Value orientation and comparative analysis on the role of Indian political regime in higher education reforms for innovation drive with china – A theoretical assimilation

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Abstract

China and India, the two Asian giants that are the main forces behind global growth, are in the process of reforming their higher education systems to encourage innovation. This paper examines how India's democratic political leadership has facilitated higher education reform for fostering innovation while highlighting significant differences in the policy approach of the Chinese leadership. It is based on both primary and secondary data sources. A nation's current level of national development can be determined by the calibre of its higher education system, which also serves as a predictor of future economic growth. Therefore, it makes sense that interest in the state of China's and India's colleges and universities would increase as a result of their much-ballyhooed "rise." Several comparative issues merit research, including: Do these nations' lengthy histories in higher education serve as a help or a hindrance in meeting current demands? Are the country's current higher education systems effective at fostering innovation, economic growth, and international competitiveness in the "knowledge economy" of the twenty-first century? What functions do the governments of China and India have in developing "world-class" educational institutions that can fuel and sustain further advancements in science and industry? Can these economic and academic objectives be pursued without having a negative impact on other important objectives like political stability and social equity? Many of the differences can be attributed to political factors, but in ways that go against accepted wisdom regarding the impact of regime type on educational policy. Findings point out areas for reform in India and show that, in terms of right-wing ideological regimentation, the lines between China and India are starting to blur on an epistemic level, which could have implications for innovation.

Keywords: China, higher education, India, knowledge economy, innovation, future economic growth, political leadership

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Introduction:

China and India, the two Asian giants that are the main forces behind global growth, are transforming their economies into knowledge-based ones in order to achieve sustainable economic growth, socioeconomic development, and success in the cutthroat global marketplace, despite to varying degrees recovering from the pandemic. While functioning in a global economic context characterized by the dominance of knowledge and the ascent of "innovation economics," both are plagued by similar development issues such as poverty, income disparity, urban-rural inequality, and health risks (Terzic, 2018). India and China are in the process of overhauling their higher education systems due to the importance of higher education institutions (HEIs) as "production centers of human capital" (Schulte, 2019) for advancing knowledge economies. This change in direction reflects the phenomenon of postsecondary institutions' roles shifting from "cultivating gentlemen in Newman's ideal, the Humboldtian promotion of science and scholarship, to Kerr's teaching-research-service uses of the "multiversity," and then to be a vital engine for the global knowledge economy" (Chen, 2012: 101).

Innovation can be categorized into "knowledge generation, knowledge impact, knowledge dissemination, intangible assets, creative goods and services, and online creativity" when measured in terms of output (Chiu et al., 2016: 370). In fact, "transformation of human capital" (Schwab and Zahidi, 2020) in the form of reskilling and upskilling as well as investment in innovation is essential in the wake of technology-induced disruption of labor markets. According to Dutta et al. (2019), a variety of social, political/institutional, and cultural aspects as well as the level of economic growth and economic size all contribute to innovation. According to Chiu et al. (2016), when institutions are weak, significant investments in education or R&D can only help with knowledge impact—the economic value of a nation's new products and services for the nation as a whole—rather than knowledge diffusion or transformational innovation, which is the influence of a nation's new goods and services on the global innovation market. As a result, they rank China and India among the Cluster countries that outperform low-income nations in terms of innovation performance but lag behind Cluster 4 nations (like the United States, Canada, and Japan) in terms of the spread of knowledge or the impact of their innovations around the world.

China and India have recently raised in the innovation rankings. China, the only middle-income economy to rank in the top 30, maintains its 14th place in the Global Innovation Index (GII; World Intellectual Property Organization (WIPO), 2020), after entering the top 15 in 2019. India, a "lower middle-income economy," debuted in the top 50 in the GII 2020 edition at position 48. Notably, with 37 million and 34,5 million students each, China and India have the largest higher education systems in the world. In comparison to China, which has a GER of 51.6 and 51,649 colleges and institutions, India has a GER of 26.3. The 13th Five-Year Plan (FYP) (2016-2020) of China granted the go-ahead for "innovation-driven development" and charged its universities and research institutions with setting up "national technology innovation centers." Additionally, the Ministry of Human Resource Development's 2020 National Education Policy (NEP) for India emphasizes the necessity of higher education serving as the cornerstone of "knowledge production and innovation" in order to strengthen the country's economy (pp. 33).

This study examines how higher education reform has been made possible by India's political leadership in order to promote innovation. Additionally, it highlights significant variations in the Chinese leadership's approach to policy. The study thus fills a gap in comparative research on HEIs in China and India (Bingman, 2010; Kapur and Perry, 2015; Perris, 2015; Reddy et al., 2016) that have overlooked the knowledge economy component despite its importance in both nations' economic and educational aspirations. In addition, with the rise of both China and India, there is now research comparing the development of the two countries' economies in terms of innovation (Crescenzi and Rodriguez-Pose, 2017; Fan, 2011; Kennedy, 2016). However, this section ignores the part of higher education that is the subject of this paper. It's interesting to note that while India is a parliamentary democracy that is currently ruled by the rightist party at the center, China represents a monolithic political structure. Liberal democratic regimes are typically connected with individual liberty and freedom of speech and expression, while single-party systems are typically renowned for dictatorial and ideological control over society. In order to promote innovation driven by universities, both governments' policy strategies and practices should be the subject of qualitative research. Higher education in imperial China formed a cornerstone of political strength and stability that served to sustain the system for generations by socializing and choosing smart, ambitious young men for government service. Although few low-income families could really afford the schooling needed to pass the imperial tests, the fact that candidates were not limited by their place of origin or social class gave the system an exceptional amount of public support. The justification for Chinese imperial rule was what historian Joseph Levenson referred to as "culturalism" or a conviction in the superiority and applicability of Confucian principles and practices learned via classical education. Non-Chinese people might also join this superior civilisation if they learnt to read literary Chinese and received a good education in the Confucian classics, fulfilling the promise of Confucian culturalism that it was not only applicable to the Sinic world. Education in India, on the other hand, had traditionally had a more religious and exclusionary purpose. Due to India's historically weak state, education was primarily a private industry with little official funding. The oral learning practices, which were based on the memorizing of sacred texts, were prevalent. Lower castes and women were excluded. Although there is scant information regarding education in ancient and medieval India, some of the big monasteries and temple schools evolved into centers of higher learning, with Taxila, Nalanda, and Vikramshila being the most notable. Following seven centuries of Islamic domination, most Buddhist and Hindu educational institutions, particularly those in North India, were destroyed.

Limitations of the existing scholarship:

Notably, the quantitative literature currently available fails to uncover the required links between democracy and innovation (Gao et al., 2017). Additionally, democracy has no statistically significant direct impact on economic growth (Baum and Lake, 2003). A study by Gao et al. (2017), for instance, revealed that democracy has "no direct positive influence on innovation measured with patent numbers, patent citations, and patent originality" using data from 156 nations between 1964 and 2010. WeBaum and Lake (2003) explore the political economy of growth and mention the viewpoints of "compatibility" and "conflict" in their analysis. While the compatibility perspective sees democracy as a constraint on government economic intervention that promotes progress, the conflict perspective contends that "redistributive policies" brought on by "populist pressures" under a democracy are detrimental to that same growth. The ideology-innovation relationship may be used to summarize the democracy debate at the micro level, particularly in the context of private funding for higher education, encouraging R&D, and the political commitment to resource allocation, subsidies, and tax incentives (Dolfsma and Seo, 2013; Wang et al., 2019). According to Wang et al (2019) in their analysis of 110 nations from 1995 to 2015, capitalists who are "more ready to engage in R&D activities and more likely to support the use of new technologies, thus promoting the advancement of technology" tend to gain from right-wing ruling parties (pp. 1233). In this instance, trademark and patent filings indicate technical advancement. However, due to concerns over potential negative impacts on the working class, leftist and central-leftist political groups have inherent worries about new technology (Vivarelli, 2014; cited in Wang et al., 2019). Yet another viewpoint goes beyond rightist-leftist conventions or even the gap between the welfare state and the capitalist state. As a result, the "innovation state" of the twenty-first century (Etzkowitz, 2018) seeks to increase productivity through initiatives including funding for research and technology and encouraging the expansion of new businesses in partnership with business and academia. And universities play a crucial role in innovation, particularly in terms of attracting and developing talent, conducting fundamental research to enable "technological development," commercializing that research through patenting, and codifying knowledge through publications (Watney, 2020). Whatever the case, it is important to look into how Indian colleges have performed in fostering innovation, particularly in light of the fact that Indian policymakers sometimes consider the development of China and other larger economies when evaluating India.

Methodology and paper organization:

It is a qualitative research that combines analysis, comparison, and description. The comparative part focuses on highlighting the most important distinctions between India's and the Chinese leadership's approaches to policy. The policies and practices of the Indian leadership regarding innovation through HEIs are supported by the descriptive-cum-analytical feature. Quantitative measures were examined for comparison between the two countries in addition to the content and thematic analysis. As a result, the first section of this paper gives a quick overview of the quantitative measurements of innovation coming from Chinese and Indian universities before giving a brief account of the political economy of reforms to higher education in both nations. The second section covers how the Indian government supports innovations through HEIs by providing policy direction, a supportive regulatory environment, and financial support (Hoareau et al., 2013). The "level of autonomy" that universities possess in terms of organizational ("university governance structures, legal frameworks for collaboration with private organizations and the use of IP"), academic, financial, or staffing matters is assumed by the regulatory framework's support for universities' "innovation capacity" (Reichert, 2019: 51). The final section focuses on how the policies and practices of the Modi government may affect innovation at Indian colleges. Major conclusions are addressed in the concluding section.

Universities and innovation:

Despite their current asymmetry, India and China are frequently compared in the battle for innovation since they are both BRICS (Brazil, Russia, India, China, and South Africa), a grouping of growing economies in the global economic architecture. In fact, the BRICS Innovation Competitiveness Report 2017 by China's Science Technology Exchange Center forecasted that thanks to aggressively promoting science, technology, and entrepreneurship, India might surpass China in terms of innovation competitiveness in 2025–2030. Indian officials are working to close the gap so that this promise can be realized. This project also covers the area of higher education, where Table 1 provides the most important quantitative indicators for comparing the two nations. Science advancement, technological innovations, and the creation of new markets and businesses are all regarded as indicators of innovation in Reuters' ranking of the World's 100 Most Innovative Universities. The dynamism of research universities contributing to cutting-edge technical solutions and original discoveries is captured by this measure, even though it may not be the yardstick of innovation. The top four hotspots are the United States, Germany, France, and the United Kingdom, with South Korea, Japan, and China following (Figure 1). Tsinghua University in China, which ranked 41st, submitted 834 fundamental patent applications between 2012 and 2017 with a 62.7% success rate in patent grants. Additionally, according to academic articles mentioned in patent filings, its commercial impact score (34.8) shows "how frequently basic research originating at an institution has influenced business R&D activities" (Ewalt, 2019). Peking University, Zhejiang University and Shanghai Jiao Tong University were three additional Chinese universities that made the list.

Due to Indian colleges' low degree of patent filing and commercial impact, no Indian university was able to claim the top rank. It should come as no surprise given that Indian colleges are at the bottom of the heap in global university rankings. The slow progress of Indian universities serves as a warning to policymakers in India that China, a geopolitical rival and a nation with demographics and socioeconomic issues that are quite comparable to India's, has quickly and tenaciously defined its ascent in the knowledge economy. This is particularly notable given both nations were considered "emerging technical powers" only a few years ago (Dahlman, 2007). Unquestionably, the Indian startup ecosystem has developed to become the third largest in the world, primarily supported by domestic venture capital firms, old economy businesses, and angel investors (Sengupta and Narayanan, 2019). But the lack of top-tier research universities limits the role that universities play in fostering innovation. Only 393 patents were granted to a total of 892 Indian institutions between 1958 and 2017 (Selvamani and Arul, 2019), despite the fact that the number of patent applications increased from 42,763 in 2014–2015 to 50,659 in 2018–2019 and the percentage of patents granted increased from 14% to 30%.

Notably, in terms of university-industry R&D collaboration, China ranked 29th and India 45th on the Global Knowledge Index. China is also addressing the discrepancy between industry and government contributions to R&D, which are 77% and 16%, respectively, and Chinese universities' participation, which is only 7%. For instance, Chinese HEIs boosted their R&D investment by 23.2% in 2019 compared to 2018 (Adams, 2021; Hu, 2020a). The classification of universities in developing nations as typically serving as "training grounds for knowledge workers rather than innovators" is thus drastically changing in China (Wu, 2018: 125). A related finding is that, in the case of India, the contribution of business enterprises and public sector industry is 37% and 4.6%, respectively, while the contribution of business enterprises and state governments together accounts for 51.8% of gross expenditure on R&D (GERD), leaving a smaller portion for the higher education sector. In actuality, the Defence Research and Development Organization (DRDO) alone accounts for 31% of the central government's GERD. As a result, India's democratic state participates in R&D at a higher rate than China's communist state, even though it may be argued that R&D investment from state-owned firms extends the role of the Chinese government in China (ChinaPower, n.d.).

Another sign of university-driven innovation is technology transfer. Except for elite universities like the Indian Institutes of Technology (IITs) in Delhi, Bombay, and Kharagpur, the rate of such transfer in India is unknown, but its level is known to be low. In China, university technology transfer organizations were started in the 1980s to help with technology transfer (TT) between academic institutions and business (Zhang et al., 2018). Such initiatives were supported by the necessity of rapid economic expansion, which was acknowledged by China's top leadership and made clear by a number of actions like Special Economic Zones (SEZs). There are eight different types of TT organizations at Tsinghua University, including the original TT office, the renewed TT office, university-run businesses, university science parks, university-owned businesses, national engineering research centers, university-region joint research institutes, and university-enterprise joint research centers (Zhang et al., 2018). Additionally, TT contracts with businesses produced an average of roughly 13% of R&D revenues in higher education between 2000 and 2014. (Wu, 2018: 142). However, it is estimated that less than 10% of Western colleges transfer technology to their Chinese counterparts. Therefore, as will be discussed later in this paper, the Chinese government is eager to increase this rate. With 48,998 articles in 2018, India ranked third globally in terms of the number of scientific publications, cementing an impressive position. China, which ranked first, had 5,28,263 publications in the same year, in part due to active international authorship cooperation, according to the Economic Times. Although China had a faster average annual growth rate of scientific publications between 2008 and 2018, India had the fastest average annual growth rate at 10.73% (The Times of India, 2018). Additionally, India's publication momentum has accelerated to outperform other countries globally:

Indian scholars are publishing more frequently than researchers worldwide on significant issues pertaining to sustainable energy, health, and agricultural development. On smart grid technologies, photovoltaics, biofuels and biomass, and wind turbine technologies, respectively, 1.5 and 1.8 times the global average. It publishes three times as much research as the average country worldwide on crops that are climate-ready. The amount produced in these areas—traditional knowledge, water harvesting, conserving genetic variety, and pest-resistant crops—is more than twice the global average (Niazi, 2021)

Regarding the significance of citations, India's 235 frequently referenced articles in 2011 represented 0.52% of its entire output of science and technology papers, while China had 1131 frequently cited papers, placing it first among the BRICS nations (Shan et al., 2017). China clearly outperforms India in innovation indices. It can be attributed to China's ferocious national ambition, political culture of defining goals and actively pursuing them, and the continuity of the political regime allowing for swift reforms and unbroken execution. In fact, fulfilling China's strategic objective to promote innovation-driven development depends heavily on higher education. The national plan for China (2010–2020) emphasizes the critical position that HEIs play in the "state innovation system by encouraging them to contribute to innovation in knowledge, technology, national defense, and to regional innovation systems" (pp. 19–20). The main goal of the policy is to move China from being a "innovation sponge" to a leader in innovation.

Political economy of higher education reforms

According to historical records, China's higher education system from 1949 until the middle of the 1970s was mostly focused on indoctrinating students with communist ideologies and providing them with technical skills to support the planned economy (Jain, 2019). Education reforms were initiated by Deng Xiaoping, the People's Republic of China's leader from 1978 to 1989, who saw education as the "crucial underpinning for a drive towards economic and technological modernization" (Qiping and White, 1993: 410). This change prepared the way for the massification of higher education, which was necessary to unleash the nation's productive forces in line with the economic liberalization program. Between 2001 and 2010, China's gross domestic product (GDP) growth rate averaged 10.5%, making its economic success story apparent. Although debatable, the term "Beijing Consensus" was given to it because of its strong economic performance and signifies support for the "authoritarian capitalism" practiced in China as opposed to the Washington Consensus, which is based on the "primacy of the market." The conventional growth model was eventually shown to be unsustainable due to the persistence of poverty, "sagging exports," regional inequality, environmental deterioration, and escalating social unrest (Jain, 2017). Additionally, China's "innovation imperative" resulted from its aging population, declining labor force, and declining return on fixed asset investment, as well as other factors (Woetzel et al., 2015: 9). As a result, the political economy of China's higher education reforms was supported by the change in China's economic growth model through the 13th FYP. The 13th FYP defined a new growth model that promotes technological innovation instead of carbon-based, export- and investment-dependent growth, which was further emphasized in the 14th FYP (2021–2025). The political economy perspective holds that India's "import substitution industrialization (ISI)" (Datta, 2017) agenda required indigenous human capital on an appropriate scale in the post-independence, socialist democratic India. IITs and Indian Institutes of Management (IIMs) were founded as independent technical institutes with funding from the central government and became centers of excellence because the state investment in basic and heavy industries required a steady supply of engineers and technical experts (Datta, 2017). Between the early 1950s and the early 1970s, there was a clear policy focus on higher education rather than basic education (Kapur and Perry, 2015), which led to increased spending on higher education. Following the economic reforms of 1991 and the widespread occurrence of the "primacy of economy" in the neoliberal era, India's economic integration into the world economy necessitated the injection of competitiveness. A high-level advisory group to the prime minister called the National Knowledge Commission was established in 2006 to help create a "knowledge-oriented paradigm of growth." Its mandate included enhancing the quality of India's educational system. Later, the United Progressive Alliance (UPA) government established the National Innovation Council to aid in the creation of "innovation ecosystems at universities through University Innovation Clusters" and help the nation become a "innovation nation" (National Innovation Council, 2013). Then, in order to better prepare us for the 21st century, Prime Minister Manmohan Singh further declared 2010-2020 to be the decade of innovation. He said, "The time has come to create a second wave of institution building and of excellence in the field of education, research, and capability building." Additionally, the 11th FYP of India (2007–2012) called for the establishment of 14 top-tier innovation universities in India (DrEducation, 2009). Additionally, the Science, Technology, and Innovation Policy (STIP, 2013) advocated for the "migration of professionals from academia to business and vice versa" and placed an emphasis on "academia-research-industry linkages" through "unique and creative channels." So, during the UPA administration, a number of initiatives and policies sought to put the nation on the path of innovation-led growth. The new government, headed by Prime Minister Modiji launched an innovation drive under the overarching slogan of "atmanirbhar Bharat," or an independent India (Economic Times, 2020) Modi urged students to "innovate, patent, manufacture, and profit" and stressed that innovation is the way forward for a "New India."

Current regimes, universities, and innovation:

India's NEP, launched by the Modi government in July 2020, recognizes that the country invests a meager 0.69% of GDP in research and innovation (R&I), compared to 2.1% in China or 2.8% in the United States. It suggests increasing research funding to help India's growth in "global knowledge production" (pp. 45). The policy calls for the National Research Foundation (NRF) with a "overarching goal" to infuse research culture in Indian universities and competitively fund research in multiple disciplines: science, technology, social sciences, and arts and humanities. This is done to address the lack of focus on research and innovation at Indian universities (pp. 45). The government declared in its 2021 budget that the NRF will get 500 billion rupees over the course of five years. The NRF will "seed, grow, and support research at academic institutions, particularly at universities and colleges whose research capacity is now in an embryonic stage," in the words of K. Vijay Raghavan, Principal Scientific Adviser to the Indian government. Notably, most Indian universities place an excessive emphasis on teaching, with less than 1% of the over 40,000 HEIs in the nation involved in research and the majority of R&D funding going to prestigious institutions of excellence and government laboratories (Kumar, 2021) (Nature, 2021). India has just 253 researchers working in R&D (per million populations) in 2018, compared to China's 1307. India has 110 of these researchers in 2000, compared to 539 in China. Consequently, both nations claimed a rise of over 50%, but China outpaces India in size by a factor of five. It's interesting to note that despite having 2.6 million STEM graduates in India in 2016, not all of them pursue or are qualified for careers in research. The Prime Minister's Research Fellows (PMRF) Scheme, which was introduced in the Budget 2018-2019, is anticipated to inspire "meritorious" graduates to pursue careers in research in order to support "growth via innovation." 38 institutions in the nation, including all of the IITs and the Indian Institutes of Science Education and Research, are currently offering these grants (IISERs). The proposed STIP for India likewise calls for doubling the number of researchers with full-time equivalents every five years. Universities were further encouraged to submit more patent applications under India's National Intellectual Property Rights Policy (Government of India, 2016). It included procedures for developing IPR expertise in academia, creating institutional IP policies and strategies, implementing IP teaching, and strengthening IP Chairs in HEIs to deliver "excellent teaching and research," all of which are pertinent to postsecondary institutions (pp. 18). In reality, increasing technological commercialization at Indian HEIs has been acknowledged as beginning with IP protection. As a result, institutions have established IPR cells to help students with legal advice and paperwork filing, and patent filing has become more popular (Viegas, 2019). The Kalam Program for Intellectual Property Literacy and Awareness (KAPILA) was established to enlighten academics and students in higher education about the processes and mechanisms involved in filing IP in India and around the world. Another policy focus in both China and India is the cultivation of talent in the field of artificial intelligence. Universities must offer doctoral and master's degrees in machine learning and in multidisciplinary domains ("AI"+"X"), according to India's NEP 2020. China's 2017 AI development plan, which outlines the following steps, establishes a clear link between AI talent and the nation's educational system. It calls for developing "high-end talent teams as the most important development of artificial intelligence" and strengthening "the talent pool and echelon construction, especially to accelerate the introduction of the world's top talent and young talent, and form China's talent highland of artificial intelligence" (Jain, 2020). The Artificial Intelligence Innovation Action Plan for Institutions of Higher Education was introduced by China in April 2018. It states that by 2030, colleges and universities will be the driving force behind creating the world's primary AI innovation hubs and will direct the development of a new generation AI talent pool. This will give China the guaranteed talent it needs to advance to the front of innovation-oriented nations.

The government's Innovate in India program encourages industry-academia collaborative research with a specific goal on creating a US$100 billion bio economy by 2024 (BIRAC, n.d.). Notably, facilities for bio-incubation have been established at institutions like the University of Hyderabad, Ahmadabad University, and Manipal Academy of Higher Education under the program of Bio-incubators Nurturing Entrepreneurship for Scaling Technologies. Like the aforementioned projects and schemes that dot India's innovation landscape under the current leadership, it is evidently a top-down initiative. In contrast to the US model, where industrial clusters predominate in defining the innovation system, government intervention is actually a crucial component of national innovation systems in both China and India (Wonglimpiyarat and Khaemasunun, 2015). According to Li et al. (2020), the Chinese government has a "dominant role" in initiating, funding, and overseeing significant innovation projects. It also owns nearly all major research institutions, has established "primary innovative infrastructures" like science parks and startup incubators, and has created and revised laws and policies governing innovation and entrepreneurship (pp. 511). As evidenced by a flurry of initiatives, the Indian government is a centrifugal force in encouraging innovative competitiveness in the higher education and industrial sectors (Table 2). India's science and technology policy, currently under development, places a similar focus on domestic innovation as does China, despite the fact that China's embracement of this strategy dates back to 2006, under President Hu Jintao. In addition, while comparing China's reform of higher education under Xi Jinping to India's, the following significant disparities in policy strategies and factors are discovered. First, the Chinese government is encouraging universities to place more emphasis on patent quality, such as commercial feasibility, rather than patent quantity. Through knowledge production, it has highlighted the critical role played by universities in the chain "from ideas through development and commercialization." China is now outgrowing the stage that India is in as a result. It is advocating for "innovation evaluation," taking a page from top-tier colleges. In order to promote innovation, government participation in determining objectives for universities has increased under the Xi regime. Positively, it is a corrective action to stop "junk patents" that had developed as a result of the Ministry of Education (MOEearlier)'s evaluation criteria for university researchers, notably the number of patents, and the resulting pressure to reach performance goals (Cheng and Huang, 2016).

In the context of India, university-industry technology transfer necessitates addressing a variety of issues including the dearth of creativity and critical thinking in curricula, the overemphasis on publications due to a lack of knowledge about patenting and commercialization, the absence of active IP cells at universities, the lack of qualified individuals to manage IP/technology transfer activities, and the tension between commercially viable and academic research (Ravi and Janodia, 2022). Therefore, simply constructing IP cells won't be enough. In general, the majority of Indian institutions, which have been integrated into the teaching layer of higher education, are still getting used to the idea of commercialization.

Table 2. Innovation measures for Indian higher education institutions, 2014–present

Sl.NO	Policies	Programs/Initiatives
01	National Education Policy	Atal Innovation mission
02	National Innovation and Startup Policy for Students and Faculties in Higher Education	National Research Foundation
03	National Intellectual Property Rights Policy	Smart India Hackathon
04	Science, Technology, and Innovation Policy (currently in the draft form)	Institution's Innovation Councils
05	Science, Technology, and Innovation Policy (currently in the draft form)	The Global Initiative of Academic Networks in Higher Education Innovate in India KAPILA—Kalam Program for IP Literacy and Awareness

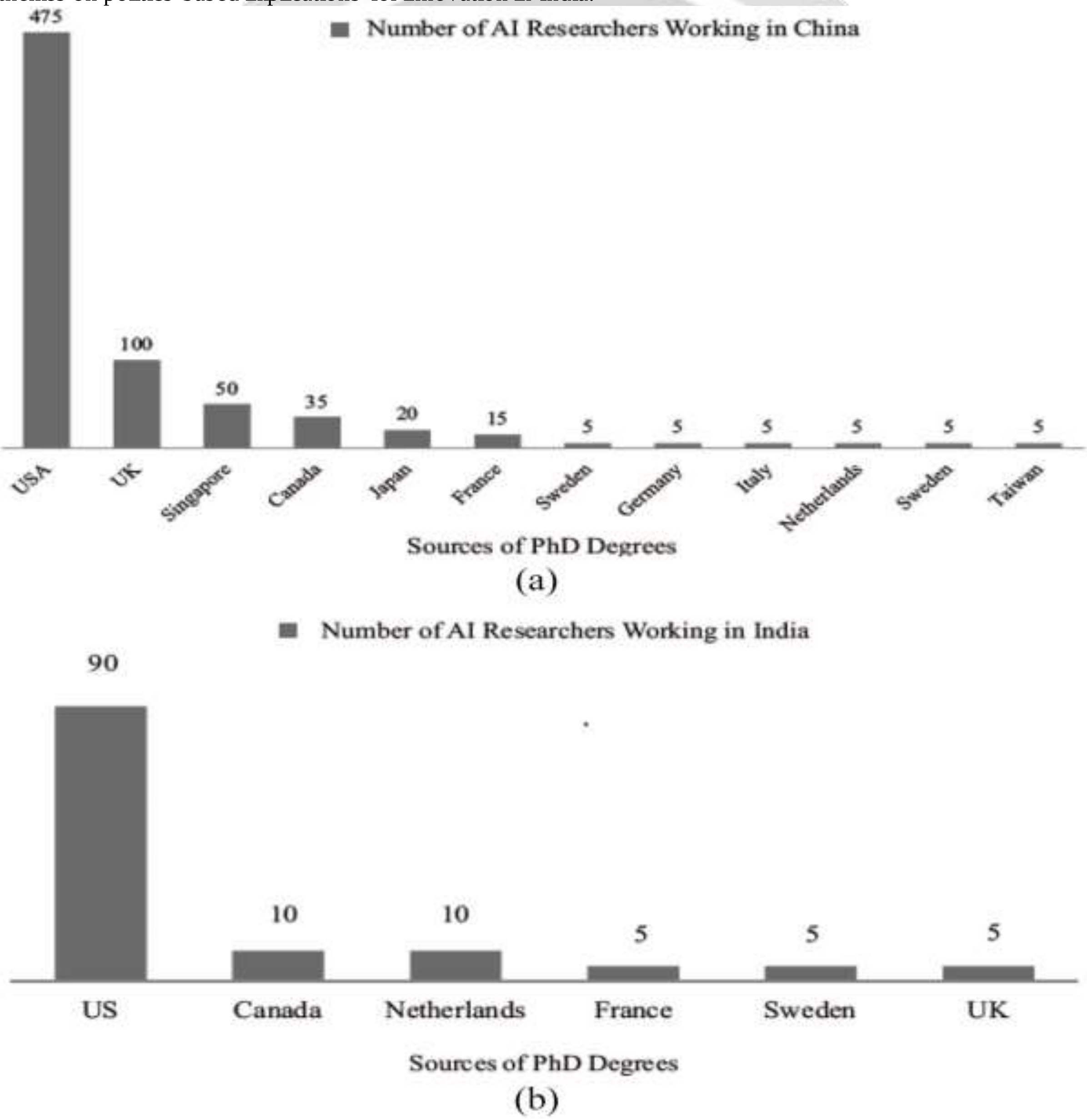
Despite China's adoption of an indigenous innovation strategy dating back to 2006 under President Hu Jintao's leadership, India's science and technology policy, which is currently being developed, places such focus. In addition, while comparing China's reform of higher education under Xi Jinping to India's, the following significant disparities in policy strategies and factors are discovered. First, the Chinese government is encouraging universities to place more emphasis on patent quality, such as commercial feasibility, rather than patent quantity. Through knowledge production, it has highlighted the critical role played by universities in the chain "from ideas through development and commercialization." China is now outgrowing the stage that India is in as a result. It is advocating for "innovation evaluation," taking a page from top-tier colleges. The following are some examples of government regulations in this situation, according to the China Daily:

- The government would help create courses in IP management and technology transfer as well as set up IP management offices at "better-resourced" universities.
- Technology transfer will be given more weight in performance evaluation than the quantity of patent applications and grants.
- Universities have been asked to reduce the financial incentives for granting patents in favour of giving innovators a larger portion of the profits from commercialization.

In order to promote innovation, government participation in determining objectives for universities has increased under the Xi regime. Positively, it is a corrective action to stop "junk patents" that had developed as a result of the Ministry of Education (MOE)'s earlier evaluation criteria for university researchers, notably the number of patents, and the resulting pressure to reach performance goals. In the context of India, university-industry technology transfer necessitates addressing a variety of issues including the dearth of creativity and critical thinking in curricula, the overemphasis on publications due to a lack of knowledge about patenting and commercialization, the absence of active IP cells at universities, the lack of qualified individuals to manage IP/technology transfer activities, and the tension between commercially viable and academic research. Therefore, simply constructing IP cells won't be enough. In general, the majority of Indian institutions, which have been integrated into the teaching layer of higher education, are still getting used to the idea of commercialization. Innovation and Science @Bharat, a division of the Office of Principal Scientific Adviser (PSA) to the Government of India, is working to establish partnerships between academia and industry in the form of joint R&D, the establishment of Centers of Excellence (CoEs) by industry in academia, and innovative solutions for social good. This is done in order to give university-industry collaboration a boost. Intriguingly, analysis of the PSA-released list of results reveals that (1) the Indian government has a disproportionate presence in these collaborations (other than that of foreign companies), with a negligible share of domestic private companies, and (2) the major role of IITs, which suggests a need for diversification supported by research capacity across non-IITs. For instance, the government-owned National Buildings Construction Corporation (NBCC) Limited will build a lab as a Center of Excellence on the campus of the Indian Institute of Technology (IIT) in Madras, and Bharat Electronics Limited has shortlisted R&D bids from the IITs. It's interesting to note that the Election Commission of India's acceptance of an IIT proposal is included on the PSA list as an illustration of industry-academic collaboration (Innovation and Science @Bharat, n.d.).

Politics and higher education: implications for innovation in India:

The previous sections illuminated differences in policies and operation of Indian and Chinese political regimes in terms of impacting HEI-induced innovations. With this, the areas of improvement for India were brought to light. However, while policy directives, funding, and schemes may be considered tangible measures to promote innovation, the intangible aspect of state support manifests in the government's grant of autonomy and its policy practices. And this is why, given the paper's focus on India, this section highlights practical challenges for India. Based on news stories and semi-structured interviews with university vice chancellors and academics, it presents themes on politics-based implications for innovation in India.



Above figure showing AI talent inflow to China and AI talent inflow to India

Another implication is the violation of institutional autonomy. One example is the resignation of Indian Institute of Technology, Bombay Chairman of the Board of Governors Anil Kakodkar, a nuclear scientist, due to meddling from the government. Without a doubt, the problem of a lack of autonomy is not new. Demands for university autonomy in selecting candidates for academic positions and setting fees have existed in the past. However, under the current system, state meddling goes beyond a web of laws and regulations, leading to a decline in the standards in hiring professors and staff members and clearly arbitrary hiring decisions. Evidence points to a rise in party affiliation as a recruiting factor at the expense of talent, with ramifications for teaching and research quality. This makes the current lack of faculty worse. The number of students enrolled in higher education institutions increased from 32.3 million in 2013-2014 to 36.6 million in 2017-2018, however the overall number of teachers decreased from 13,67,535 to 12,84,755 during the same period. India's 24:1 ratio is less than Brazil's and China's 19:1 ratios.

Conclusion:

Due to extensive reforms in higher education, the discussion above showed that China is ahead of India in quantitative indicators of university-driven innovation. China has actually surpassed the United States, the "leading powerhouse" of the globe, in terms of patent applications. As a result, there should be no shocks regarding the innovation gap between China and India. The National Research Foundation is one of many noteworthy policies, plans of action, and initiatives that show how India is catching up. Fundamentally, India's attempts have been portrayed in the government's stated objective of creating a "self-reliant India," whereas China's proactive pursuit of innovation is covered in its Chinese Dream of national rejuvenation. However, it is notable that, in terms of right-wing ideological regimentation, the lines between India and China are starting to blur. In this essay, the study subject of how different political systems have aided their respective nations' innovation drives was explored. Since the former is demonstrating ideological controls and endangering the dissenting culture in democratic India, comparisons between the current regimes in China and India may be made. The government's campaign on Alibaba is thought to have been sparked by its CEO Jack Ma's criticism of financial authorities, despite the fact that China's Tencent is regarded as a world-class inventive firm. Not surprise, the fact that he was forced to resign from his position as president of the Hupan Innovation Center strengthens the communist state's dominance. Therefore, critics are aware of the effects of authoritarianism in a democratic India if it is not restrained. It might be argued that "top-down" initiatives and the financial support of the communist regime play a significant role in the innovative successes of Chinese universities. Additionally, in non-democratic governments like the former Soviet Union, innovation has flourished. Which political structure is most conducive to revamping higher education systems for innovation is not the main focus of this investigation. It is important to highlight that while India's liberal democratic climate has not produced any notable benefits for innovation, as evidenced by the prominence of Chinese colleges; expanding political controls in India are effectively killing off any remaining creative potential.

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