ensure against diversion of any kind from the civilian to the weapons complex,

(c) Provide a timeline for the implementation of this separation and installation of the "fire walls,"

(d) In regular consultation with their US government counterparts, negotiate a full scope safeguards agreement with the International Atomic Energy Agency (IAEA) for the civilian nuclear complex and sign the Additional Protocol, and

(e) Strengthen its export controls further and align its nuclear and missile control lists with those of the NSG and Missile Technology Control Regime (MTCR).

Factors Explaining US Interest in the Nuclear Deal

The US executive branch has not provided adequate information in response to the spate of criticism from its domestic nonproliferation community, although it will provide detailed information, some within classified settings, to members of the US Congress before the vote on amending the Nuclear non-proliferation Act 1978 takes place. And at various points since July, under Secretaries Burns and Joseph, and Secretary of State Condoleeza Rice, have stressed both the nonproliferation and the wider strategic gains from pursuing this agreement with India.

The US executive branch, recognizing the likely points of domestic (and international) criticism, has nevertheless pursued this cooperation with India because it is very clear on certain points. First, the deal does not provide any assistance whatsoever to India's nuclear weapons complex.

Second, the supply of civilian grade fissile material, or building of new power reactors, does not "free up" fissile material or resources that Government of India can then allocate solely to accelerate its weapons program, as alleged by some influential voices in Washington. Separately, Government of India is understood to have communicated to the US Administration that while its pursuit of nuclear weapons capability is non-negotiable, it nevertheless is not pursuing an ambitious and open-ended program or one that seeks numerical parity with its neighbours. Rather, it is building a small, flexible arsenal to enhance deployment options and

survivability, with a second-strike posture, all geared toward creating a "credible minimum deterrent."

The third factor in Washington's calculation is that the July "deal," in effect, places over 80 per cent of India's hitherto unsafeguarded fissile material (and facilities) under international (IAEA) safeguards. Outside of the P-5, amongst the Nuclear Non-proliferation Treaty (NPT) non-signatories, India has the largest stockpile compared to Pakistan and Israel. And whether Iran and North Korea stay within the NPT or not, which are developments independent of the Indo-US agreement, this deal brings the majority of global unsafeguarded fissile material under IAEA safeguards. This is a significant net positive for global nonproliferation efforts, whose importance should not be underplayed, particularly given the growing threats of determined proliferators or terrorists seeking access to fissile material in many of the 44 countries with active nuclear programmes and capabilities.

A fourth factor in Washington's calculations is that the US negotiation with India over the past decade and more was so narrowly configured, with an exclusive nonproliferation focus - seeking membership of the NPT, or capping of its weapons programme, or based on a punitive (embargo-based) approach - that it had led to a sterile outcome. As such, the ambit of the engagement was widened to include recognition of India's strong record on horizontal nonproliferation, strict voluntary controls on sensitive dual-use exports, and rapidly expanding energy needs. And in return for lifting domestic and international restrictions to help meet India's energy needs, it is pursuing an agreement that promotes US (and international) nonproliferation goals without formally recognizing India's nuclear weapons status or augmenting such capability.

A final factor is that apart from China, India is the only other country with a sizeable nuclear energy market that the US and international energy providers can operate in for the next twenty years or more. Since a power reactor providing 1000 mWe electricity roughly translates to a cost of US $1 billion, India and China represent energy markets of at least US $25 billion and US $35 billion respectively. And so for the US administration, pursuing the July deal represents a net-positive situation: meeting India's energy

requirements, making a profit from it, not assisting India's weapons capability, placing India's civilian complex under IAEA safeguards, and possibly helping New Delhi use greater prudence in seeking alternate oil and natural gas sources from regimes that might undermine regional or global security. It thus promotes US nonproliferation goals, and improves the bases for seeking a broader, technology-embedded commercial and defense relationship with India, an emerging power in Asian and global affairs.

Factors Explaining Indian Interest in the Nuclear Deal

For India as well, the deal represents a net-positive situation for four reasons. First, it does not curtail its domain of sovereign decision-making regarding its weapons programme. Second, the deal aims to create the only viable international framework that can accommodate India's unique status and secure it access to civilian nuclear energy. Critics often state India's non-membership of the NPT as a reason why such assistance cannot be provided. This is flawed on two grounds. One, the NPT text does not prohibit civilian assistance to non-members. And two, no one realistically expects India to join the NPT as a non-nuclear weapon state (NNWS) nor can India realistically expect an amendment of the NPT to induct is as a NWS. So this issue is a red herring. But the more intractable problem is the NSG which prohibits members from providing civilian nuclear assistance to countries that do not permit fullscope IAEA safeguards on all their nuclear facilities. India clearly cannot do so because that would mean submitting its weapons complex as well to IAEA safeguards. This implies that the US, and other NSG members interested in entering into civilian nuclear cooperation with India, namely Russia, France, Britain and Canada, are also currently unable to do so. Thus, the deal represents the only viable *modus vivendi* to meet India's needs without violating international nonproliferation rules and guidelines.

A third factor in New Delhi's calculations stems from the constraints and uncertainties in the current status of India's nuclear energy programme. The first stage of India's nuclear power programme comprises 12 Pressurised Heavy Water Reactors (PHWRs), which generate about 2,500 mWe, i.e. a meager 2.5 per cent of current national requirement, which itself is growing rapidly. The scope for scaling up operations with PHWRs remains very limited, even if more reactors, and of larger capacity (500mWe or

higher), could be built. The constraints are not only financial. India's domestic reserves of uranium are limited, sufficient for generating only up to 10,000 mWe from PHWRs, along with the uncertainties attendant with relying on uranium imports from abroad. In the second stage, the Department of Atomic Energy (DAE) plans to use fast breeder reactors (FBR), which can process the spent (uranium) fuel from the PHWRs to create plutonium and residual uranium. If successful, this could generate up to 5,00,000 mWe and vastly improve the energy situation for the intermediate (25 years) term. But DAE has not yet reached the point where it can operationalize this model and generate power at commercially viable rates. And only after the FBRs begin functioning smoothly would DAE be able to proceed to the third stage, of building Advanced Heavy Water Reactors (AHWRs), which can use a mixture of thorium-uranium fuel to run a sustainable power generation programme over the longer term. For the record, DAE is building a 500m W AHWR which it expects will become operational by 2010, but the commercial viability of the AHWR programme still remains to be seen. In this context, the July deal can provide critical additional sources to complement India's domestic nuclear energy options.

The fourth and related Indian interest stems from the fact that international participation in the civilian nuclear sector will bring in newer technologies, proven designs for safer and larger reactors, and result in market-clearing prices and efficiency in power production. Indeed, the July deal has committed Washington to securing India's membership and participation in the International Thermonuclear Energy Research (ITER) and the Generation Four programme that seeks to augment the current nuclear fuel cycle options and make them commercially viable. India's domestic nuclear sector has performed well during the long decades of embargoes and created a pool of technologies that can be adapted to wide uses. With the infusion of commercially viable international technology, reactors and other resources, it is likely that the performance and productivity of the domestic sector will also experience efficiency gains visible in many other sectors since the economic reforms began in 1991.

Recommendations

First and foremost, the Government of India, and especially the domestic critics, must realise the true significance of the July

deal. When implemented, it will amend the US non-proliferation law and grant a substantive exception for India from the NSG. It will, in other words, end the nuclear stalemate between India and the global nonproliferation order that has existed for over three decades. Second, it will permit nuclear commerce with India, providing it commercially viable technologies of nuclear power and plant safety, without which India's long-term economic growth will at least decelerate, if not be inhibited further. Third, from a global standpoint, it will bring India into the nuclear fold, instead of being the most significant "outlier" whose conduct and capabilities merit a position of importance in the shaping of the regimes' activities in the future. Fourth, the deal is designed to achieve all this without impinging negatively on India's sovereign decision-making relating to its nuclear weapons capability and future progress.

In light of the above, the debate in India relating to the implementation of its end of the deal should focus on the following issues. First, is a better, or even a similar deal possible for India in the future? The answer, quite candidly, is in the negative. Second, many US critics of the deal argue that India's voluntary compliance with nuclear non-proliferation is unlikely to change, and so the "rewards" imbedded in the July deal are unnecessary, even if the US desires a broader and closer relationship with India. This brings up the harsh question: would New Delhi be willing to pursue selective proliferation and then blackmail its way into a superior deal with the United States or other prominent members of the global non-proliferation regimes? If not, then why not implement the current deal that provides it the best possible options given its outlier status?

Third, India should realize that such a momentous agreement and attendant benefits cannot come without paying a substantial price for it. But what exactly is the price that the deal extracts from India? The first price is that after having designated and separated the weapons complex from the civilian one, India cannot move a civilian facility back to the weapons side. This relates to the "in perpetuity" phrase later used by an US official that generated sharp debate in the public discourse. But as a Government of India official stated, a credible separation plan cannot permit moving a facility later from the civilian to the weapons complex, because it could create a situation where a facility that received external assistance

on the civilian side is moved to the weapons side, thus aiding India's weapons program, which would be a violation of the July deal.

The second portion of the price relates to including FBRs in the civilian complex. Government of India has every right to negotiate hard on this subject and it should. But its political leadership also has the obligation to ensure that it is not DAE's parochial interests masquerading as India's "national interest" in this negotiation. The DAE is understandably unhappy that it will have to share its authority and oversight over the civilian-designated complex with the IAEA. Further, once the veil of national security is lifted from these facilities, and their performance assessed on international benchmarks, DAE is likely to come across as having performed rather poorly. This negative assessment has actually been made several times by the Atomic Energy Regulatory Board (AERB) and the Comptroller and Auditor General (CAG). But now, questions will be raised more openly about why a country whose first research reactor (Apsara) became operational in 1956, has not done more to reduce prices and increase power production in the past five decades? And now, the metric by which their performance will be judged will likely be the power plants built in India by Russia, Canada, France and the US.

Finally, the critics of the July deal should recall that in 2001-02, Government of India had informally approached the US with an "islanding" proposal and explored a nuclear "grand bargain" whose lineaments were strikingly similar to the July deal. The US and India have since then worked to not only enhance the standards of technology security in India to permit greater US-India trade in advanced dual-use items, but also interacted closely to codify some of India's informal practices in the area of export controls. The former set of efforts was initiated within the High Technology Cooperation Group (HTCG) and later the Next Steps in Strategic Partnership (NSSP). Both have paved the way for the July 2005 deal, which thus should not be seen as a hasty initiative or one that has been undertaken without proper spadework and careful consideration on both sides.

In sum, the critics of the July deal in both countries should recognize the unique and propitious set of circumstances that have

brought the Bush administration and the Manmohan Singh government to negotiate a historic agreement. The fruits of the deal will be nuclear energy for India without curtailing its weapons program. And it will help the US bring India into the mainstream of global nuclear non-proliferation institutions and efforts through the only mechanism acceptable to itself, India, and the NSG. And while India took over four decades to decide on whether it should overtly weaponize its nuclear capabilities, it should remember that it has only a few months to begin implementing the deal before the Bush administration's energies are re-directed towards the Congressional elections at the end of 2006. And if the July deal fails to be implemented, on which both the US and India have staked much of their global reputations, it will be a long time indeed before such an imaginative and far-reaching initiative is considered actionable and prudent by either country.

End Note

1. "Joint Statement Between President George W. Bush and Prime Minister Manmohan Singh," Press Release, The White House, July 18, 2005; http://www.whitehouse.gov/news/releases/2005/07/20050718-6.html

RATE CARD - ADVERTISEMENT IN JOURNAL

	Black and White	Coloured
Full Page	Rs. 2,500/-	10,000
Four Consecutive Full Pages	Rs. 8,000/-	36,000
Half Page	Rs. 1,500/-	10,000
Four Consecutive Half Pages	Rs. 5,000/-	36,000

The American Offer: Uncertain Risk or Beneficial Opportunity?

Lieutenant General Eric A Vas, PVSM (Retd)

When I was in Washington in April 2000, Stephen Cohen invited me for dinner at his Watergate Apartment. He was then Director of the Brookings Institute and a key adviser on South Asian affairs to the US Administration. During the course of the evening, I asked Stephen what book he was currently working on. He said," India, an Emerging Power." I laughed and said, "You are pulling my leg. You wrote that one some years ago." He replied, "That book was *India: an Emerging Power?* This one will have no question mark. America will ensure that it happens." I sensed that Stephen was not joking.

When I returned to India I reported this conversation to influential bureaucrats and politicians in Delhi. They were unconcerned by my information. This is not surprising because, in spite of the National Security Council being set up in 1998, India has no tradition of developing long range assessments of international security developments and making this the basis of both a national consensus as well as our long term policies. This is evident even years later, when our response to the US policy announcing its intention to help India build itself as a major world class power in the 21st Century has been confused. There has been no attempt to assess what the US interests and expectations are.

US Cold War Strategy

In 1947 Americans, brainwashed by the British, believed that Islam would bind Pakistan firmly while India with its multifarious languages, cultures and religions would not remain united. Their lack of faith in India was enhanced by knowledge that the country could not feed itself and was heavily dependent on PL-480 inputs. The 1962 Sino-Indian Conflict made it evident that India could not even defend itself. The Americans were convinced that Pakistan would win a future war against India. They were surprised that this did not happen in 1965.

Lieutenant General Eric A Vas, PVSM (Retd) is a former GOC-in-C Eastern Command.

Journal of the United Service Institution of India, Vol. CXXXVI, No. 563, January-March 2006.

India's victory in the 1971 Indo-Pak War altered America's image about the country. Thereafter, India conducted a nuclear test in 1974, survived an emergency and produced a democratic change of regime, reached settlements with Shiekh Abdullah, the Nagas, and Mizos, had a successful green revolution and launched a satellite. It was Islamic Pakistan which broke up. Whilst accepting that India has the highest number of poor and illiterates in the world, it is also admitted that there is no other example of a de-colonised country building itself into a modern industrial state and also into a multicultural, multi-religious and multilingual democracy.

For the US, the Soviet Union was a military adversary and the Cold War was a power struggle. The Soviet Union had to be confronted and contained ideologically, militarily, politically, economically and technologically. Winning over China, an ally of the Soviet Union, was part of that strategy. Since India would not allow itself to be part of the containment plan, the US tilted towards Pakistan against India. In 1990 the Cold War ended with the Paris Agreement. Historically, it was a unique event. Two adversaries armed to the teeth with missiles and nuclear weapons, confronting one another militarily for over four decades signed a treaty to disarm without having fought a war. Both powers realised that the role of the military in a nuclear age was not to fight wars but to prevent wars from breaking out.

Post 9/11 Strategy

The nineties saw India's growth rate rise to 6 per cent. In 1998 India demonstrated at Pokhran that it could produce thermonuclear war-heads. It launched a geo-synchronous satellite into space. Its poverty level came down and its scientific community started making a significant impact on the Information Technology revolution. The contribution of Indian scientists to US research and development came to be recognised. India started accumulating a sizeable foreign exchange reserve. It also demonstrated that its coalition governments provided political stability to the system. India fought to regain the Kargil heights from Pakistan with remarkable restraint. The 11 September 2001 incident was a turning point in the US approach to India, which was acknowledged as one of the nations with a very large Islamic population free of al-Qaida and jehadi influences though the country was being subjected to externally inspired terrorism.

By now the course of events in Vietnam, Afghanistan and Iraq had demonstrated that in today's world it is easier to invade a country than to keep it occupied. War is, therefore, no longer an instrument of politics as it was considered earlier. Nor are nuclear weapons and missiles a currency of power, which they were earlier. This did not mean that armies could be disbanded. That cannot happen while there are rulers who have not reached this conclusion.

Today's globalised world gives rise to many problems, but globalisation is an inevitable result of the electronic age. The world's economy is so integrated that the value of the Chinese currency has its impact on the US economy and outsourcing both in manufacturing and services has become the order of the day. The currency of power is knowledge. The US would like to continue to be the pre-eminent nation in the world. However, a recent forecast by the National Intelligence Council of the US has assessed that the US, China and India would be among the first three markets of the world by the year 2020.

Dealing with China

Given China's inevitable rise of per capita income, there is nothing to prevent it becoming the richest nation of the world. Since wars are no longer cost effective, the rivalry between the US and China for pre-eminence in the world is not likely to be solved by war. Since the future currency of power is knowledge, US efforts are concentrated on ensuring that it stays ahead of China in terms of knowledge generation, inventiveness and technology. After having fought a war with China in Korea [1950-53] in which thousands of Americans perished, the US made a complete U-turn in its policy towards China. After 1971, it began dealing with China not as an adversary but as a rival. This strategy is the exact opposite of confrontation or containment and implies engagement. While the US had avoided trade and economic links with Moscow during the Cold War, it has become the largest trading partner of China and is heavily involved in the Chinese economy.

China responded enthusiastically to this US strategy and embraced American investments on a massive scale. They sent their students in thousands annually to US universities. The Americans have succeeded in persuading the Chinese leadership to abandon Communism in economic terms. Today, Chinese Communism is only a cover for authoritarian rule by the Communist

Party. By so doing China did not lose its sovereignty or give up its vital interests. On the contrary, today the US worries about China becoming a serious rival. US efforts are on how to bring about change in China to make it accept democracy and abide by the rules of the international game. The US hopes to bring China around through its relationships with Japan, South Korea and India. Towards that end, Asia must have a balance of power. The US initiative to help India to develop itself as a world class power is related to the creation of this balance of power in Asia in which all major economies will be interactively engaging with and not containing or confronting China.

A more powerful nation helping a less powerful nation to build itself, happens when the more powerful nation calculates that the end result would be to its advantage. At the end of the 19th Century, Britain transferred technology to Japan and invested heavily there to build Japan as a counter balance to Czarist Russia. Similarly, at the end of the Second World War, both Germany and Japan were recipients of US aid. They became security partners of the US. All the East Asian tigers became strong because of massive US support. In the 1950s China received massive aid for its industrialisation from the Soviet Union.

Building Up India

India's record of accepting military and developmental aid from other countries and yet maintaining its independence speaks for itself. There were those who denounced the Indo-Soviet Treaty of 1971 as having made India a Soviet satellite. There were others who argued that Soviet help was going to trap India to join Brezhnev's anti-China security arrangement. Both those assessments proved wrong. Many oppose present Indo-American co-operation. Underlying this timidity is an exaggerated fear of the US as the sole superpower. To think of the US as an all-powerful superpower able to impose its will on the rest of the world on every issue is a continuation of the Cold War mindset and does not represent the reality of today. Many in India have not grasped this point, but the US leadership appears to have done so.

The Americans have done their homework. To stay competitive in business, they need three things. First, increasing amount of brain power that could sustain American inventiveness; second, an ability to cut costs through outsourcing; third, a large market.

The emphasis is on India as a rising economic power, a potential third market of the world and a reservoir of brain power available to be tapped. Those who argue about the hidden costs in the American offer have a valid point. But they should not stop at just raising fears and walking away. They should try and spell this out in long and short terms. Our attempt should be to have an objective assessment of the US offer and to carry out a calculated cost-benefit analysis on it.

Let us do an elementary assessment of the global balance of power some three decades from now. China will have overtaken the US in terms of aggregate Gross Domestic Product (GDP). Unless China becomes democratic it will face uncertainties and instability. India will be the most populous country in the world and be comparatively younger than China in age profile. In terms of skilled manpower generation India will have an advantage. It is also likely that the Indian population in the US will be many times what it is today and in all possibilities will have commensurate political clout. As the US and China compete for a pre-eminent position, India as a third market power and the largest reservoir of scientific talent will be in a significant position to influence the result. In India, this issue has not been fully understood.

During the Cold War, the US applied pressure on India through support to Pakistan. Today, all political parties in the US want to lead Pakistan towards becoming a moderate Islamic state. General Musharraf is considered necessary for this policy. Though Pakistan has not yet dismantled its terrorist infrastructure, the US policy is committed to a reduction in cross border terrorism in Jammu and Kashmir and secessionists can no longer look for the US support. In the present situation the US needs Musharraf for its war on terrorism just as our Central Government needs tainted politicians to sustain its majority in Parliament. The US is offering a measure of defence co-operation with India which will in a few years leave Pakistan far behind. Musharraf knows that the changes occurring on the international scene are reducing Pakistan's utility for the US global strategy

Many warn that the US is a hegemonic power and India can never have an equal partnership with it. There is no denying that the US has been a hegemonic power for the past six decades. But the arguments advanced so far have demonstrated that the system

is changing fast. The US will have to accept the discipline of a global balance of power and a more norm-based international system in future. Iraq is as much a new beginning for the US as it is for the authoritarian Islamic states. Anyway, the US is more of a liberal democracy in its domestic policies than other major powers including India. Those who talk of hidden costs involved in accepting the US initiative forget the past. India was able to resist the entire international pressure between 1990 and 1998 when the US was all powerful. Since then, India has become a stronger economic and political power and has developed new linkages. There is no way that India can be made to accept discriminatory controls over its nuclear or missile programmes. The US offer of civil nuclear aid to India is related to President Bush's conviction that energy requirements of the US, China and India cannot be met in the future on the basis of hydrocarbon solutions.

Will US Initiatives Continue?

One cannot rule out the possibility of China moving towards democracy. If this were to happen, the US will nevertheless try to maintain its pre-eminence and mobilise Indian help for that purpose. Some speak of millennia-old friendship with China in the hope that it will prompt India to lean towards China on the basis of Asian solidarity. In the coming years there will be a few million Indians in the US. This factor will tilt India in favour of the US. Indians would prefer a pre-eminent US to a pre-eminent China.

Will the US initiative towards India succeed? The US policy has two components: to tap Indian brain power and mobilise Indian skills and ensure US competence and inventiveness. If India does not respond officially to this initiative, the US will deal directly with Indian companies, universities and individuals. Will this initiative survive the Bush Administration? There is likely to be a political battle within America between those who look at outsourcing from the short-term populist point of view and those who take the long-term view. Pro-Chinese lobbies in the US, and anti-US lobbies within India may raise objections and campaign against the policy. You can be sure that the bureaucracies and Cold War warriors in Delhi and Washington will keep trying to block the two countries from arriving at a satisfactory agreement to both sides. Ultimately the result will depend upon the two political leaderships and business communities.

Impact of Domestic Economic Influences on Indo-US Relations

Lieutenant Colonel Vivek Chadha

India's economic metamorphosis began in 1991, with the Narasimha Rao government coming to power and its Finance Minister Manmohan Singh, introducing a series of economic reforms, which transformed India. Within a span of five years India, from endlessly remaining a potential economic power reached the threshold of economic boom. The Gross Domestic Product (GDP) saw a quantum jump from three per cent to more than double the rate per annum. Foreign Direct Investment (FDI) increased, as opportunity and potential were unleashed. Most importantly, liberalisation of the economy and growing competition witnessed Indian companies taking on global brands and gaining in self-confidence. This reflected in the zeal to carry business across continents to earn revenue and repute. Simultaneously, the jump-start of the economy also created more funds, for infrastructure development and social welfare with dependence on foreign loans reducing.

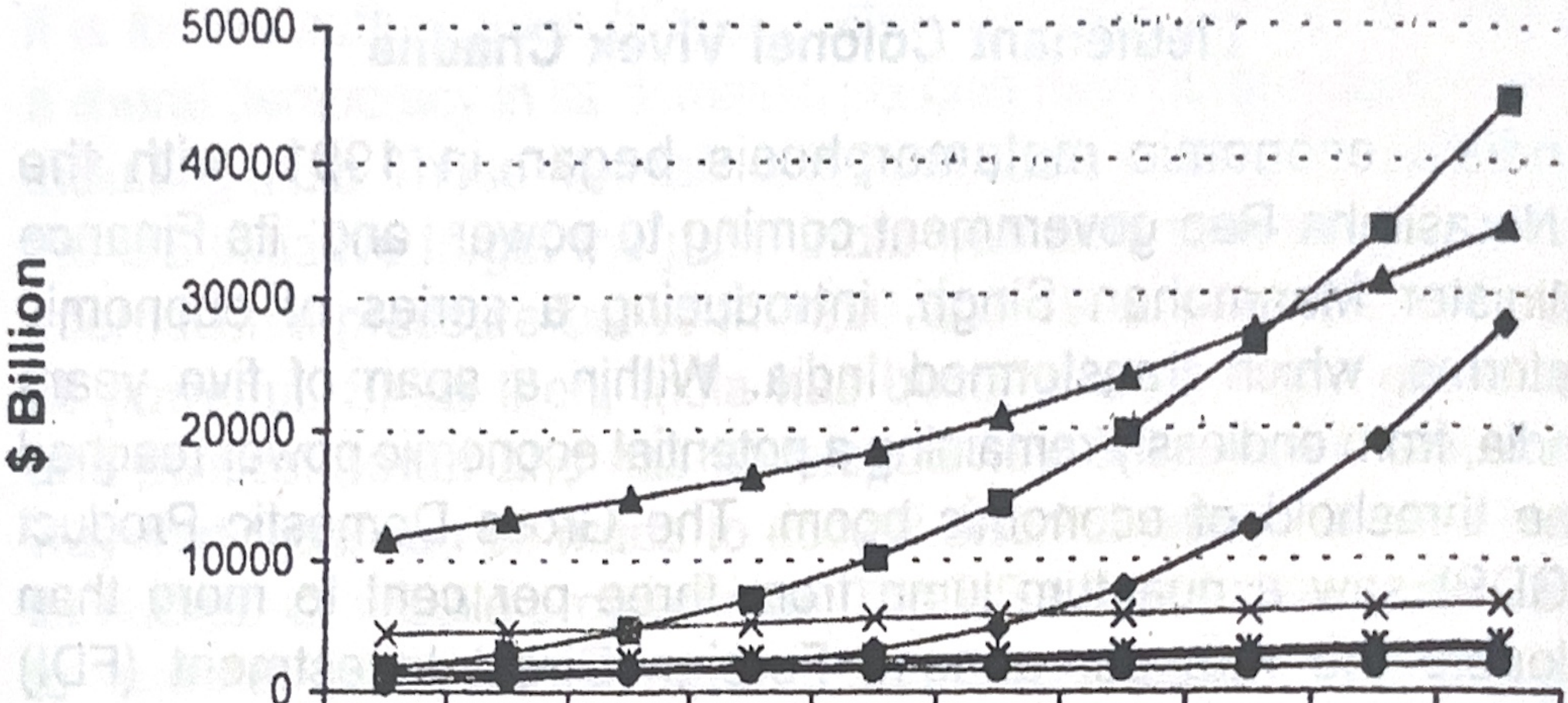
A study of the long term perspective of the Indian economy will reveal certain trends, potentials and weaknesses, which will give indicators of how and where these realities are likely to influence the economic policies of the United States as well as business groups in that country. This is especially relevant with respect to how India's economic prowness is perceived, dividends provided, and potential and benefits of FDI and scope for trade enhanced. All this is likely to be influenced by the environment, infrastructure development, relative spending potential of the population over the years, opportunities and avenues and the knowledge base to translate potential US technology and skills.

Lieutenant Colonel Vivek Chadha is Staff Officer to the Chief of Army Staff.

Journal of the United Service Institution of India, Vol. CXXXVI, No. 563, January-March 2006.

Table 1

GDP Growth ($US billion)



	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
India	604	929	1411	2104	3174	4935	7854	12367	18847	27803
China	1724	2998	4754	7070	10213	14312	19605	26439	34799	44453
United States	11697	13271	14786	16415	18340	20833	23828	27229	30956	35165
Japan	4427	4601	4858	5221	5567	5810	5882	6039	6297	6673
Germany	2011	2212	2386	2524	2604	2697	2903	3147	3381	3603
Italy	1236	1337	1447	1553	1625	1671	1708	1788	1912	2061
France	1489	1622	1767	1930	2095	2267	2445	2668	2898	3148

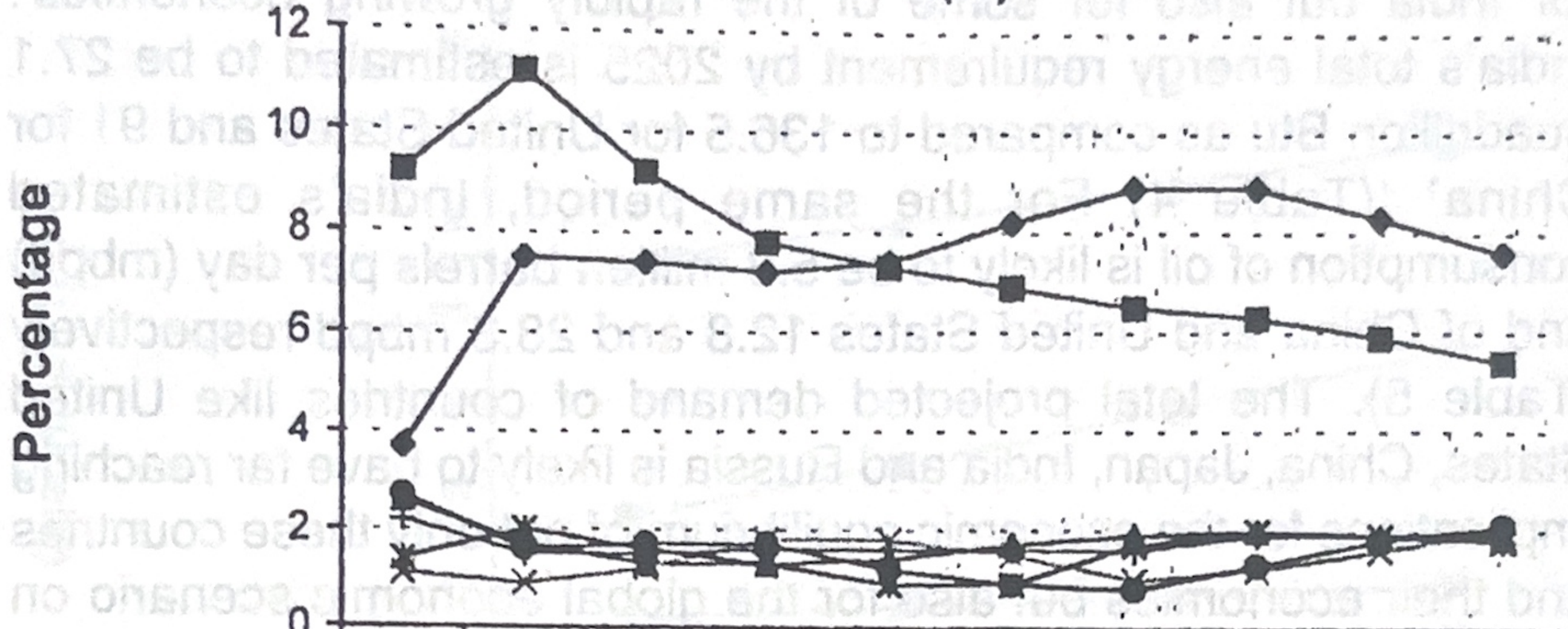
(Goldman Sachs : Global Economics Paper No: 99, 1 October 2003)

Indian Economy in Long Term Perspective

India's GDP growth assessed by a Goldman Sachs paper makes revealing study. From rate of US $604 billion in 2005, it is likely to rise to US $4395 in 2030 and US $27803 by 2050 (Table 1). The paper also compares India's development with other major countries with a similar growth potential. These include Brazil, Russia, India and China (BRIC). This phenomenal rise when compared to other important economies will make India the third largest economy by 2032. India will also have the highest rate of growth over a long-term perspective of 30 to 50 years (Table 2). It is also revealing to note that the combined purchasing pattern of the BRIC countries is likely to outstrip the G6 as early as 2009, with projections in subsequent years clearly pointing to phenomenal markets in these countries of which China and India are likely to retain the major share for spending (Table 3).

Table 2

GDP Growth (%)

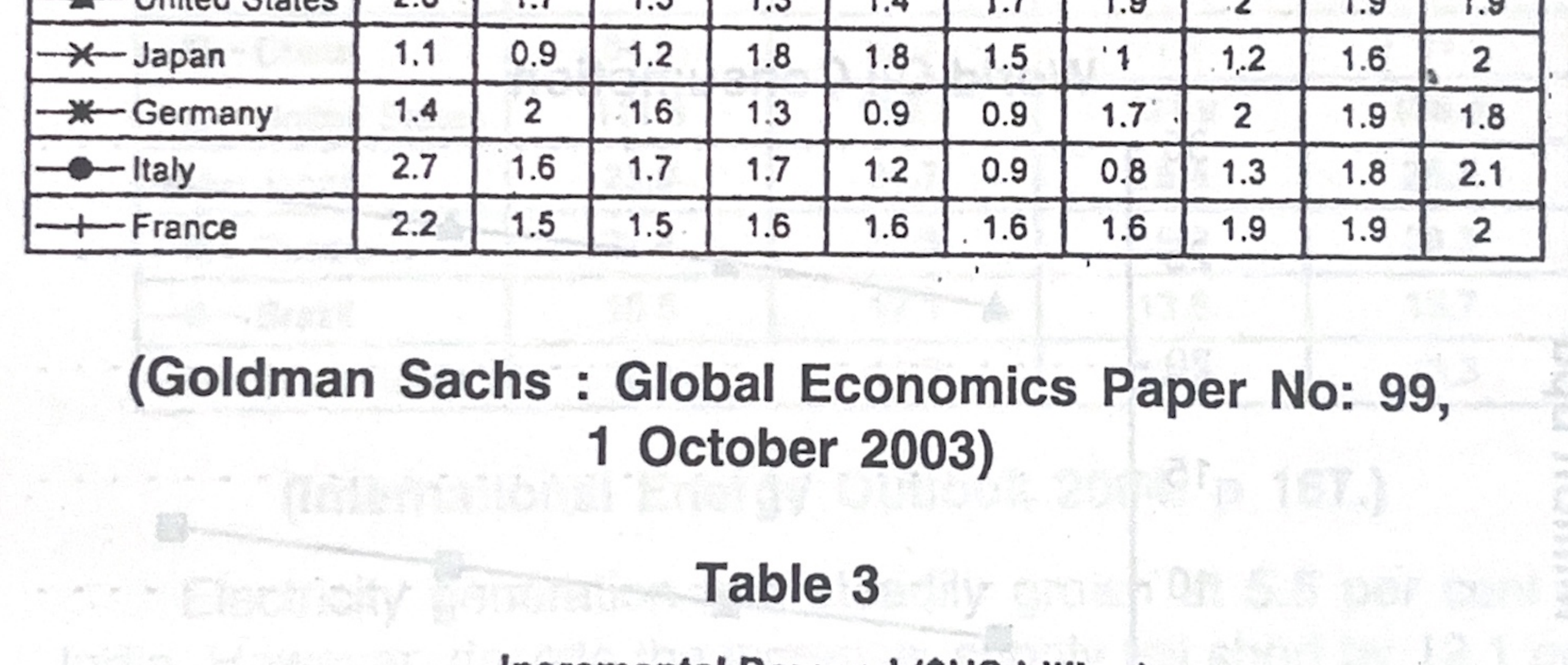


	2000-05	2005-10	2010-15	2015-20	2020-25	2025-30	2030-35	2035-40	2040-45	2045-50
India	3.7	7.5	7.4	7.2	7.4	8.2	8.9	8.9	8.3	7.6
China	9.2	11.2	9.2	7.8	7.3	6.9	6.5	6.3	5.9	5.4
United States	2.6	1.7	1.3	1.3	1.4	1.7	1.9	2	1.9	1.9
Japan	1.1	0.9	1.2	1.8	1.8	1.5	1	1.2	1.6	2
Germany	1.4	2	1.6	1.3	0.9	0.9	1.7	2	1.9	1.8
Italy	2.7	1.6	1.7	1.7	1.2	0.9	0.8	1.3	1.8	2.1
France	2.2	1.5	1.5	1.6	1.6	1.6	1.6	1.9	1.9	2

(Goldman Sachs : Global Economics Paper No: 99, 1 October 2003)

Table 3

Incremental Demand ($US billion)



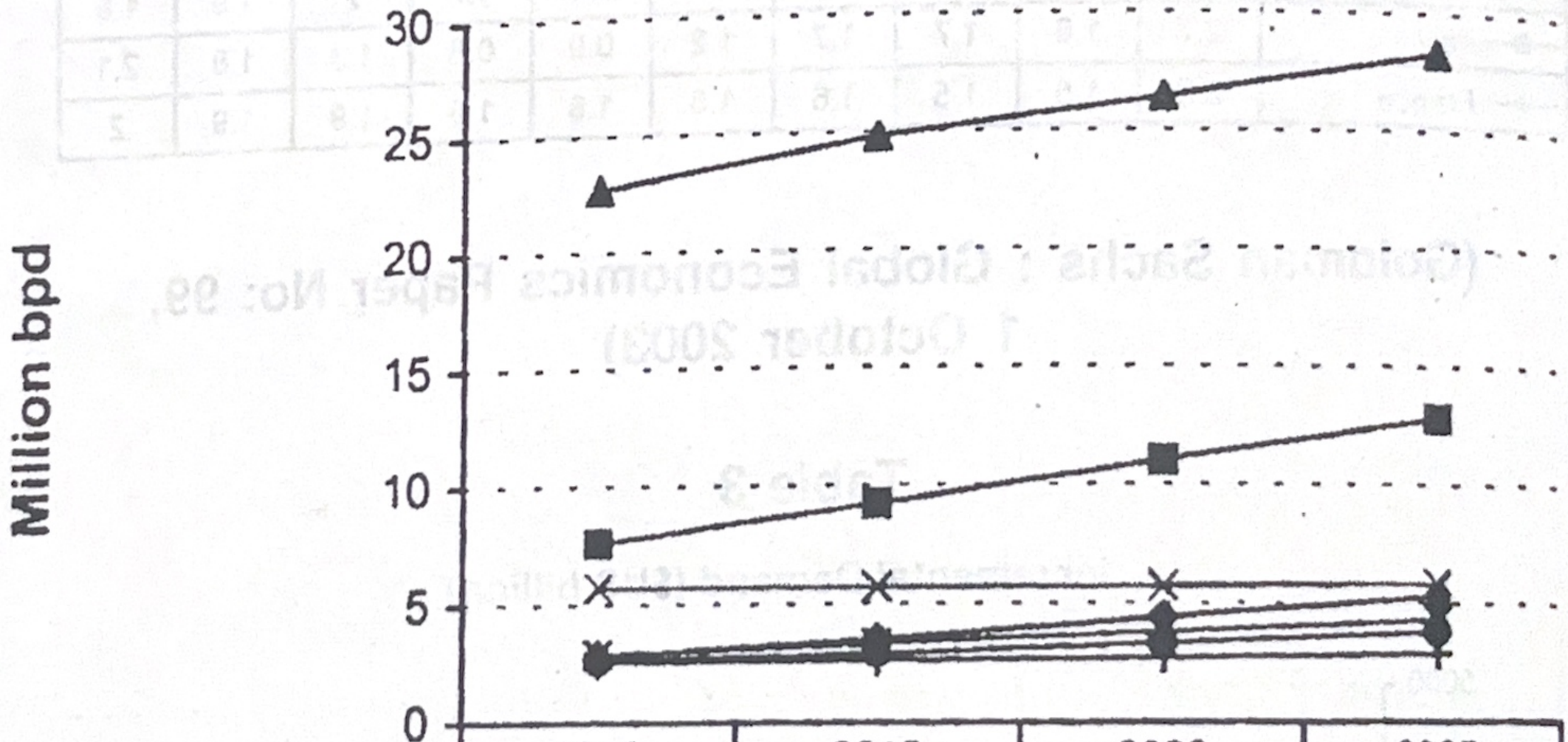
	2010	2030	2050
BRICs	521	1594	4517
G6	470	656	1137

Note : BRICs - Brazil, Russia, India and China.
G6 - USA, UK, France, Germany, Italy and Japan.
(Goldman Sachs: Global Economics Paper No: 99)

It is apparent from these basic economic parameters, that there 'will be a substantial enhancement in energy needs not only for India but also for some of the rapidly growing economies'. India's total energy requirement by 2025 is estimated to be 27.1 quadrillion Btu as compared to 136.5 for United States and 91 for China[1] '(Table 4) For the same period, India's estimated consumption of oil is likely to be 5.3 million barrels per day (mbpd) and of China and United States 12.8 and 28.3 mbpd respectively (Table 5). The total projected demand of countries like United States, China, Japan, India and Russia is likely to have far reaching implications for the economic equilibrium of not only these countries and their economies but also for the global economic scenario on a monumental scale.

Table 4

World Oil Consumption

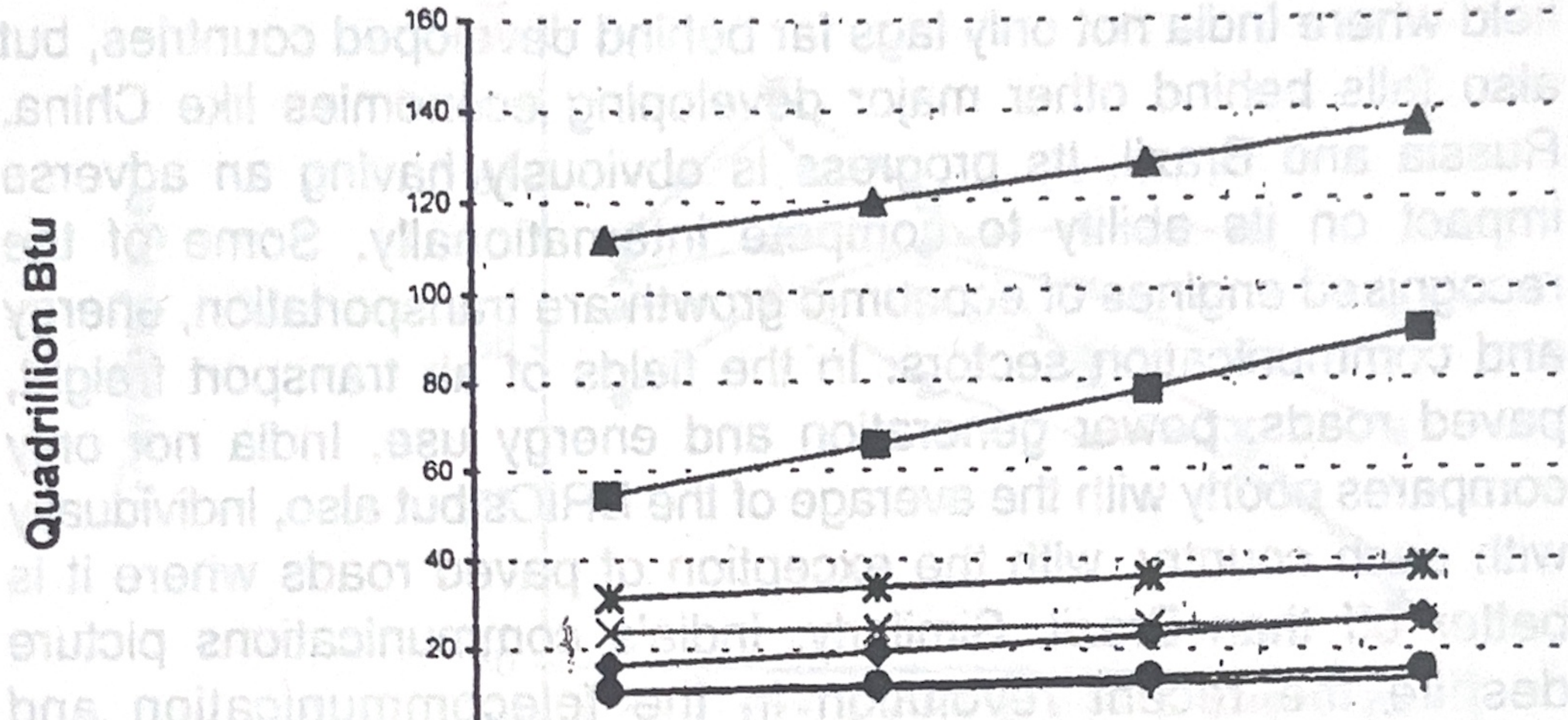


	2010	2015	2020	2025
India	2.8	3.5	4.4	5.3
China	7.6	9.2	11	12.8
United States	22.7	24.8	26.4	28.3
Japan	5.7	5.7	5.7	5.8
Russia	2.9	3.3	3.8	4.3
Brazil	2.6	2.9	3.3	3.8
South Korea	2.5	2.6	2.7	2.9

(International Energy Outlook 2004: p 164.)

Table 5

Total Primary Energy Consumption



	2010	2015	2020	2025
India	16.4	19.5	23.2	27.1
China	54.6	65.7	77.7	91
United States	111.8	119.7	127.9	136.5
Japan	23.9	24.7	25.4	26.3
Russia	31.4	33.8	36.2	38.3
Brazil	10.5	12.1	13.8	15.7
South Korea	10.1	11.3	12.3	13.3

(International Energy Outlook 2004: p 167.)

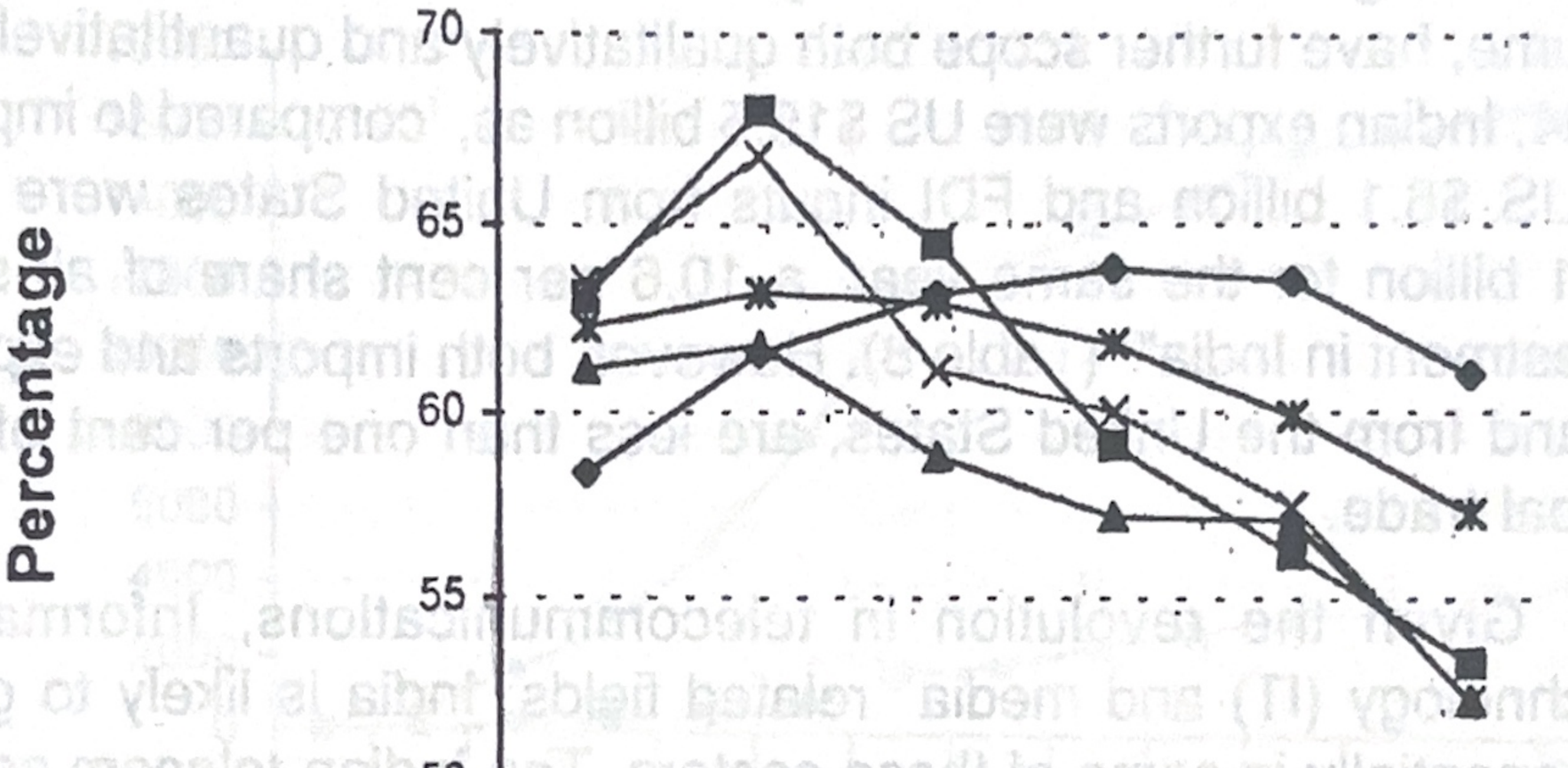
Electricity generation has steadily grown at 5.5 per cent in India. However, despite the increase, supply fell short by 12.1 per cent for the financial year 2004-05.[2] According to the *Economic Times*, this shortfall is likely to further increase as demand in the rural areas catches up from the measly average of 526 units kilowatt-hours per year and a - meagre 13 per cent of all electricity consumed in the country. In 2005, "56 per cent of India's households, and just 44 per cent of those in rural areas, have connections to the grid."[3] The country plans to double its generation capacity in the next ten years to ensure that it can sustain the impressive growth rate of over six per cent that has been sustained for over fifteen years. This is a major challenge for the Indian economy if it has to sustain its ongoing momentum and remain attractive to foreign investment and capital. It is also an attractive market for renewable energy sources and nuclear energy.

It is evident from models of most modern countries that economic progress of both individuals and countries is closely tied with the degree of development of basic infrastructure. This is one field where India not only lags far behind developed countries, but also falls behind other major developing economies like China, Russia and Brazil. Its progress is obviously having an adverse impact on its ability to compete internationally. Some of the recognised engines of economic growth are transportation, energy and communication sectors. In the fields of air transport freight, paved roads, power generation and energy use, India not only compares poorly with the average of the BRICs but also, individually with each country, with the exception of paved roads where it is better off than Brazil. Similarly, India's communications picture despite the recent revolution in the telecommunication and information technology sector does-not compare well with the other three BRIC countries.[4] It is expected that India is likely to experience a major growth in these fields with substantive initiatives in progress in all these sectors.

Yet another factor, which will influence growth of economy and increasing opportunities within and outside the country is the availability of manpower in the working age group. In this field, India is likely to take the lead with a consistently increasing pool of manpower availability both in terms of percentages as well as sheer numbers (Table 6). It takes a mere look at the percentages, and more importantly, at the total population to get an idea about the number of people likely to be available in India, which will undoubtedly make up for the deficiencies in other major countries (Table 7). According to demographer A R Nanda, by year 2020; "the US would be short of 17 million people in working age, China of 10 million, Japan nine million and Russia six million. Indians would then be absorbed into some of these economies."[5] When this is seen in relation to the "2.5 million IT, engineering and life sciences graduates a year, besides about 650,000 post graduates in science"[6], the perspective becomes clearer.

Table 6

Working Population (%)

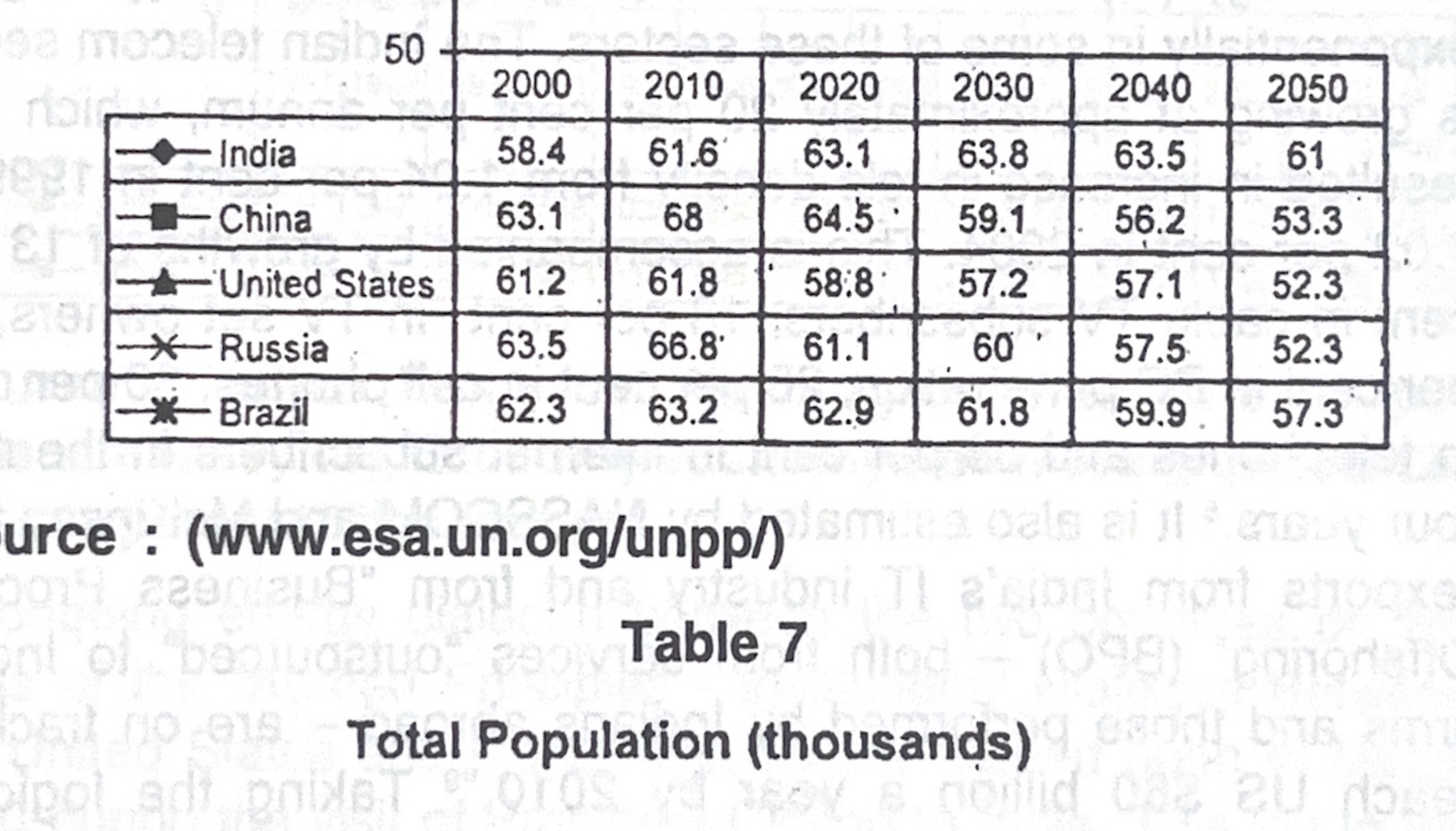


	2000	2010	2020	2030	2040	2050
India	58.4	61.6	63.1	63.8	63.5	61
China	63.1	68	64.5	59.1	56.2	53.3
United States	61.2	61.8	58.8	57.2	57.1	52.3
Russia	63.5	66.8	61.1	60	57.5	52.3
Brazil	62.3	63.2	62.9	61.8	59.9	57.3

Source : (www.esa.un.org/unpp/)

Table 7

Total Population (thousands)



	2000	2010	2020	2030	2040	2050
India	1021084	1183293	1332032	1449078	1534402	1597734
China	1273979	1354533	1423939	1446453	1433431	1392307
United States	284154	312253	338427	360894	379544	394976
Russia	146560	140028	133101	125325	118334	111752
Brazil	173858	198497	219193	235505	246766	253105

Source : (www.esa.un.org/unpp/)

Indo-US Economic Relationship and Prospects

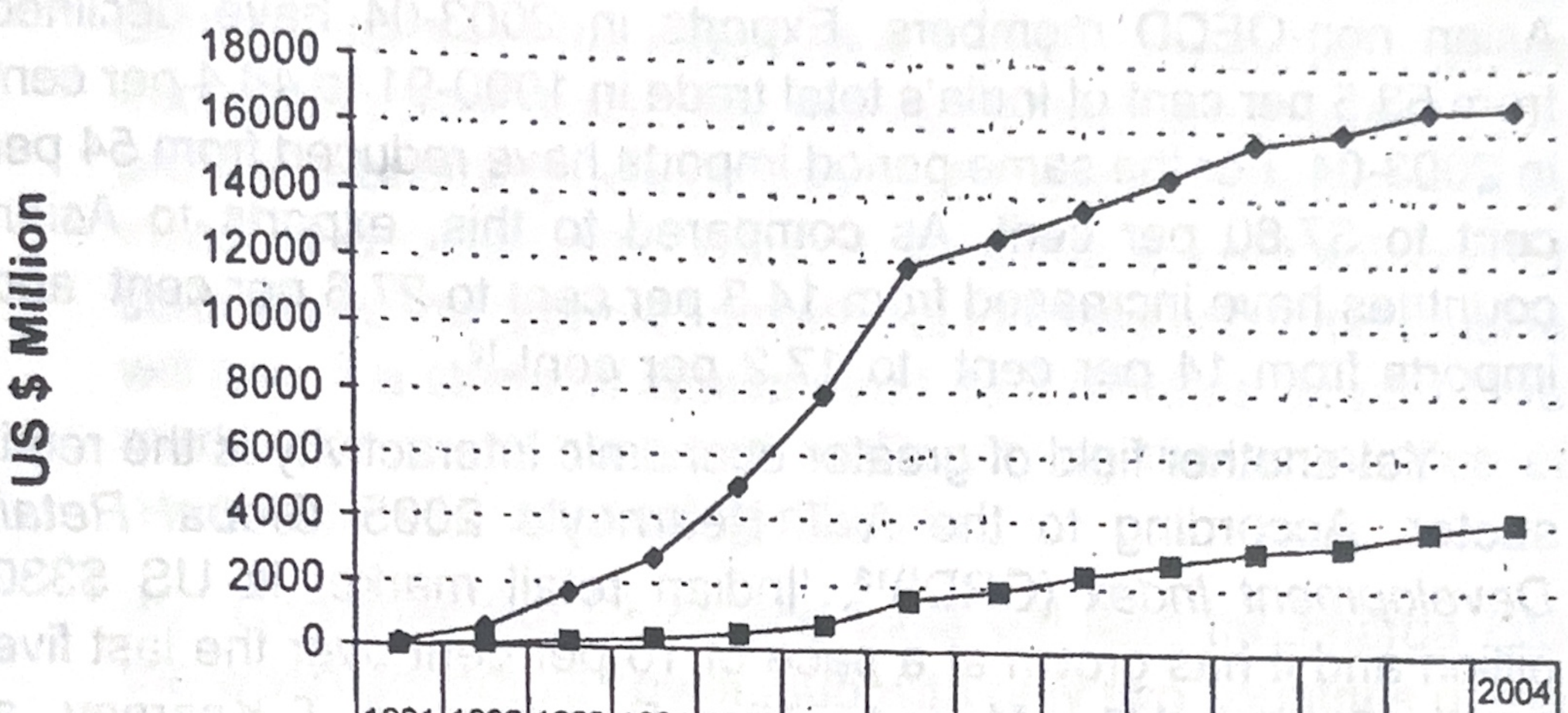
Specifically, with regard to relations with the United States, the existing levels of trade though, substantially better in terms of volume, have further scope both qualitatively and quantitatively. In 2004, Indian exports were US $15.5 billion as, 'compared to imports of US $6.1 billion and FDI inputs from United States were "US $4.1 billion for the same year, a 10.6 per cent share of all such investment in India"[7] (Table 8). However, both imports and exports to and from the United States, are less than one per cent of US global trade.

Given the revolution in telecommunications, Information Technology (IT) and media related fields; India is likely to grow exponentially in some of these sectors. The Indian telecom sector is growing at approximately 20 per cent per annum, which has resulted in increase in tele-density from 1.94 per cent in 1999 to 7.02 per cent in 2004. This is accompanied by growths of 13 per cent in cable TV subscribers, 18 per cent in TV set owners, 27 per cent in PC penetration, 28 per cent in cell phones, 30 per cent in telephones and 58 per cent in internet subscribers in the next four years.[8] It is also estimated by NASSCOM and McKinsey that "exports from India's IT industry and from "Business Process Offshoring" (BPO) – both from services "outsourced" to Indian firms and those performed by Indians abroad – are on track to reach US $60 billion a year by 2010."[9] Taking the logic of outsourcing further, the *Economist* claims, "India's fundamental attraction has not changed since it drew software developers: fantastic cost savings. With American lawyers costing US $300 per hour or more, Indian firms can cut the bills by 75 per cent.[10] These figures are indicative of both a burgeoning market as well as an improvement in some of the infrastructure areas like telecommunications and IT at a feverish pace. The present thrust of the US investments in India has been in the field of fuels (35.93 per cent) telecommunications (10.56 per cent) electric equipment including software (9.5 per cent), food processing (9.43 per cent), and the service sector, finance and non-finance (8.28 per cent).

However, the future holds a lot of promise in the fields of software development, telecommunications, infrastructure and knowledge based industries like pharmaceuticals and biotechnology. The power sector has also been opened up for foreign investment and there is a concerted thrust towards increasing the share of cleaner energy sources, which has led to

Table 8

YEARWISE CUMULATIVE FDI



	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004 till Aug
Approved	76	547	1676	2788	5035	7908	1178	1268	1353	1451	1560	1603	1671	1685
Inflow	11	55	203	322	537	808	1545	1892	2323	2742	3109	3392	3788	4133

(Source : Indian Embassy Washington Web Site) http://indianembassy.org/Economy/economy.htm#Foreignpercent20Directorpercent20Investment

an ongoing energy dialogue between the two countries on the basis of the "Agreed Principles - Institutional Dialogue Between the United States and India," which were agreed upon in March 2000 during the visit of President Clinton to India. This led to the establishment of a "High Level Coordinating Group," which included the US-India Financial and Economic Forum, US-India Commercial Dialogue and the US-Indian Working Group on Trade. One of the important provisions it provided for was the setting up of a Joint Consultative Group on Clean Energy and Environment. This has received a boost after the announcement of likely co-operation in the field during the landmark announcement on 18 July 2005, which highlighted American interest in assisting India in the field of nuclear power generation for civil use.

There has also been a marked increase in trade, between India and the United States in the recent years. In 2004, exports from India grew by 18.37 per cent to US $14.328 billion whereas for the same period imports grew by 22.73 per cent to US $5.532 billion. However in comparative terms when seen in perspective of the exponential growth of Indian trade with China, which rose from US $5 billion to US $13.6 billion from 2002 to 2004; a degree of

cautious enthusiasm needs to be maintained. Trade with Organisation for Economic Co-operation and Development (OECD) countries has shown a downward trend when compared with Asian non-OECD members. Exports in 2003-04 have declined from 53.5 per cent of India's total trade in 1990-91 to 46.4 per cent in 2003-04. For the same period imports have reduced from 54 per cent to 37.80 per cent. As compared to this, exports to Asian countries have increased from 14.3 per cent to 27.6 per cent and imports from 14 per cent to 17.2 per cent.[12]

Yet another field of greater economic interactivity is the retail sector. According to the A T Kearney's 2005 *Global Retail Development Index* (GRDI)[13], 'Indian retail market is US $330 billion and it has grown at a pace of 10 per cent over the last five years. Quoting Mike Moriarty, Vice President, A T Kearney, a news report stated, "The message for retailers on India is clear: move now or forego prime locations and market positions that will become saturated ,quickly," It added, "Global retailers that missed opportunities to capture first-mover advantage in China can make up for it in India."[14] However, it is important to keep in mind that irrespective of India's increased trade with China, "Wal-Mart's supply chain pulled in US $ 18 billion worth of goods in 2004 from five thousand Chinese suppliers."[15] The Chinese spokesman of Wal--Mart added, "If Wal-Mart were an individual economy, it would rank as China's eighth--biggest partner, ahead of Russia, Australia and Canada."[16] This is the reality that India needs to pitch its standards against.

The last factor is not economic in essence, yet in practice it has had a greater impact than some others. India and some regions in the United States have an almost 12 hour difference in their time cycles. This has worked to the benefit of India as it gave the opportunity to exploit any 24 hour cycle to the optimum between the two countries. When combined with the strength of India's knowledge based service industry and the knowledge of English, this has helped fuel economic inter dependence and growth in a unique manner.

Conclusion

The basic facts bring out some very interesting conclusions, which are likely to impact Indo-US relations. These are:

(a) China's phenomenal GDP growth along with some other fast growing economies of the world like India, Brazil and

Russia will be watched closely by the United States. This growth, when translated into economic possibilities highlight issues of rise of China as an economic counterpoise to United States in terms of the influence it is likely to wield as a global economic power. It also has the vast potential for participative profit in a booming economy for global companies planning to invest and outsource. Thus, it presents a contradiction of sorts where the growing influence of Chinese economic muscle will give it a strategic impact even as it remains an attractive market for investment and profit, driving the economies of developed and developing markets.

(b) Countries like China and India will lead the charge into the world economic power club with only two countries of the present G-6, United States and Japan figuring in the list by 2050, making Asia the hub of economic growth. This is likely to lead to growing competition for economic space, advantage and leverage between major developed countries like the United States and Japan and emerging countries like China and India unless complementary symbiotic growth continues to fuel economies as prevalent in the existing scenario.

(c) Though there may be differences in strategic perspective between major powers to include United States, China, Japan and India, yet economic compulsions in terms of need for investment, technology and business in developed countries and markets, cheap outsourcing and offshore practices in fast developing economies, have ensured a closely interlinked relationship, which is proving to be a win-win situation for all countries. This is borne by the fact that both India and China have positive trade surpluses with the United States. Simultaneously, it has improved the profitability of companies in Japan and America who have benefited because of advantages offered in services and a competitive production base.

(d) There is likely to be a substantial growth of Indo-US trade as is indicative by the trends available. However, the pace, is likely, to be influenced by, appreciation of the mutual benefits of the relationship, resolution of contentious issues like property rights, tariffs and further liberalisation of the Indian economy.