

The 10 TRAITS of GLOBALLY FLUENT METRO AREAS

GLOBAL CITIES INITIATIVE
A JOINT PROJECT OF BROOKINGS AND JPMORGAN CHASE

BANGALORE

GDP (country rank), 2012 ¹	Share National GDP, 2012 ²	GDP/Capita, 2012 ³	Population, 2012 (country rank) ⁴	Share National Pop., 2012 ⁵	GaWC Global City Ranking, 2010 ⁶	# Global 2000 HQs, 2012 ⁷	GDP/c Growth 1993-2012 ⁸
\$34,921,558,371 (5)	0.73%	\$3,963	8,812,542 (5)	0.71%	59	4	4.65%

1) Benchmarks — what is the city’s recent ranking performance in terms of global firms, connectivity, diversity, range of cultural assets, immigrants, visitors?

Bangalore is India’s fifth-largest metropolitan area and is now a top 100 global city economy.⁹ Located inland in southern India, more than 1,000 miles south of New Delhi in the fast-growing state of Karnataka, the metro’s overall competitiveness was rated 23rd in Asia in 2012.¹⁰ In 2011, it was the recipient of the eighth-highest number of foreign investment projects in the world, because of its leading role as an information technology (IT) and now biotechnology center.¹¹ It is consistently rated the leading IT outsourcing city globally, ahead of Mumbai, Delhi, and Manila, because of its experienced firms and large high-tech talent pool.¹² By total jobs created from foreign investment, IBM places Bangalore first globally in 2011, and its investment incentives strategy is assessed as one of the most effective in Asia.¹³

Bangalore is often rated the top Indian city for quality of life, but at an international level it is still seen as providing modest living standards and service delivery. The city ranks 156th in an ECA International study of Asian professionals, just ahead of Chennai (167th) and Mumbai (172nd).¹⁴ The EIU evaluates its physical endowment poorly—among the bottom 20 cities—in comparison to its economic performance, due mostly to an underdeveloped and inefficient transport network.¹⁵

2) Narrative – the city’s journey into and through globalization. What kind of economic and development trajectory has it taken? What has changed over time?

Bangalore's industrialization has been short but has always had an international character. The city was an established node in the British colonial information network. Its original conceptualization as a garden city attracted a cosmopolitan pensioner class with political and commercial links, and attracted many externally facing publishing, media, and film outlets.¹⁶ In the 1940s, the colonial government established Hindustan Aeronautics and the Radio and Electric Manufacturing Company in the city to provide technical support during World War II. A sudden modern industrial presence helped create a comparatively skilled workforce from which later economic transformations would spring.

After national independence in 1947, Bangalore became a preferred location of government laboratories and military research, as Prime Minister Jawaharlal Nehru sought to develop the city as India's intellectual capital. These strategically sensitive industries were seen as more safe in an inland city, and capable of thriving given the city's educated workforce and abundance of cheap electricity from the nearby Shivanasamudra hydroelectric plant.¹⁷

This act of public policy meant the city's outskirts soon became an operational center for the Indian air force and other public sector heavy industry bodies, including Hindustan Machine Tools, Bharat Electronics, and Indian Telephone Industries. Licenses were also provided to large adjoining private firms, including a subsidiary of Bosch. Bangalore soon became host to specialties in radar systems, telecommunications, remote sensing, military equipment, and space research. A relatively affluent lower middle class of public-sector employees meanwhile gained widespread access to good English-based education. Through this confluence of industry and quality education, an unusually large proportion of workers acquired engineering knowledge and commercial awareness that would prove advantageous later.¹⁸

At the beginning of the 1970s, Bangalore was still a small, middle-class, public-sector research and manufacturing city. Strong restrictions on foreign ownership – which led IBM to leave India in 1978 – had the inadvertent effect of encouraging Indian graduates of the Indian Institutes of Technology to leave for the United States to gain experience, and prompted the establishment of small local export-focused software businesses. But national economic policy began to prioritize India's potential as a software exporter. Incentives were provided for specific training and improvement of the conditions under which to import hardware and execute export applications. The Department of Electronics gave precedence to domestic firms in public-sector software procurement, thereby stimulating local demand.

The first overseas firm to identify and utilize this cluster of talent was Texas Instruments (TI), which established an offshore center in Bangalore in 1985 upon the advice of Indian Senior Vice President Mohan Rao. TI showed others – including Motorola and HP – Bangalore's offshore potential despite bureaucratic impediments. The company focused its activity initially on maintenance and application work. Meanwhile Bangalore software firms entered the industry, often as part of larger conglomerates, and gradually became large service providers. These included Tata Consulting Services, Wipro, and the start-up Infosys.

In the late 1980s, Indian returnees with experience in North American technology began to develop commercial links with Bangalore, and they used local programmers to provide software development support. Development centers grew in number across the city, while front-end sales and marketing often remained in the United States. In 1990 the Department of Electronics created the Software Technology Park in Bangalore, which heralded the deregulation of imports, freedom for 100 percent foreign equity investment, and tax incentives. The park provided the infrastructural stimulus for the city to enter the global market. Bangalore was nicknamed the "Silicon Plateau," as it sought to transition to higher-value-added activities by capitalizing on the programming demands of the "Y2K crisis."¹⁹

Business growth in the city had caused, however, an unregulated urban sprawl. Government management capacity to oversee the city's housing and water infrastructure amid rapid land speculation was limited. The Karnataka state government response was to decentralize and privatize city government functions in order to support private-sector growth, with the focus on the end-users of service provision.

More and more multinational firms began to set up development centers in the 1990s. Bangalore engineers took on a series of coding and data-processing tasks for American and European banks, insurance companies, and health firms. This precipitated the transition into higher-end functions such as design, in areas such as digital signal processors. With a decade or more of experience in the sector, software services firms began to successfully raise venture funding from large banks and technology firms to begin research and development services. By 2000, over 90 percent of multinational firms in Bangalore's Software Technology Park were presided over by Indians who had lived and worked abroad (many working for parent companies) and who had specific knowledge of the requirements of the U.S. market.

Since 2000 local technical expertise has matured through a combination of professional development, training, process management improvements, and high labor circulation, so as to enable a realignment from software services to R&D services. A new generation of entrepreneurial startups is receiving foreign contracts to develop bespoke products in fields such as wireless telecommunications. Bangalore has evolved into a city of expert knowledge with responsibility for intellectual property development. Local R&D specialist firms are increasingly competitive in the local labor market, able to retain their strongest employees for longer periods. More and more formal alliances between Indian firms and multinationals such as HP and Nortel have taken place since 2000. More than half of the leading IT software and service exporters from India have their headquarters in Bangalore.²⁰

Within 20 years Bangalore's IT-oriented agglomeration has come to function as a hub of specialization within expanded global production networks. Suburban technology parks, such as the 330-acre Electronic City, for example, house electronics and software firms such as Motorola, Siemens, Infosys, and Wipro. This expansion has led the city to more than triple in size and double in population. The city government is now active in projects of land acquisition, airport and motorway construction, and the installation of water and sanitation infrastructure.²¹

An international airport opened north of the city in 2008, with government support in the form of heavily subsidized land and a monorail connecting the airport to a new eastern IT corridor. As Bangalore grows into a large metropolitan area, the Bangalore–Mysore Infrastructure Corridor (BMIC) has sought to alleviate urban density and provide more space for the IT sector, as well as quality-of-life improvements.

Bangalore's remarkable industry growth has not, however, been matched by investment in supporting facilities and infrastructure. IT firms report physical infrastructure, power systems, and transport facilities as major constraints today, exacerbated by the absence of proper coordination between the core agencies responsible for urban development. Given the growing competitive threat of Pune and Hyderabad, Bangalore also faces the challenge of finding new low-skilled labor opportunities, especially as the pace of construction and transport development slows.

3) Elements of international and global orientation - In what ways is the city globally connected and relevant? What sort of trade patterns does it exhibit?

During the 2000s, Bangalore received more of its investment from foreign sources than did any other Indian city. In 2004, for example, Bangalore had garnered 45 billion rupees of foreign investment, representing over 30 percent of its total investment. By contrast, foreign investment made up less than 1 percent of investment in Mumbai and Calcutta, 13 percent in Delhi, and 7 percent in Hyderabad.²²

Bangalore has relatively few foreign workers in the city, but it hosts a wide mix of Indian migrants from across the country, and the influx has grown in the past decade due the availability of IT and construction employment. The most notable international demographic element is the trend of reverse migration of Indian entrepreneurs, venture capitalists, and high-level executives from the United States, beginning from the late 1980s and peaking in recent years.

4) To what extent is the city's international dimension inherited or intentional?

Bangalore's platform to enter global value chains despite disadvantages of location and development has hinged on the city's educational and knowledge strengths, which spurred state and business investment over several generations. This effort began with the establishment of a series of English-medium schools during the 19th century. Later the city became a center for technical education under the supervision of pioneering engineer Sir Mokshagundam Visveswaraiah (Sir MV), and a Government Engineering College was founded in 1917. By the 1960s, a relatively high literacy rate of over 40 percent had incentivized decisions to locate four universities and multiple private colleges in the city.²³

Because of its density of skills and competence, Bangalore has been able to supply knowledge-based industries with large English-speaking labor pools for over half a century. Engineering graduates and diploma-holders became literate in corporate management earlier than in any other city in India. Although no longer a leader in private education, the historical institutional advantage has meant the wider region now produces almost two-thirds of India's engineering graduates, many with international experience. In one not unusual example, a third of R&D workers at General Electric's Bangalore John F. Welch Technology Center are returnees from the United States.²⁴

Bangalore's path into globalization accelerated when, thanks to its knowledge base, it was able to harness the internationalization of its software cluster after TI's arrival in 1985 and then sustain successive climbs up the value chain. The engagement of multinational firms in the 1980s catalyzed Bangalore's specialized growth. The shift from outsourcing to offshore services was fast-tracked by the activity of firms that upgraded into enhanced production processes and acquired new functions that required higher skills. The acquisition by firms of quality certifications made new kinds of contracts with the banking and retail sectors possible, which in turn led to improved project management, quality assurance, and productivity standards.

By the mid-2000s local firms and entrepreneurs had begun to meld into a technical community with a common agenda for growth. Coalitions for mutual representation have emerged in tandem with government laboratories, and these associations reflect a shared awareness of the city's status as an industrial center where products can be developed, tested, and adapted quickly for fast-moving global trends. The establishment of these coalitions reflects an important new phase in the city's global engagement.

Although knowledge advantages were in many ways the foundation for global specialization, Bangalore's software industry growth has also benefited from periodic catalytic support from the Indian government, especially at the key juncture of global economic change in the 1980s. Institutional location decisions made in the post-independence era of state-led industrialization saw Bangalore become a part of a division among four cities of intellectual-technical labor. Bangalore's specialties in core computing were reinforced by Chennai's automobile competencies, Pune's engineering strengths, and Delhi's legal services culture. Later, the national government's first Software Technology Park in 1990 was a catalyst to strengthen the skills base in the city across both public-sector manufacturing industries and also aerospace, defense electronics, and telecom laboratories.²⁵

While the national government stimulus has benefited the city, it is also the case that Karnataka state has historically been much more socially and politically stable than other Indian states – notably West Bengal – with fewer labor disputes and a more open industrial policy. State government bodies correctly identified the opportunity of electronics as a global industry for which non-capital-intensive growth was possible in Bangalore. With the support of the Karnataka Industrial Areas Development Board (KIADB), state-level involvement was instrumental in the establishment of the Electronics City dedicated space on the city's outskirts.

The intentional side of Bangalore's global engagement did not depend on favorable city governance, but reforms since the 1990s did open up important new investment channels. Upon decentralization agreed in tandem with the World Bank, new target-driven parastatal agencies were set up, including the Bangalore

Development Agency and the state (Karnataka) Urban Infrastructure Development and Finance Corporation. They, and others, have been in charge of overseeing development, financing urban infrastructure, negotiating land acquisitions, and constructing a new airport and motorways.

International investment institutions have been critical sources of funds for upgrades to water, sanitation, and roads as the city expands. They have also supported investment into government training, technology, and regulatory apparatuses to improve efficiency. Meanwhile, major projects such as the six-lane toll highway between Bangalore and Mysore are funded and owned by U.S.-based investors. Such capital has catalyzed corridor-style development across the wider region, although public incentives of subsidies, land, and resources remain important given high start-up and maintenance costs.²⁶

Although the 1990s reforms were accompanied by a new civic–business leadership apparatus, the city has not been able to develop a stable leadership structure capable of building local and global assets effectively. The Bangalore Agenda Task Force (BATF), a 15-member nominated body of international-facing nongovernmental organizations, IT and biotech representatives, and senior business figures, was largely supported by a private foundation that backed initiatives (e.g., Clean Bangalore) with seed funding. But its replacement in 2008 by ABIDe Bengaluru reflects volatile party-based affiliations.²⁷

¹ Brookings analysis of Moody's Analytics and Oxford Economics data.

² Ibid.

³ Ibid.

⁴ Ibid.

⁵ Ibid.

⁶ "The World According to GaWC; Classification of Cities 2010," September, 14, 2011.

⁷ The data were produced by G. Csomós and constitute Data Set 26 of the Globalization and World Cities (GaWC) Research Network (<http://www.lboro.ac.uk/gawc/>) publication of inter-city data.

⁸ Brookings analysis of Moody's Analytics and Oxford Economics data.

⁹ "UK Economic Outlook Report: 2009," PricewaterhouseCoopers, 2009.

¹⁰ "Hotspots: Benchmarking Global City Competitiveness," Economist Intelligence Unit, January 2012.

¹¹ "Global Outlook, Destination Cities for FDI," fDi Intelligence, 2011.

¹² "2013 Top 100 Outsourcing Destinations," Tholons, 2013.

¹³ "Global Location Trends 2011," IBM, 2012; "Asian Cities of the Future 2011/12," *fDi Magazine*, 2011.

¹⁴ "Location Rating Survey for Asian Expats," ECA International, 2012.

¹⁵ "Hotspots: Benchmarking Global City Competitiveness."

¹⁶ Elizabeth Chacko, "From Brain Drain to Brain Gain: Reverse Migration to Bangalore and Hyderabad, India's Globalizing High Tech Cities," *Geoforum*, 2007; James Heitzman, "Network City: Planning the Information Society in Bangalore" (Delhi: Oxford University Press, 2004).

¹⁷ Christoph Dittrich, "Bangalore: Globalisation and Fragmentation in India's Hightech-Capital," *ASIEN*, vol. 103, 2007, pp. 45-58.

¹⁸ Rakesh Basant, "Bangalore Cluster: Evolution, Growth, Challenges," in Shahid Yusuf and Kaoru Nabeshima, eds., "Growing Industrial Clusters in Asia: Serendipity and Science" (Washington, DC: World Bank, 2008), pp. 147-93.

¹⁹ Balaji Parthasarathy and Yuko Aoyama, "From Software Services to R&D Services: Local Entrepreneurship in the Software Industry in Bangalore, India," *Environment and Planning A*, Vol. 38, 2006, pp. 1266-85.

²⁰ Elizabeth Chacko, "From Brain Drain to Brain Gain."

²¹ Michael Goldman, "Speculative Urbanism and the Making of the Next World City," *International Journal of Urban and Regional Research*, Vol. 35, 2001, pp. 555-81.

²² Annapurna Shaw and M.K. Satish, "Metropolitan Restructuring in Post-Liberalized India: Separating the Global and the Local," *Cities*, Vol. 24, No. 2, 2007, pp. 148-63.

²³ Ibid.

²⁴ Elizabeth Chacko, "From Brain Drain to Brain Gain."

²⁵ Ibid.

²⁶ Michael Goldman, "Speculative Urbanism and the Making of the Next World City."

²⁷ Ibid.

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