79%, and data accessibility by 44% would help the country reach parity with the G20. This could potentially be accomplished by improving regulations to foster a more business-friendly environment; improving specific e-commerce policies, such as enhancing fulfillment and cross-border trade efficiency; improving and expanding connectivity; increasing digital money payments; and relaxing onerous data localization requirements. For the past three years, India has found itself among the top 10 improvers on the *Doing Business* metric, and continued advancements in this area will be key to reaching parity with the G20 median.[129]

To Improve Ease of Creating Low-Skilled Digital Economy Jobs

The benchmarking exercise reveals that India is falling significantly short of the G20 median regarding ease of creating low-skilled digital jobs. Given the sizeable youthful labor force, the fast-evolving e-commerce sector in India,[130] and foreign capital flows in the past two years,[131] we believe that this is the area where India has the potential to make the most impact, creating vast job opportunities in logistics, fulfillment, and delivery.

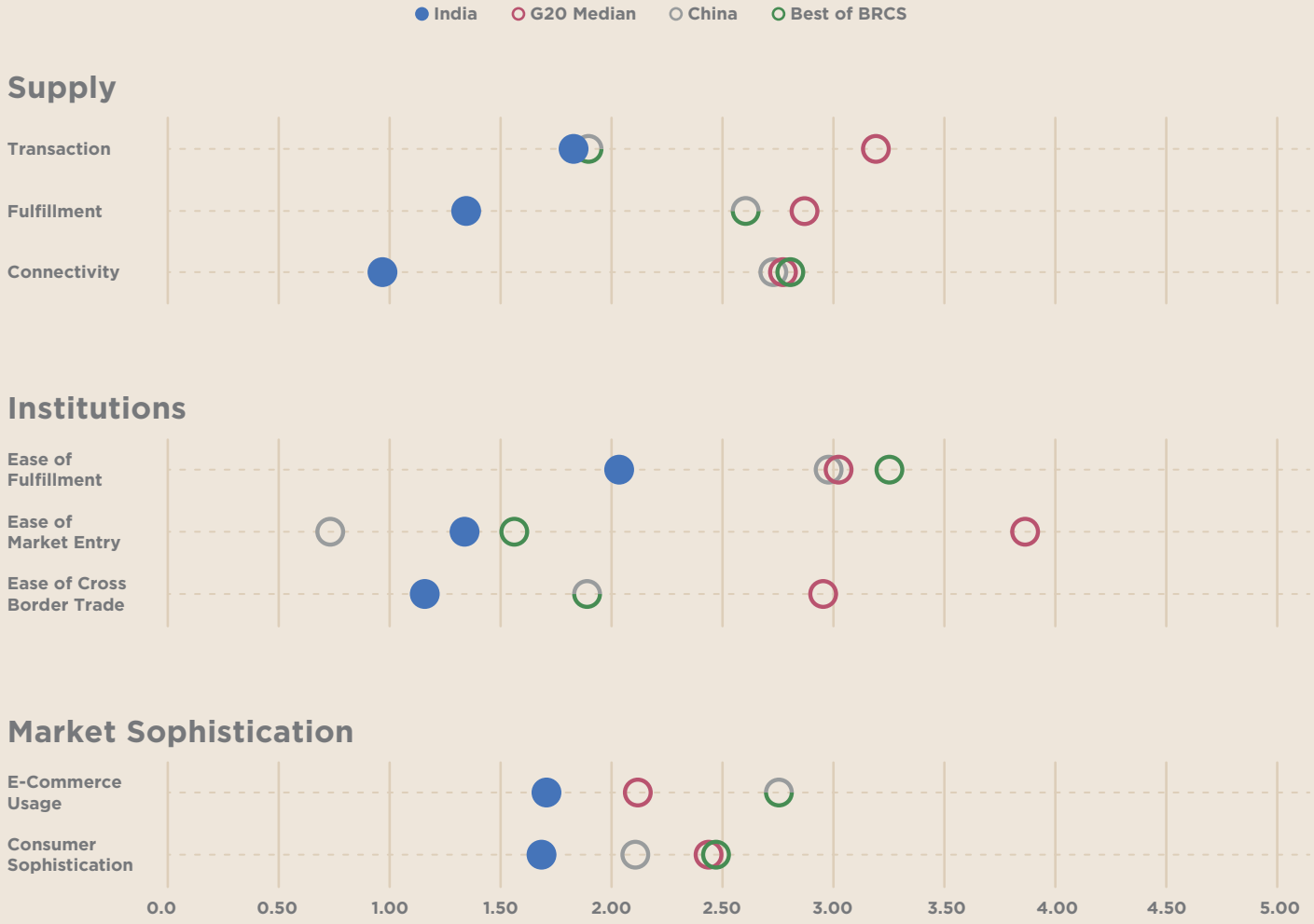
To reach the G20 median, increasing e-commerce usage and market sophistication will be necessary, but this is more of a long-term goal, as upskilling a vast labor force and improving a nation's quality of education takes time. However, several indicators from the Supply and Institutions components are crucial to improving the ease of creating low-skilled digital jobs in the medium and near term.

- Within the Supply component, the cluster's key focus areas are transaction, connectivity, and fulfillment, as presented in Exhibit 6. One of the defining indicators is the provision of at least 3G services to cover all of the population. An improvement of just 6% with respect to this indicator could propel India to meet the G20 median within this cluster, as our data suggest that 94% of Indians versus 99.4% for the G20 median are currently covered by 3G mobile or better. Expanding high-speed mobile internet coverage in rural areas can help India address the "last-mile" problem. Moreover, increasing the 4G network's speed would improve the vast number of mobile users' online experience, as the 4G connection speed averages 6.8 Mbps in India, compared to the G20 median's 23.2 Mbps in 2019.[132]
- The fulfillment cluster comprises indicators that measure the quality of trade and transport infrastructure, the quality of logistics services, the efficiency of tracking and tracing goods, and delivery timelines. Based on our analysis, improving those indicators by 29%, 18%, 12%, and 13%, respectively, can push India to meet the G20 median within this cluster.
- Access to e-payment platforms is the main indicator for measuring India's performance in the transaction cluster. India can close the gap with the G20 median if the country increases access to e-payment platforms by 17%. Notably, 80% of Indians, versus 94% of G20 median citizens, had a bank account in 2018.

Analysis of India's Institutions component consists of the following key clusters: ease of cross-border trade, ease of fulfillment, and ease of market entry, which examines the extent to which the regulatory environment, agencies, and policies are efficient and accountable.

- India lags in the ease of getting property, permits, and protection, compared to the G20 median within the ease of fulfillment cluster. In this area, India—despite recent progress[133]—still has a way to go to reach the G20 median. An improvement of 75% on the indicator that addresses the ease of gaining permits and registering property will enable the country to close the gap.
- The ease of cross-border trade cluster has two key indicators: the time and cost to import/export goods and the efficiency of customs procedures. A 19% reduction and a 14% improvement for the two indicators, respectively, could put India on course to meet the G20 median benchmark.
- The ease of market entry consists of three key indicators. A reduction of 40% in the market entry barriers to FDI in infrastructure, an improvement of 13% on the indicator for FDI regulations, and improvement of 43% in market competition in the e-retail sector will help India close the gaps.

EXHIBIT 6: DEEP DIVE | LOW-SKILLED DIGITAL JOBS



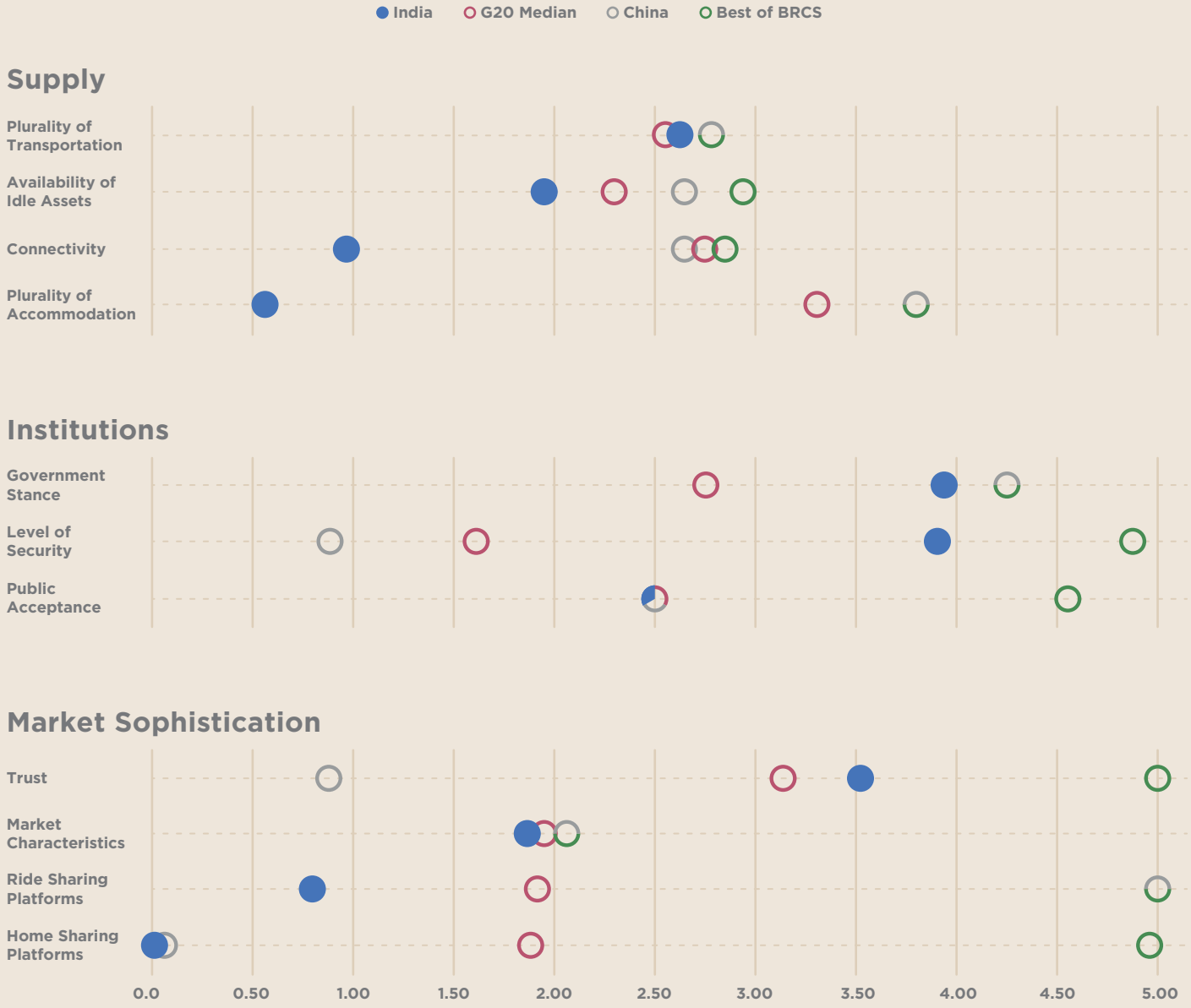
To Improve Ease of Creating Medium-Skilled Digital Economy Jobs

Turning to the ease of creating medium-skilled digital jobs, India is doing particularly well on the regulatory front and in the government's stance on the sharing economy, compared to the G20 median benchmark, as the "Institutions" panel in Exhibit 7 shows. Our public-acceptance cluster suggests that India has a welcoming environment for the sharing economy and fewer protests in response to the rise of the ride-sharing industry. We will therefore not focus on providing policy recommendations on the Institutions front, as our priority is to identify the areas where India can improve compared to the G20 median benchmark.

We recognize that the sharing economy has been negatively impacted by COVID-19. While it will likely evolve and recover once the pandemic window closes, for the purposes of this analysis, the sharing-economy sector is used as a proxy for medium-skilled jobs over the long term.

- Within the Supply component, improvements in connectivity are necessary—a consistent recommendation across all three job-skill levels. The plurality of accommodation is an area where India could improve significantly. Within Market Sophistication, India's lack of home-sharing listings and low use of ride-sharing drives this score down. Of note, improving the capacity of hotel or home-sharing platforms to attract travelers and better accommodate visitors' needs by 22% could push India toward parity.
- As in relation to low-skilled digital jobs, India could benefit from closing the gaps on the Market Sophistication front: an improvement of 30% in the development, growth, and adoption of ride-sharing platforms can help India reach the G20 median level.

EXHIBIT 7: DEEP DIVE | MEDIUM-SKILLED DIGITAL JOBS

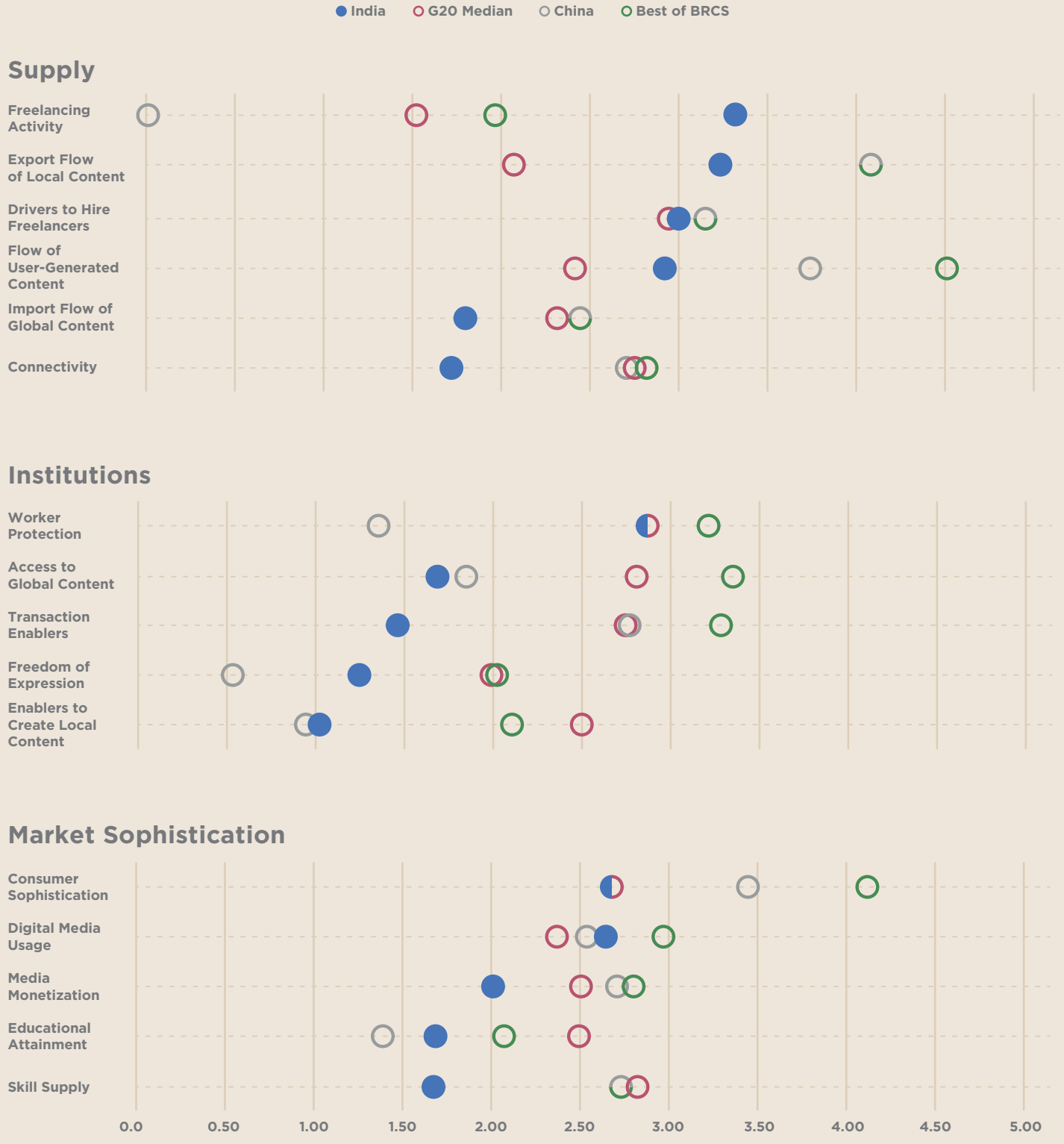


To Improve Ease of Creating High-Skilled Digital Economy Jobs

Due to growing technology and a fertile startup environment, coupled with world-class engineering colleges and a prevalence of freelancing activities, India performs well on the ease of creating high-skilled digital jobs. As Exhibit 8 shows, India is only falling short on the Institutions front. This suggests several viable policy recommendations:

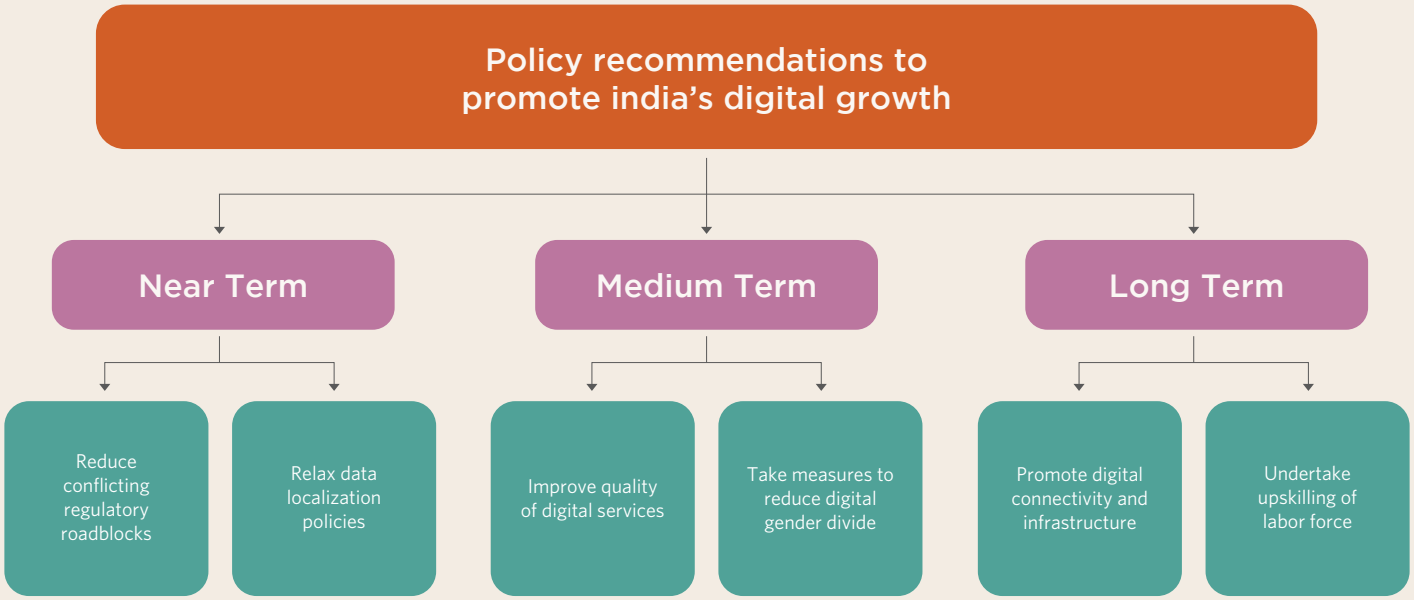
- Within the transaction-enablers cluster, improving cross-border digital payments by 50%, reducing the average time spent on filing taxes by 39%, and promoting cross-border e-invoicing for electronic payments and digital trade will help ease blockages for online freelance activity and enable India to close the gap with the G20 median.
- Increasing freedom of expression, improving institutional support for local content through investment in public broadcasting, and refraining from blocking content by 6% will increase internet users' access to a wider range of information sources and help them stay informed.

EXHIBIT 8: DEEP DIVE | HIGH-SKILLED DIGITAL JOBS



Takeaways: Insights and Implications for Action

EXHIBIT 9: RECOMMENDED POLICY TREE



Near Term

The Indian government can evaluate existing policies and practices to reduce conflicting regulatory roadblocks for the growth of the digital economy.

The Indian government has envisioned the achievement of a trillion-dollar digital economy, as detailed in a report published in February 2019, prepared in consultation with the Government of India, various state governments, and private stakeholders, which outlines nine national goals and 30 digital themes that cover the extent of digital adoption in India, the potential size and drivers of the Indian digital economy, and a roadmap for achieving India's digital vision.[134] However, in the report, the government offers no regulations specific to data centers, leaving them covered by telecom-centric guidelines for "other service providers." Also, there is no

clear direction about whether data centers need an internet service provider license to connect directly to the internet.

- The Ministry of Communication could create a regulatory category specifically for data centers, clearing ambiguity and freeing such operations from rules for "other service providers."
- Public officials should consider refreshing the IT Act, which was last amended in 2008, so that it addresses the following: (1) ubiquitous coverage and applicability that covers the spectrum of personal data and applies to all data-gathering organizations; (2) strong enforcement of data protection laws through a central body; (3) the right to recourse and the right to seek compensation, which are crucial for personal data providers but not currently included in Indian law; (4) provisions that address confidentiality, privacy, and governance framework in relation to cloud computing issues.

Improve data accessibility and relax data localization policies.

The *Ease of Doing Digital Business* report points out that "of the 2.78 billion internet users covered in the [report] (78% of internet users worldwide), 54% score less than [the median level] on data accessibility, led primarily by China, which practices the most aggressive form of digital protectionism and 'views data as an issue of sovereignty, and trade in data as a national-security matter.'"[135] India, as our benchmark analysis shows, scores poorly on this metric as well, given the recent spate of laws and regulations in the country mandating stringent data localization requirements.

- Relaxing data localization laws could help many digital platforms, such as e-commerce, artificial intelligence research and applications, and media companies, unlock economic value and reach their employment potential. For example, India had eased foreign-direct-investment laws and replaced complicated taxes with a nationwide levy on goods and services in 2014, when Prime Minister Modi was elected.[136] However, the data localization policy included in the 2019 Draft National e-Commerce Policy, which calls for "all personal data determined to be critical to be processed locally,"[137] could be a potential roadblock for achieving long-term sustainable growth in the e-commerce sector, especially for creating job potential in the fulfillment and logistics sector.

Continue making progress in the World Bank *Doing Business* ranking.

India has made tremendous progress in the World Bank's *Doing Business* rankings in the last decade, moving from 133rd place among 183 economies in the 2010 report[138] to 63rd place among 190 economies in 2020.[139] As the level of ease of creating digital jobs is closely correlated with broader support for the ease of doing business in the physical world,[140] continuing to improve in the metrics measured in the *Doing Business* index, such as simplifying the process of obtaining property registration and business permits, reducing red tape associated with starting a digital business, facilitating cross-border trade, and establishing more comprehensive anti-monopoly measures, could help India reach the global median and add jobs in the digital realm.

Medium Term

In the medium term, India should focus on improving its quality of digital services, connectivity, and inclusion, with particular attention to closing gender and urban–rural gaps.

- India's Ministry of Micro, Small & Medium Enterprises and Ministry of Finance could develop a digitally verifiable GSTN-Udyog-Aadhaar identity as a one-stop corporate KYC solution. This effort could include educating smaller businesses about the benefits of GSTN to encourage adoption, especially in rural and hard-to-reach areas. According to data provided by India's Ministry of Micro, Small & Medium Enterprises, almost 51% of Indian MSMEs are based in rural areas.[141] Scaling up this approach using the model of digitally enabled KYC for individuals could enable significantly easier verification and authorization for banks in their dealings with MSMEs and reduce the cost to serve them.

- Additionally, providing and promoting digital job opportunities for women is a critical area. India had a 7% unemployment rate as of February 2020, but the rate is as high as 18% among women.[142] According to an estimate by Bain & Company and Google, "400 million jobs will be needed for women alone in the coming years."[143] The increase in high-skilled digital jobs, such as freelancing, could have a disproportionately positive effect on women. After having children, many women find it hard to go back to work full time. An increase in the digital economy will lead to an increase in freelance opportunities, and educated women will be able to take jobs that fit into their schedule and that can be balanced with home obligations. The potential for future digital jobs to be more synchronous with Indian life, and to offer more flexibility in hours, indicates that growth of India's digital economy could lead to increased employment and economic freedom for women.

Develop connectivity and digital infrastructure.

Our analysis shows that, compared to other benchmarks, connectivity is an area where India is falling behind but has the potential to improve quickly. This is one of the most fundamental elements for India in the creation of more digital jobs and the country's progress toward the goal of becoming a trillion-dollar economy—not to mention that in times of crisis or sudden change, like the current COVID-19 pandemic, strong digital infrastructure increases resilience. The 2020 Union Budget pledged $2 billion for quantum computing, data center policy, IPR portal development, and providing digital connectivity to all public institutions at gram panchayat level,[144] highlighting the critical role that technology-enabled innovation and development plays in addressing the challenges and opportunities of the digital revolution process. There is potential here to solve the last-mile connectivity issue and positively impact the livelihood of millions.

This level of commitment will require a huge capital outlay from both the public and private sector. Some recommended actionable items to consider are:

- Creating sound public policies and forming public–private partnerships to provide support for infrastructure development and investment, targeting the quality of fulfillment on the ground and the ease of making digital transactions in the next five to 10 years.
- Introducing quality certification of internet providers to ratify telecom and cable operators on technical parameters. This would allow for multiple players to provide quality service to consumers in a fair, competitive market.

Long Term

The Indian government should focus on upskilling its labor force and the quality of education.

As we see from the Market Sophistication component across job-skill level, India still suffers from a low-quality labor force and idle seasonable employment patterns because of the large agricultural sector. A 2018 Ministry of Commerce and Industry and PwC task force found that 55% of those surveyed were looking for high-tech AI talent, but only 17% were able to find desired candidates.[145] Contrast this reported shortage of highly skilled workers with the finding of a recent Ernst & Young study: 5.5 million jobs are created each year, but there are 17 million new entrants into the Indian workforce annually.[146] Clearly there is a skills mismatch. The trillion-dollar digital economy blueprint aims to achieve "universal digital literacy." In pursuing this goal, India's government needs to:

- Pivot the focus to include upskilling more rural and less-educated communities as well as the educated populations. If one looks at the pyramid of educated people in India, the

top section is narrow and the skills of those in the next layer are weak. For example, a very small percentage of engineering graduates are performing at the level that their future managers and organizations are coming to demand. As a 2019 Brookings Institution report notes, only 10% to 40% of engineering graduates are employable, depending on the role, with employability across disciplines at 45%.[147] Despite the fact that the number of higher-education institutions (HEIs) and enrollment has increased four-fold compared to 2001 levels, low employability of graduates, poor quality of teaching, weak governance, insufficient funding, and complex regulatory norms continue to hinder the development and upskilling of India's educated labor force.

- Build a regulator for tracking and updating upskilling agencies—one of whose responsibilities will be to build a National Information Utility in partnership with the private and non-government sector. The National Skill Development Corporation could help by clearly defining the roles and responsibilities of skill councils. The Indian government needs to consider policies that can best mobilize the large young urban groups with access to mobile phones and the internet to actively contribute to India's trillion-dollar digital economy.

The COVID-19 pandemic of 2020 shines a bright light on necessary areas for improvement across all countries and societies. It also serves as a reminder that those countries struggling with major inequalities nearly always face greater challenges when working through national crises.

While there is little question that countries with a strong digital workforce and solid internet infrastructure have an economic advantage over those lacking in these areas, there is also a clear need for inclusivity in government policies and approaches. Moving away from declarative governance and streamlining policies to work toward a coherent digital vision, improving skills and education, investing in digital infrastructure, maintaining data privacy while expanding data accessibility, and closing the urban–rural and gender gaps will all serve to make India a more resilient and inclusive country. At the moment, India's "trillion-dollar opportunity"[148] is just that: an opportunity. Transforming that opportunity into a promise fulfilled will require more execution and less declaration.

The need to accelerate this transition toward execution and the realization of that opportunity could not be more acute, as the COVID-19 outbreak has devastated so many lives and livelihoods. The Indian economy was already in a jobs and economic crisis before the pandemic began. Now the stakes are even higher. It is our hope that the benchmarking exercise and policy proposals outlined here offer some light at the end of the tunnel, given the momentum that India has experienced already in building its digital economy.

Methodology

Model Structure

This research initiative is a benchmarking exercise inspired by the *Ease of Doing Digital Business 2019* (EDDB) report, which measures the ease of doing digital business across 42 countries, four essential digital platforms—e-commerce, digital media, the sharing economy, and freelance—and three foundational factors. We use the foundational factors and four EDDB platform scores as a proxy to assess a country's ease of creating digital jobs. Keeping the foundational factors as they are, we used e-commerce, the sharing economy, and a combination of freelance and digital media as a proxy for the ease of creating low-skilled, medium-skilled, and high-skilled digital jobs, respectively. (See Table 3 for an overview of this framework.) In this research, we do a "deep dive" on India. We consider to what extent India is ready for creating

- high-skilled digital jobs, such as freelance work and those in media;
- medium-skilled digital jobs, such as those in ride-sharing service; and
- low-skilled digital jobs, such as those in the e-commerce sector,

evaluated against two constructed benchmarks and China to identify strengths to build upon and opportunities to close gaps.

Following the EDDB model structure, to determine scores, the component scores within each pillar or driver are calculated using a weighted-average formula; clusters with lower weights have less impact on the overall mean of the pillar or driver. The component scores are then averaged together to make up the final pillar or driver score. An arithmetic weighted average of the components provides us with the most accurate score and ensures that the pillar or driver mean values reflect the way that the components are weighted in the index. Indicators drawn from a variety of sources are set on a five-point scale for comparability to arrive at a high score and a low score. Data scaling is executed by multiplying the data point of a given country by a scale factor.

The scale factor is calculated by finding the ratio of the difference between the data point and the minimum-value data point in the set to the overall range of the data. This ratio is then multiplied by a factor of 5. In this way, the maximum determined data point in a set will have an index value of 5, while the minimum value in the data set will have an index value of 0. The scaling formula we deployed is as follows:

Scaled Value = 5*(data value – minimum)/(maximum – minimum)

The maximum-value data point in the set is determined by examining the maximum-value data point in a given set, excluding any extreme outliers. If there is an extreme outlier in the data set, a maximum value is set as the next highest data-point value, and the outlier is given the maximum possible score of 5.

Data Selection, Weightings, and Computation

Data Selection: We sourced data from a combination of public, proprietary, and subscription data sets. Public data sets include many data points from sources such as the World Bank, the World Economic Forum, and the UN. Proprietary sources include data from our partners, such as PCRI, Chartbeat, and Akamai. Subscriber data sets include those from GSMA Intelligence and Euromonitor Passport. Where no secondary data sources were available—for example, on the number of ride-share protests over the last five years across countries—we collected and coded data manually.

Weightings: Ease of creating digital jobs by skill level is weighted based on the jobs' importance relative to the overall digital economy and their projected importance going forward.

TABLE 3: FOUNDATIONAL FACTORS

Foundational Factors (50% of total score)	Weights	Description
Data Accessibility	25%	The extent to which data easily moves across and within borders, including the intensity of data flows and data restrictions. This is a measure of the free flow of data as well as government openness to sharing anonymized data publicly, and policies in place to safeguard user privacy.
Digital and Analog Foundation	15%	Indicators descriptive of foundations—i.e., the Demand, Supply, Institutions, and Innovation conditions—essential for all digital platforms.
World Bank Doing Business	10%	Doing Business Distance to Frontier measure for 2019, representing how far a country performs compared to the best possible.

DIGITAL JOBS SKILL LEVELS

Skill Levels (50% of total score)	Weights	Description
Low-Skilled Jobs	20%	For example, factory workers, delivery drivers, and other kinds of online retail support.
Medium-Skilled Jobs	15%	For example, asset-sharing jobs like drivers, hosts, guides, etc.
High-Skilled Jobs	15%	For example, professional freelancers, such as graphic designers, accountants, consultants, lawyers, etc. Not to be confused with high-tech jobs, which includes highly technical jobs such as AI software developers, machine learning engineers, etc.

Indicators are given weights depending on the following factors:

Data quality: Indicators that required more estimations, owing to patchy coverage across countries or years or both, were weighted lower than those with fewer estimations.

The strength of the data collection methods: Since we use secondary data, we evaluated the data-gathering processes deployed by the sources of said data. We assigned greater weights to indicators that had robust processes of data collection. In the same vein, we assigned greater weights to observational data than to survey data.

Centrality: The importance of the indicator within its component/cluster/sub-cluster. Foundational measures, on which many other measures are dependent, were given greater weights than those that had fewer multiplicative effects.

In our model, the indicators are weighted first using a robust process to minimize correlations and covariance within sub-clusters, clusters, and components. After consideration for these effects, the weightings are then determined based on rigorous social-science reasoning. Where possible, we tested for interaction effects to ensure that we were capturing the correct measures and in the right ratios. We also subjected our weighting approach to a range of stress tests to minimize conceptual biases.

Constructing the Benchmark

The two constructed benchmarks are the "G20 median" and the "best of BRCS." The G20 median benchmark provides a comparison point as an international standard, representing most of the world's economic activity, and India is also a part of the G20. The best of BRCS is an ambitious benchmark, as it consists of the best performance scores among Brazil, Russia, China, and South Africa. Lastly, the China–India comparison provides interesting insights into the ease of creating digital jobs between the top two largest countries, by population, in Asia.

G20 median is constructed using the median point at the indicator level among G20 median countries (not including Saudi Arabia, Bulgaria, Croatia, Cyprus, Latvia, Lithuania, Malta, Romania, Slovakia, and Slovenia). The best of BRCS is composed of the highest points among Brazil, Russia, China, and South Africa at the indicator level.

For a given indicator *i*, the benchmark's score was:

G20 Median = Median {G20 members, excluding Saudi Arabia, Bulgaria, Croatia, Cyprus, Latvia, Lithuania, Malta, Romania, Slovakia, Slovenia}

Best of BRCS = Max {Brazil, Russia, China, South Africa}

Limitations and Future Endeavors

This benchmarking model is designed to serve as a diagnostic to highlight areas of strength and weakness and to motivate a conversation with policymakers on prioritizing the gaps that need to be closed in the process of advancing India's digital economy.

While we made every effort to gather the most recent and best available data across the many parameters to measure the current state of India and the rest of the 41 markets, the data and the model are indicative of neither past trajectory nor future direction. Further, given our reliance entirely on secondary data sources that are, for the most part, lag indicators, there may be shortcomings in our assessment of the current states of the countries analyzed. Built as an outside-in assessment, the model is blind to any initiatives and efforts that are currently under way in these countries.

Employment data in the real world are sticky and affected by a variety of macroeconomic and microeconomic factors. Despite our best efforts to be comprehensive, owing to data and model limitations, one might still find discrepancies between real-world data and the outcomes of our analysis. In our future endeavors, we hope to develop partner relationships with industry leaders, think tanks, and businesses to gain insights, analysis, and policy recommendations. We would also like to conduct an economic value analysis of how much value India could unlock based on the policy recommendations. In addition, we hope to delve deeper into a range of issues, such as the rural–urban socioeconomic discrepancy, gender inequality, and pathways to building smart cities in India to help the government, business leaders, and policymakers design informed and effective policies.

We recognize, in all humility, that there are many facets to and outcomes of this analysis writ large that we haven't recorded, as well as many others that the world has yet to discover. We invite you to let us know what other aspects we should measure and consider as we build on this work.

Appendix

Glossary

Benchmark Terms

G20 median: a constructed benchmark point using the median point at the indicator level among G20 median countries (not including Saudi Arabia, Bulgaria, Croatia, Cyprus, Latvia, Lithuania, Malta, Romania, Slovakia, and Slovenia).

The best of BRCS: a constructed benchmark composed of the highest points among Brazil, Russia, China, and South Africa at the indicator level. This is derived from the familiar BRICS grouping of countries, with the exception that India is removed from the group.

Ease of creating low-skilled digital jobs: the extent to which India is ready for creating low-skilled digital jobs like those in the e-commerce sector, such as factory workers, delivery drivers, and other kinds of online retail support.

Ease of creating medium-skilled digital jobs: the extent to which India is ready for creating medium-skilled digital jobs like those in ride-sharing and asset-sharing service, such as drivers, hosts, and guides.

Ease of creating high-skilled digital jobs: the extent to which India is ready for creating high-skilled digital jobs like those in professional freelance, such as graphic designers, accountants, consultants, and lawyers. Not to be confused with high-tech jobs, a category that includes highly technical jobs such as AI software developers and machine-learning engineers.

Common terms across skill levels

Supply: category measuring a country's capacity to supply to the given vertical market. Factors measuring access, transaction, and fulfillment infrastructure necessary for creating digital jobs.

Connectivity: the extent to which people are covered by high-speed communication networks.

Market sophistication: category containing factors that assess how attractive the market is to new entrants. Factors include education level, skills development, demographics, and consumer preferences and behavior.

Consumer sophistication: the extent to which the consumer base is willing and able to consume digital media.

Institutions: category that assesses a country's institutional environment around a given vertical.

Digital protectionism: obstacles that hinder the flow of digital business and trade. Includes data localization and procurement policies intended to promote digital trust, security, and privacy.

Platform economy: encompasses all economic activity that takes place via online platforms. The platform economy acts as the overall superset of the four verticals. Examples specific to each vertical include Amazon as a platform for e-commerce, Netflix as a platform for streaming digital media, Uber as a platform for ride-sharing in the sharing economy, and Upwork as a platform for online freelance.

Low-skilled digital jobs

Fulfillment: the process of completing an online order. Encompasses the reception, packaging, shipping, and delivery of customer orders.

Transaction: the extent and quality of financial transaction means within a country.

Ease of fulfillment: the extent to which consumers and businesses can reliably and affordably order and deliver goods.

Ease of cross-border trade: the extent to which consumers and businesses can reliably and affordably order and deliver goods across borders.

Ease of market entry: the extent to which businesses can bring a product or service to a specific market.

E-commerce usage: the extent to which people participate in e-commerce.

Medium-skilled digital jobs

Sharing economy: also called the "physical gig economy"; the sector of the gig economy in which the service provided takes place in the same location as the client. The organization of labor may still take place on online platforms. Common job examples include Uber and Lyft drivers, Airbnb hosts, and DoorDash food-delivery providers. In *Ease of Doing Digital Business*, the sharing-economy vertical encompasses the physical gig economy.

Ride-sharing: a sector of the physical gig economy in which the user of the service can share their location with a driver and request transportation services in real time via a mobile app. Unlike taxi drivers, drivers in the ride-sharing industry only need a standard driver's license and their own car to provide ride-sharing services. Examples of ride-sharing companies are Uber and Lyft.

Home-sharing: a sector of the physical gig economy in which property owners can rent out their property to those looking for a place to stay for a period of time. Property can range in size and location from an extra bedroom in one's apartment to a house with a private beach.

High-skilled digital jobs

Online freelance: a subset of the digital gig economy in which a worker takes on a more skill-intensive project that often requires education or expertise. Online freelance typically involves more interaction with the client than in microwork and generates higher pay. Examples include software design, blog post writing, and marketing. In *Ease of Doing Digital Business*, the online freelance vertical encompasses online freelance.

Digital media: any digitalized content that can be broadcast or published over the internet. Examples include digital images, digital videos, video games, digital publications of books and news articles, and social media.

Subscription-supported content: digital content that is shared via a subscription business model, where consumers pay a periodic fee in exchange for access to content. Examples include streaming sites like Netflix and news websites such as that of the *New York Times*.

Availability of attention (also referred to as "consumer attention"): the focus and time consumers spend watching digital media. Media companies compete to attract consumer attention; by choosing to watch certain digital content, viewers are forgoing other content.

Flow of user-generated content: content that is produced and published online by individuals. Examples include blog posts and YouTube videos.

Local content access: the level of digital news and entertainment content that is available in a country.

Export flow of local content/ability to produce local content: the value of creative goods exported, in millions of USD.

Import flow of global content/access to global content: the value of creative goods imported into the country, in millions of USD.

Digital media usage: the extent to which people engage with social media.

Media monetization: the extent to which it is possible to monetize entertainment and news.

Institutional barriers to create local content: the extent to which there are systemic barriers that increase the difficulty of creating local content.

Institutional enablers to create local content: the extent to which institutions promote local content through government spending on public broadcasting networks and intellectual property protections.

Institutional barriers to access global content: the extent to which institutions enable (or hinder) access to content from abroad, using content blocking and internet shutdowns.

Freedom of expression: the extent to which institutions censor content.

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