Defense

The Indian Defense Industry – Market Opportunities, Entry Strategies, Analyses and Forecasts to 2016

Reference code: DF0075MR

Published: November 2011

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1 Introduction

1.1 What is this Report About?

This report offers insights into the market opportunities and entry strategies adopted by foreign OEMs (original equipment manufacturers) to gain a market share in the Indian defense industry. In particular, it offers an in-depth analysis of the following:

- **Market opportunity and attractiveness:** detailed analysis of the current industry size and growth expectations during 2011–2016, including highlights of the key growth stimulators. It also benchmarks the industry against key global markets and provides detailed understanding of emerging opportunities in specific areas.
- **Procurement dynamics:** trend analysis of imports and exports, together with their implications and impact on the Indian defense industry.
- **Industry structure:** five forces analysis to identify the various power centers in the industry and how these are expected to develop in the future.
- **Market entry strategy:** analysis of possible ways to enter the market, together with detailed descriptions of how existing companies have entered the market, including key contracts, alliances and strategic initiatives.
- **Competitive landscape and strategic insights:** analysis of the competitive landscape of the defense industry in India. It provides an overview of both domestic and foreign key defense companies, together with insights such as key alliances, strategic initiatives and a brief financial analysis.
- **Business environment and country risk:** a range of drivers at country level, assessing business environment and country risk. It covers the historical and forecast values for a range of indicators, evaluating business confidence, economic performance, infrastructure quality and availability, labor force, demographics, and political and social risk.

1.2 Definitions

For the purposes of this report, the following timeframes apply:

- **Review period:** 2005–2010
- **Forecast Period:** 2011–2016

The following are definitions of military expenditure:

- **Revenue expenditure:** includes troop training, institutional education, construction and maintenance of various undertakings. It also covers the salaries, allowances, pensions, transportation, food, insurance, welfare benefits and miscellaneous expenditures pertaining to all unit allowances for training, contingency and other grants for officers, non-commissioned officers, enlisted men and contracted civilians.
- **Capital expenditure (capex):** covers research and development (R&D), procurement, maintenance, transportation and storage of weaponry and other equipments. It also includes expenditure on aircraft and aero engines, heavy and medium vehicles, naval equipment and expenditure on the purchase of land, construction, plants and machinery
- **Total defense expenditure:** includes administrative and maintenance related functions such as salary, buying spares, general stores, food, medical stores and other supplies.

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The following are definitions of defense categories:

- **Military hardware:** refers to the broad range of machinery, systems, equipment and weapons used by defense forces.
- **Air defense systems:** are defined as all measures designed to nullify or reduce the effectiveness of hostile air action. They include ground- and air-based weapon systems, associated sensor systems, command and control arrangements and passive measures. This may be to protect naval, ground and air forces wherever they are positioned, but does not include the missile defense system.
- **Missile defense systems:** are systems, weapons or technologies involved in the detection, tracking, interception and destruction of attacking missiles.
- **Naval defense systems:** are used to protect sea lanes and ferry troops, or to attack other navies, ports or shore installations. It includes surface ships, amphibious ships, submarines, and seaborne aviation.
- **Homeland security (HLS):** involves the protection of a country's civilians and critical infrastructure from natural or man-made disasters. Its margins extend to border and maritime patrol, customs checks in ports and airports, search and rescue operations, disaster recovery, combating terrorism and cyber attacks.

The following are miscellaneous definitions:

- **Indirect offsets:** involve both barter and counter trade deals, investment in the buying country, or the transfer of technology unrelated to the weapons being sold.
- **Direct offsets:** is defined as an arrangement in which the purchaser receives work or technology directly related to the weapons sale, typically by producing the weapon system or its components under license.
- **Multipliers:** are additional credits assigned over and above the market value provided to offsets for a technology, product or service being offered.
- **Command, control and communications and intelligence system (C3I):** refers to an information system employed by a military's top command to direct its forces. This system provides the military with information on various parameters associated with executing a strategy during a military exercise. The parameters include reconnaissance and surveillance, troop positions, inventory levels and weather conditions. The communication system enables the transfer of images and videos captured by surveillance systems and data and voice between the command and control center. In addition, the system aids in joint operations between the army, navy and air force.
- **Maintenance, repair and overhaul (MRO):** involves the servicing of a defense system with the objective of restoring it to a state where it can perform its intended function. It could be routine maintenance, replacement of faulty spare parts or checking the entire system to ensure smooth functioning.
- **Airborne early warning and control systems (AEW&C):** are airborne radar systems used by the military to detect the movement of aircraft in its airspace. Used at high altitudes, they are used in both defensive and offensive air operations and have the ability to help distinguish between civilian and military aircraft.

1.3 Methodology

ICD Research's dedicated research and analysis teams consist of experienced professionals with a background

in industry research, and consulting in the defense sector. The following research methodology is followed for all databases and reports.

1.3.1 Secondary research

The research process begins with exhaustive secondary research to source reliable qualitative and quantitative information related to the defense market. The secondary research sources that are typically referred to include, but are not limited to:

- Industry associations
- National government documents and statistical databases
- Company websites, annual reports, financial reports, broker reports and investor presentations
- Industry trade journals and other literature
- Internal and external proprietary databases
- News articles, press releases and webcasts specific to the companies operating in the market

1.3.2 Primary research

ICD Research Intelligence conducts hundreds of primary interviews a year with industry participants and commentators in order to validate its data and analysis. A typical research interview fulfils the following functions:

- Provides first-hand information on market size, market trends, growth trends, competitive landscape and future outlook.
- Helps to validate and strengthen secondary research findings.
- Further develops the analysis team's expertise and market understanding.

Primary research involves e-mail interactions, telephonic interviews and face-to-face interviews for each market category, division and sub-division across geographies.

The participants who typically take part in such a process include, but are not limited to:

- Industry participants: CEOs, VPs, business development managers, market intelligence managers and national sales managers.
- External experts: investment bankers, valuation experts, research analysts and key opinion leaders specializing in defense markets.

1.3.3 Conventions

- Currency conversions are performed on the basis of average annual conversion rate format calculations.
- All the values in tables, with the exception of compounded annual growth rate (CAGR) and compounded annual rate of change (CARC), are displayed to one decimal place. As such, growth rates may appear inconsistent with absolute values due to this rounding method.

1.4 ICD Research Intelligence Terrorism Index

The ICD Research Intelligence Terrorism Index classifies countries across the world into one of the following categories based on the risk of terrorism:

- Worst affected
- Highly affected

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- Moderately affected
- Some risk
- Low risk

It takes into account the total number of terrorist incidents, the total number of people affected by these attacks, and the presence of foreign terrorist organizations in a country. Based on these parameters, the terrorism index is developed using a weighted average scorecard.

1.5 About ICD Research

ICD Research is a full-service market research agency and premium business information provider, specializing in industry analysis in a broad set of B2B and B2C markets. Our products and services help companies make better decisions, win business and position themselves more effectively.

ICD Research's areas of expertise include online research, qualitative and quantitative research, industry analysis, custom approaches, and actionable insights. ICD Research has access to over 500 in-house analysts and journalists, and a global media presence in over 30 professional markets, enabling us to conduct unique and insightful research via our trusted business communities.

1.6 About Strategic Defence Intelligence (www.strategicdefenceintelligence.com)

This report is one of a series that is available to subscribers of our premium research platform: Strategic Defence Intelligence. Strategic Defence Intelligence provides a stream of continuously updated customer and competitor intelligence as well as detailed research reports providing an unrivalled source of global information on the latest developments in the defence industry.

Strategic Defence Intelligence's unique monitoring platform tracks global defence activity for over 2,500 companies and 65 product categories in real-time in a highly structured manner; giving a comprehensive and easily-searchable picture of all defence industry activity. The site features daily updated analysis, comment and news, company and customer profiles, defence spending, tenders and contracts, product and technology intelligence, a research and analysis database giving you access to industry and competitor reports to inform you business and market planning, as well as fully customisable tools including instant personalised report generation and custom alerts.

For a free demonstration please contact us at: sales@strategicdefenceintelligence.com

2 Executive Summary

India has one of the fastest-growing global defense markets and is expected to spend approximately US$304.7 billion during the forecast period

The Indian defense industry is one of the fastest-growing global defense markets. India's defense capital expenditure, which refers to the part of the defense budget that is spent on the acquisition of all types of military hardware and technology, has grown at a CAGR of 12.25% over the review period. In 2010, India was allocated US$13.1 billion for defense capital expenditure in the budget. Defense expenditure is expected to record a CAGR of 13.08% during the forecast period, to reach an annual expenditure of US$67.8 billion by 2016. This is primarily due to the country's ageing military hardware and technology which is in need of replacing, and demands for defense against domestic insurgencies and hostility from neighboring countries. The strong growth in the industry is attracting foreign original equipment manufacturers (OEMs) and leading companies from the domestic private sector to enter the market. Moreover, terrorism is leading to sharp increases in the defense budget and a shorter sales cycle, which offers an attractive market for defense manufacturers.

The country is especially expected to demand unmanned combat aerial vehicles (UCAVs), advanced electronic warfare systems, combat systems, rocket and missile systems, fighter and trainer aircraft, stealth frigates, and submarines during the forecast period. In addition, its expenditure on IT and communications is expected to increase significantly, with a strong focus on enterprise applications, systems integration, and real-time mobile communications.

The country relies upon imports to procure defense equipment with advanced technology, and, since most of the equipment India is seeking use advanced technology, there will be a significant prospect for foreign OEMs to enter the Indian defense market.

The Indian homeland security budget reached US$5.8 billion in 2010

Government spending on India's homeland security market has increased significantly as a result of terrorist attacks, the smuggling of arms and explosives, and domestic insurgency. In 2010, the country's homeland security budget registered an increase of 12.8% over the previous year, with the Central Reserve Police Force (CRPF) receiving the largest share of the budget. Due to the nature of the security threats which the country faces, the main opportunities for growth in homeland security are expected in the aviation, mass transportation and maritime security markets. Following the increase in both domestic and foreign terrorist attacks, spending is expected to increase in surveillance technology, global positioning systems, radars and biometric systems.

Russia is the largest arms supplier to India

India is one the world's largest importers of military hardware, with an estimated import spending of over US$9 billion in 2009–2010. The country relies on imports to meet 70% of its defense requirements, with the remaining 30% met through domestic companies, of which the public sector fulfills 21% and the private sector fulfills 9% of the defense procurement requirements.

During the review period, Indian defense procurement policy has seen a strategic shift from Russia in favor of Israel and the US. There are other countries entering the market however, Russia is expected to dominate the arms market of India. The improving bilateral ties with US have led to the strengthening presence of American OEMs in the country. During forecast period, Israel and the US are expected to further strengthen their market

positions, reducing the market share of Russian and other European suppliers such as the UK, Germany and France.

Foreign OEMs are participating in joint ventures in order to enter the Indian defense industry

Despite the country's foreign direct investment (FDI) limit of 26%, the number of foreign companies entering the Indian defense industry through joint ventures has increased. An outlook of steady growth is driving foreign OEMs to change their strategy in order to adopt a long-term market view. The primary focus of these companies is to establish a presence in the market to enable them to take advantage of opportunities as they arise in future years. In addition to this, foreign OEMs are setting up export and outsourcing bases that can cater to global markets in the future.

Restricted FDI, lack of transparency and bureaucracy are the key challenges for the industry

Despite expanding opportunities in the Indian defense industry, the government's comparatively strict regulatory regime poses challenges for foreign investors who are keen to enter the country. With an FDI limit of just 26%, foreign OEMs are unwilling to extend sensitive technologies to their Indian joint venture partners. The critical area of concern is the offsets in defense, which have been placed at 30%, and in some cases, such as in the development of Medium Multi-Role Combat Aircraft (MMRCA), offsets rise to 50%.

Managing their offset obligations will continue to be the biggest challenge for foreign companies, especially due to the restricted FDI limit. However, the recent changes in offset policy indicate that the regulatory regime may ease during the forecast period, making the Indian defense market more competitive. With continued pressure on the government from Indian industry bodies and key corporate companies, the FDI limit as part of joint ventures is expected to increase to 49% during the forecast period.

Published: November 2011

3 Market Attractiveness and Emerging Opportunities

The Indian defense market offers numerous market opportunities to both domestic and foreign manufacturers. As one of the largest defense equipment markets in the world, the country is expected to spend US$120.3 billion on capital acquisition alone during the forecast period. In the next two years, the country is forecast to spend a significant amount of money on homeland security, intelligence and cyber security, primarily due to an increasingly hazardous geopolitical environment, the threat of terrorism and internal security concerns.

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3.1 Defense Market Size Historical and Forecast

3.1.1 India's total defense expenditure to grow at a CAGR of 13.08% over the forecast period

India's defense expenditure was US$33.0 billion in 2010, and grew at a CAGR of 12.57% during the review period. The country's defense expenditure grew at a rapid pace due to the external threats it faces from hostile neighbors. The country's strong economic growth has also supported the defense budget's growth. The total expenditure on defense during the review period was US$147.8 billion.

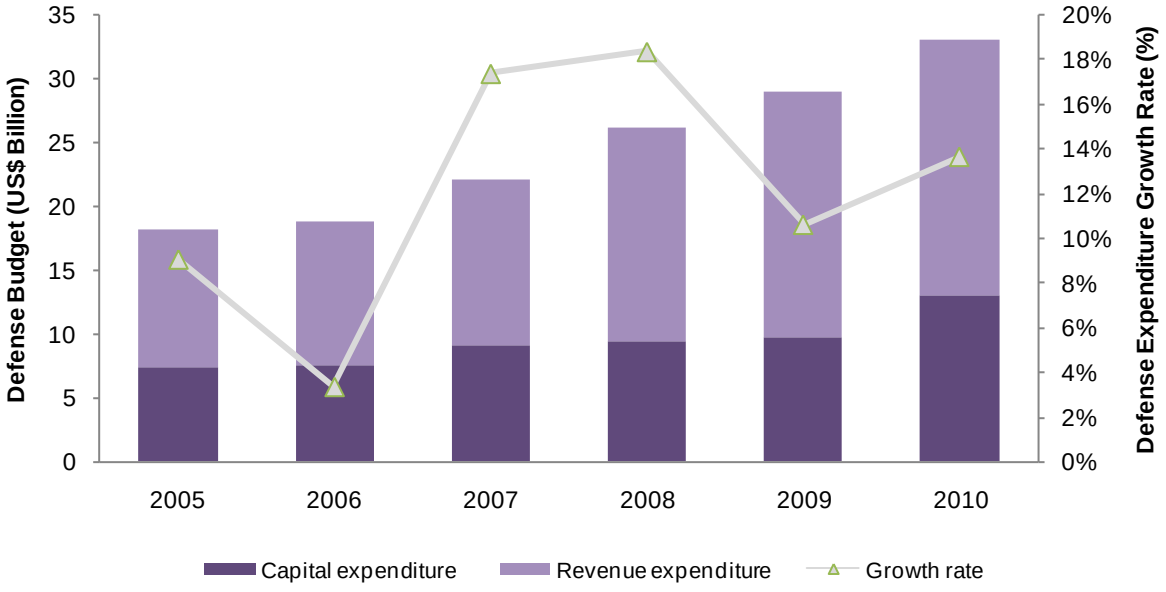
The following table and chart below shows the defense expenditure of India during the review period:

Table 1: Indian Defense Expenditure (US$ Billion), 2005–2010

Year	US$ Billion	% Growth
2005	18	9.1%
2006	19	3.3%
2007	22	17.4%
2008	26	18.4%
2009	29	10.6%
2010	33	13.7%
	CAGR 2005–2010	12.57%

Source: Indian Ministry of Defense and ICD Research analysis

Figure 1: Indian Defense Expenditure (US$ Billion), 2005–2010



Source: Indian Ministry of Defense and ICD Research analysis

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The Indian defense budget valued US$36.7 billion in 2011, and is expected to grow at a CAGR of 13.08% over the forecast period, to reach US$67.87 billion by 2016. The country's total defense expenditure during the forecast period is expected to be US$304.8 billion, out of which US$120.3 billion will be spent on the acquisition of military hardware while the remaining US$184.5 billion will be spent on the upkeep of its personnel, maintenance of existing equipments and construction of facilities.

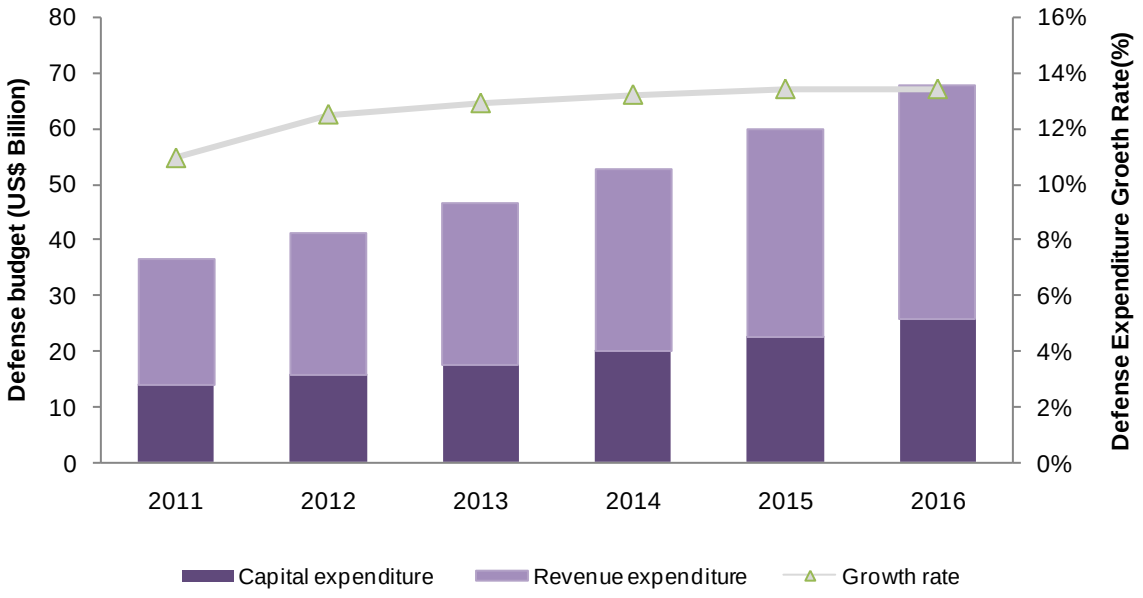
The following table and chart shows the India's defense expenditure during the forecast period:

Table 2: Indian Defense Expenditure (US$ Billion), 2011–2016

Year	US$ Billion	% Growth
2011	36.7	11.0%
2012	41.2	12.5%
2013	46.6	12.9%
2014	52.7	13.2%
2015	59.8	13.4%
2016	67.8	13.4%
	CAGR 2011–2016	13.08%

Source: Indian Ministry of Defense and ICD Research analysis

Figure 2: Indian Defense Expenditure (US$ Billion), 2011–2016



Source: Indian Ministry of Defense and ICD Research analysis

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3.1.2 Hostile neighbors and modernization initiative will be the industry's primary growth drivers

The Indian defense expenditure is primarily driven by the need to replace the country's ageing military hardware and to protect India from its hostile neighbors. The country's strong economic growth has also fueled India's defense industry growth.

Hostile neighbors: India has two hostile neighbors, Pakistan and China, with whom it has been engaged in small- to large-scale wars since 1947. Both China and Pakistan are spending heavily on enhancing their military power, which is putting pressure on the Indian government to increase its defense expenditure and focus on modernizing its armed forces.

Ageing military hardware and systems: The Indian defense industry needs to replace its aging military systems and equipment acquired during the Soviet era. This is set to fuel strong growth in the industry during the forecast period, as the government procures a large amount of military hardware

Strong economic growth: The country's strong economic growth has been linked to the modernization of the country's armed forces. India's gross domestic product (GDP) has grown steadily at a CAGR of 15.08% during 2005–2010. This growth is expected to continue, with the economy expected to grow at a CAGR of 10.43% during 2011–2016. This will provide flexibility in terms of budgetary allocations and, as such, defense spending in absolute terms is also expected to increase.

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3.1.3 Defense budget as a percentage of GDP will remain at an average of 2.1% over the forecast period

During the review period, India's average defense expenditure as a percentage of GDP was 2.1%. Despite the expected continuation of a low-level of military spending as a percentage of GDP, India's defense spending is set to increase. The per-capita defense budget, which stood at US$16 in 2005, increased at a CAGR of 11.00% during the review period, to reach US$28 by 2010.

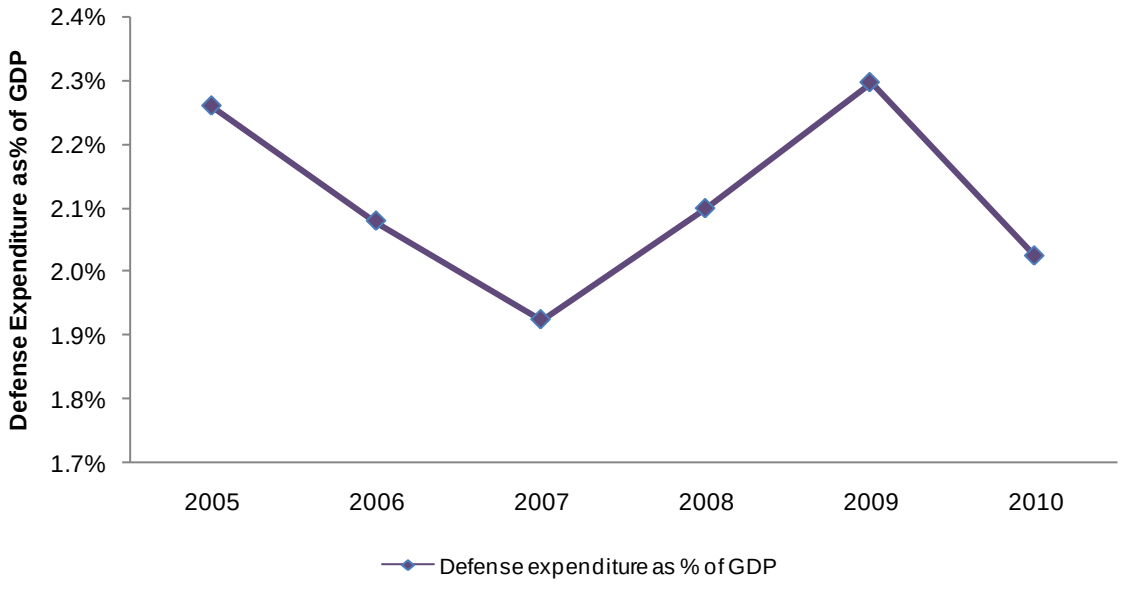
The following table and chart shows the defense expenditure of India as a percentage of GDP during the review period:

Table 3: Indian Defense Expenditure as a Percentage of GDP, 2005–2010

Year	% of GDP
2005	2.3%
2006	2.1%
2007	1.9%
2008	2.1%
2009	2.3%
2010	2.0%

Source: Indian Ministry of Defense and ICD Research analysis © **ICD Research**

Figure 3: Indian Defense Expenditure as a Percentage of GDP, 2005–2010



Source: Indian Ministry of Defense and ICD Research analysis © **ICD Research**

The Indian defense budget as a percentage of GDP is estimated to reach 2.0% in 2011, and is expected to increase to 2.2% of GDP by 2016. The increase in expenditure for defense will lead to the per-capita defense expenditure to rising to US$53 by 2016.

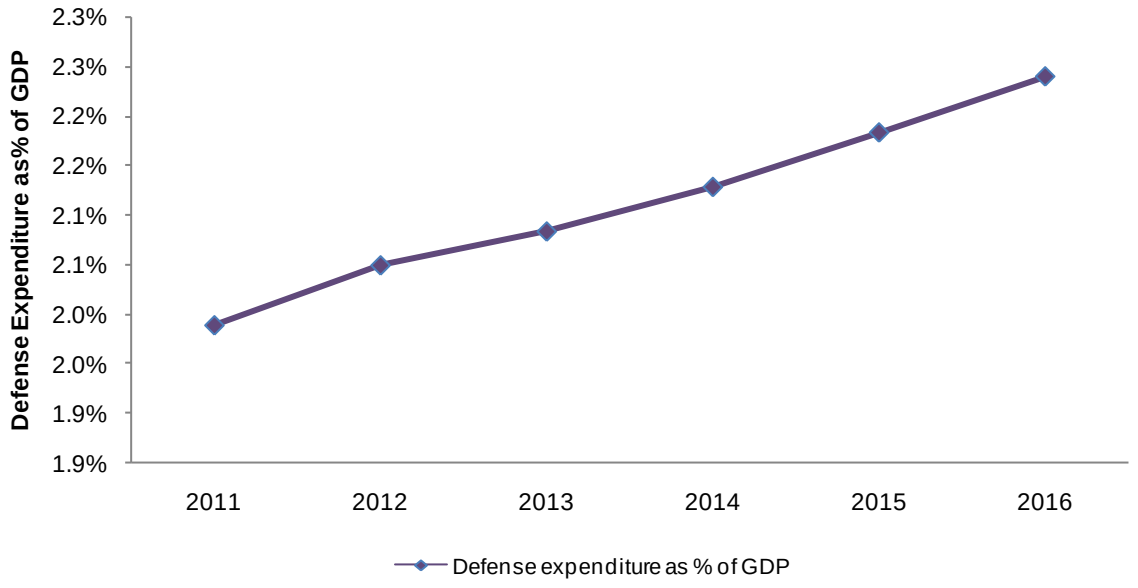
The following table and chart shows the defense expenditure of India as a percentage of GDP during the forecast period:

Table 4: Indian Defense Expenditure as a Percentage of GDP, 2011–2016

Year	% of GDP
2011	2.0%
2012	2.0%
2013	2.1%
2014	2.1%
2015	2.2%
2016	2.2%
	2.0%

Source: Indian Ministry of Defense and ICD Research analysis

Figure 4: Indian Defense Expenditure as a Percentage of GDP, 2011–2016



Source: Indian Ministry of Defense and ICD Research analysis

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3.2 Analysis of Defense Budget Allocation

3.2.1 Capital expenditure allocation expected to remain at an average of 39% during the forecast period

Throughout the review period, the average capital expenditure allocation of the total Indian defense budget was 38%. However, in 2010, this increased to 40% of total defense expenditure. Despite the minimal increase in the country's total defense budget, the capital expenditure allocation is expected to increase to an average of 39% during the forecast period, as India is modernizing its armed forces. On a cumulative basis, the country is expected to allocate US$120.3 billion for the acquisition of defense equipment during the forecast period, while US$184.5 billion will be reserved for revenue expenditure.

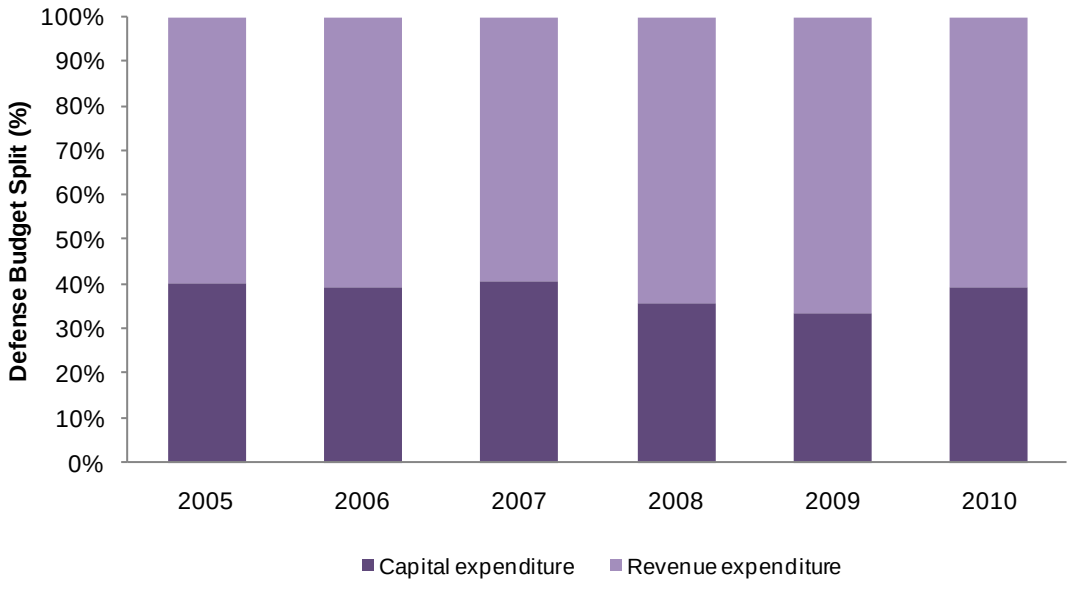
The following table and chart below shows the share of capital and revenue expenditure of India during the review period:

Table 5: Indian Defense Budget Split between Capital and Revenue Expenditure (%), 2005–2010

Year	Capital expenditure share (%)	Revenue expenditure share (%)
2005	40%	60%
2006	40%	60%
2007	41%	59%
2008	36%	64%
2009	34%	66%
2010	40%	60%

Source: Indian Ministry of Defense and ICD Research analysis

Figure 5: Indian Defense Budget Split between Capital and Revenue Expenditure (%), 2005–2010



Source: Indian Ministry of Defense and ICD Research analysis

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During the forecast period, revenue expenditure is expected to gain the majority of the defense budget allocation. However, the average allocation for capital expenditure which stood at 38% during the review period is expected to increase to 39% during the forecast period, due to the government's major defense modernization plans which require capital expenditure.

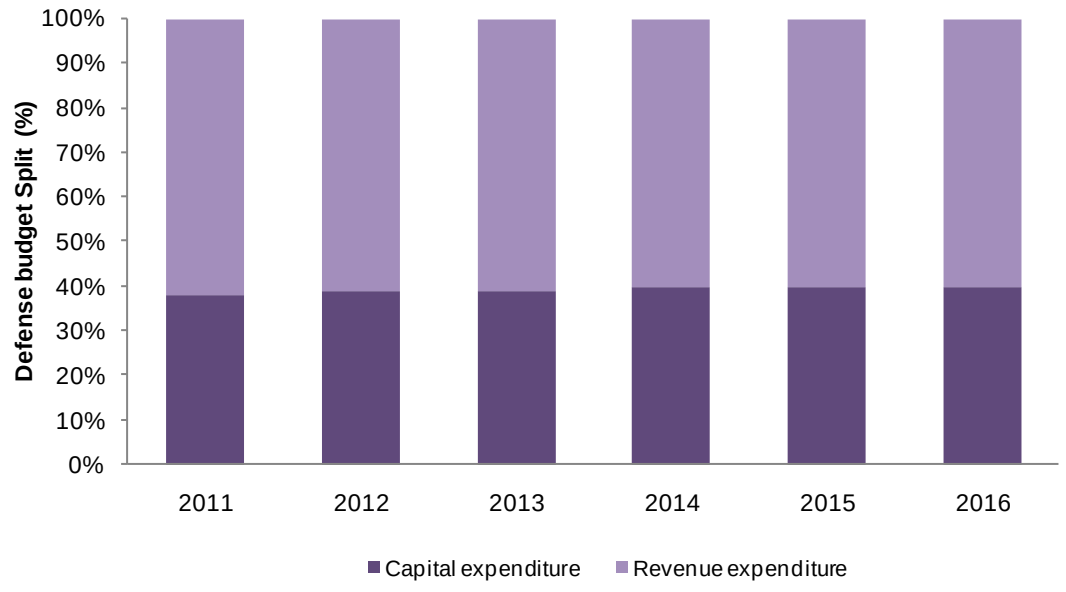
The following table and chart below shows the share of capital and revenue expenditure of India during the forecast period:

Table 6: Indian Defense Budget Split between Capital and Revenue Expenditure (%), 2011–2016

Year	Capital expenditure share (%)	Revenue expenditure share (%)
2011	38%	62%
2012	39%	61%
2013	39%	61%
2014	40%	60%
2015	40%	60%
2016	40%	60%

Source: Indian Ministry of Defense and ICD Research analysis

Figure 6: Indian Defense Budget Split between Capital and Revenue Expenditure (%), 2011–2016



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Source: Indian Ministry of Defense and ICD Research analysis

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3.2.2 Army gets the largest share of the defense budget

In the Indian defense budget the army receives the largest share of the total defense budget expenditure. The main reason for the army's large budget allocation is the large size of the army. During the review period, the army was allocated an average of 50% of the total defense budget, while the air force which was allocated 26%, the navy was allocated 17%, and the of the department of defense production and research and development received 7% of the total defense budget.

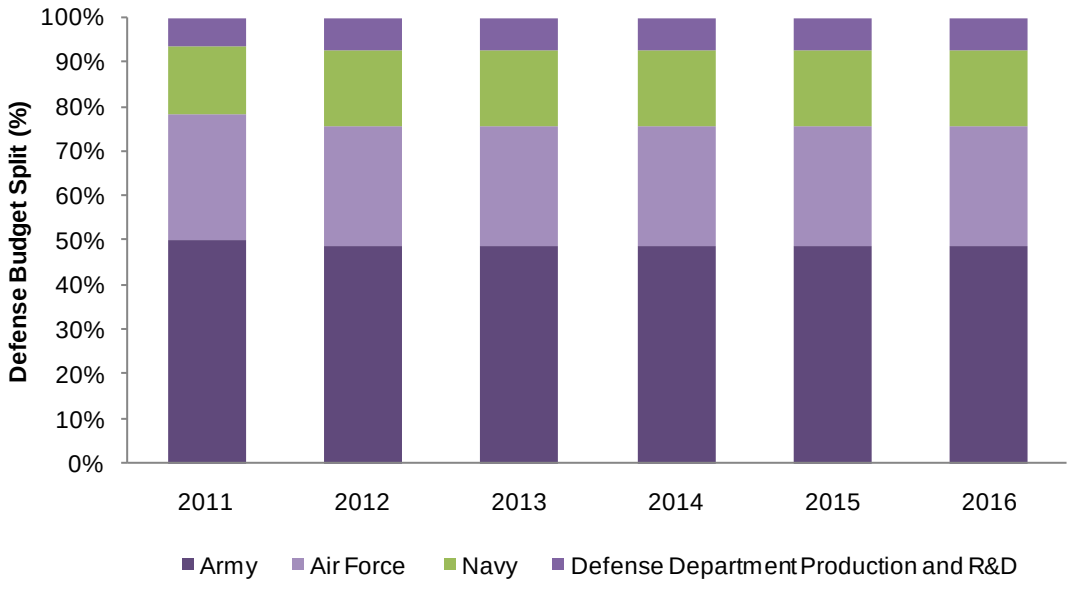
The following table and chart below shows the share of capital and revenue expenditure of India during the review period:

Table 7: Indian Defense Budget Split (%), 2005–2010

Year	Army	Air Force	Navy	Department of defense production and R&D
2005	49%	27%	17%	7%
2006	46%	28%	19%	6%
2007	50%	26%	17%	7%
2008	50%	26%	15%	9%
2009	53%	23%	16%	8%
2010	50%	26%	17%	8%

Source: Indian Ministry of Defense and ICD Research analysis

Figure 7: Indian Defense Budget Split (%), 2005–2010



Source: Indian Ministry of Defense and ICD Research analysis

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During the forecast period, the army is expected to continue receiving the largest share of the total defense budget. The army's defense budget allocation is expected to decline marginally from an average of 50% during the review period to an average of 49% during the forecast period. The allocation for air force is expected to remain at an average of 27%, while the navy will receive an allocation of 17%, and department of defense production and research and development will receive an allocation of 7% of the total defense budget over the forecast period.

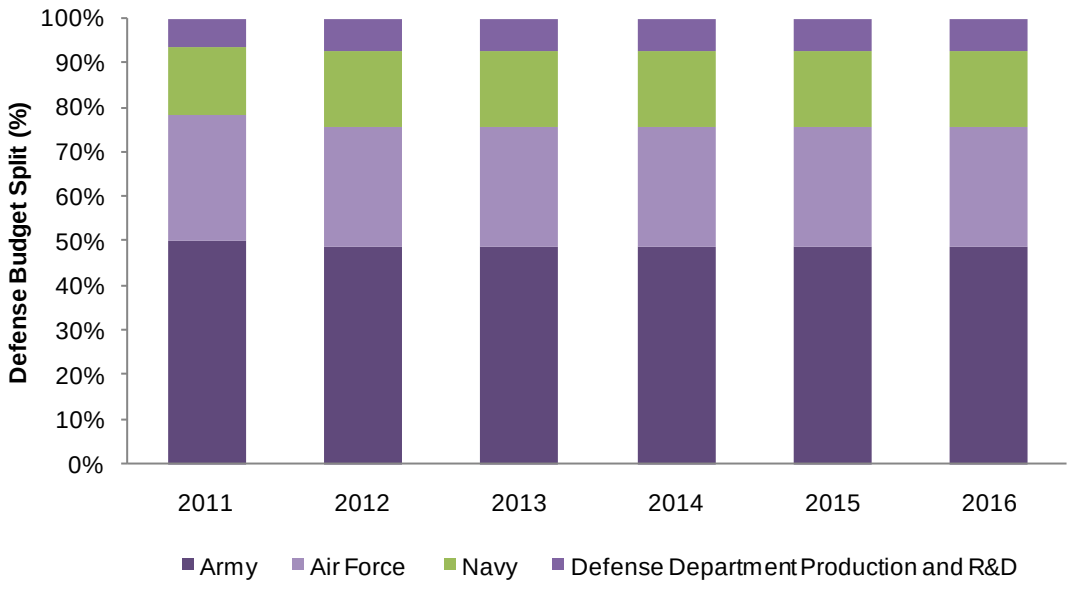
The following table and chart below shows the share of capital and revenue expenditure of India during the forecast period:

Table 8: Indian Defense Budget Split (%), 2011–2016

Year	Army	Air Force	Navy	Department of defense production and R&D
2011	50%	28%	15%	6%
2012	49%	27%	17%	7%
2013	49%	27%	17%	7%
2014	49%	27%	17%	7%
2015	49%	27%	17%	7%
2016	49%	27%	17%	7%

Source: Indian Ministry of Defense and ICD Research analysis

Figure 8: Indian Defense Budget Split (%), 2011–2016



Source: Indian Ministry of Defense and ICD Research analysis

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3.2.3 Defense ministry will spend US$149.8 billion on its army over the forecast period

The Indian army has the second-largest personnel size in the world, second only to the Chinese army. This huge size of the armed forces demands high maintenance expenditure. The Indian Ministry of Defense allocated 50% of its defense budget for army during the review period. The army's budget stood at US$8.9 billion in 2005 and reached US$16.5 billion by 2010, registered a CAGR of 12.96% during the review period. During the review period, the Indian Ministry of Defense spent US$73.9 billion on its army.

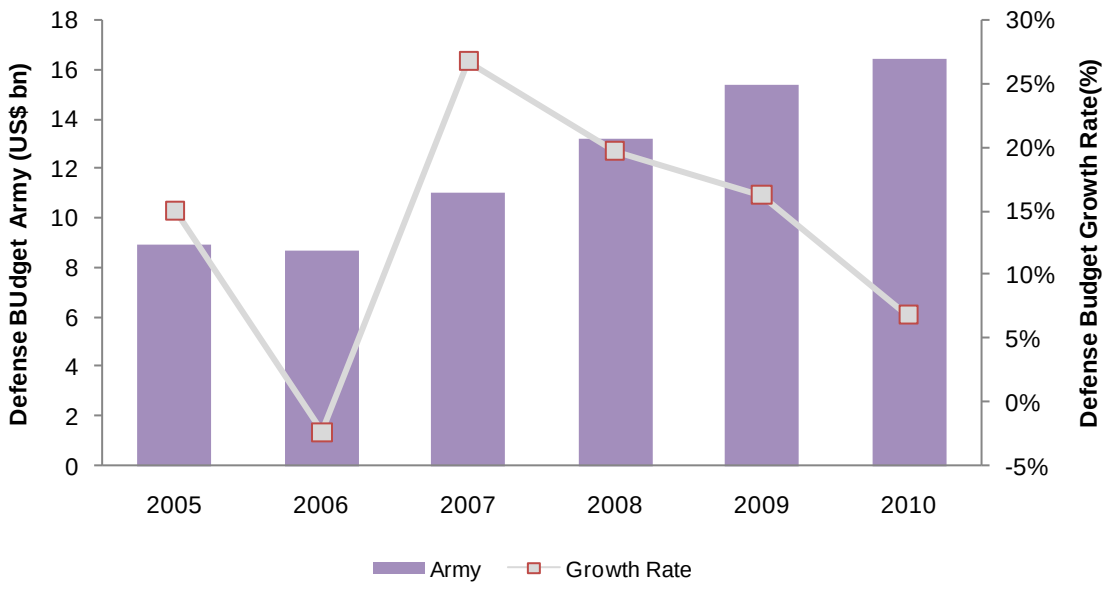
The following table and chart below shows the army expenditure of India during the review period:

Table 9: Indian Defense Expenditure for Army (US$ Billion), 2005–2010

Year	US$ Billion	% Growth
2005	9	15%
2006	9	-2%
2007	11	27%
2008	13	20%
2009	15	16%
2010	16	7%
	CAGR 2005–2010	12.96%

Source: Indian Ministry of Defense and ICD Research analysis **© ICD Research**

Figure 9: Indian Defense Expenditure for Army (US$ Billion), 2005–2010



Source: Indian Ministry of Defense and ICD Research analysis **© ICD Research**

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During the forecast period, the army is expected to receive the largest allocation of the Indian defense budget. The average allocation for army is expected to be 49% of the total defense budget in India. The expenditure for army, which is estimated at US$18.5 billion in 2011, is expected to grow at a CAGR of 12.46% over the forecast period, to reach US$33.2 billion by 2016. The total expenditure for army during the forecast period is estimated at US$149.8 billion.

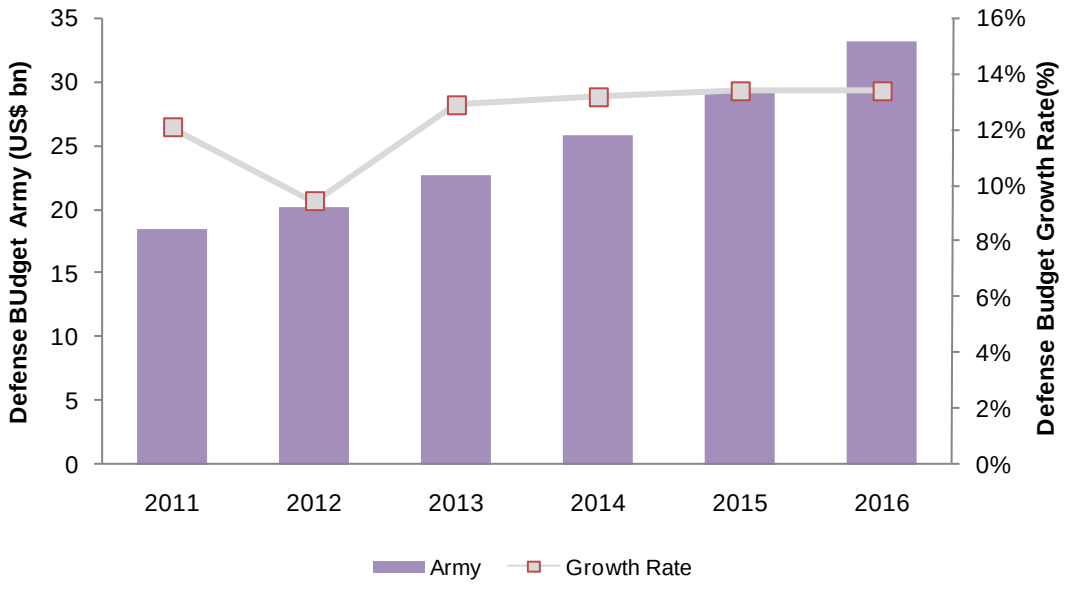
The following table and chart shows the expenditure for army during the forecast period:

Table 10: Indian Expenditure for Army (US$ Billion), 2011–2016

Year	US$ Billion	% Growth
2011	18	12%
2012	20	9%
2013	23	13%
2014	26	13%
2015	29	13%
2016	33	13%
	CAGR 2011–2016	12.46%

Source: Indian Ministry of Defense and ICD Research analysis

Figure 10: Indian Expenditure for Army (US$ Billion), 2011–2016



Source: Indian Ministry of Defense and ICD Research analysis

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3.2.4 Defense ministry will spend US$82.7 billion on its air force over the forecast period

The Indian government is modernizing its air force to counter the threats of Pakistan and China. The Indian Ministry of Defense allocated an average of 26% of its defense budget on the air force during the review period. The air force budget stood at US$4.9 billion in 2005, and registered a CAGR of 11.68% during the review period, to reach US$8.6 billion by 2010. During the review period, the Indian Ministry of Defense spent US$38.0 billion on its air force.

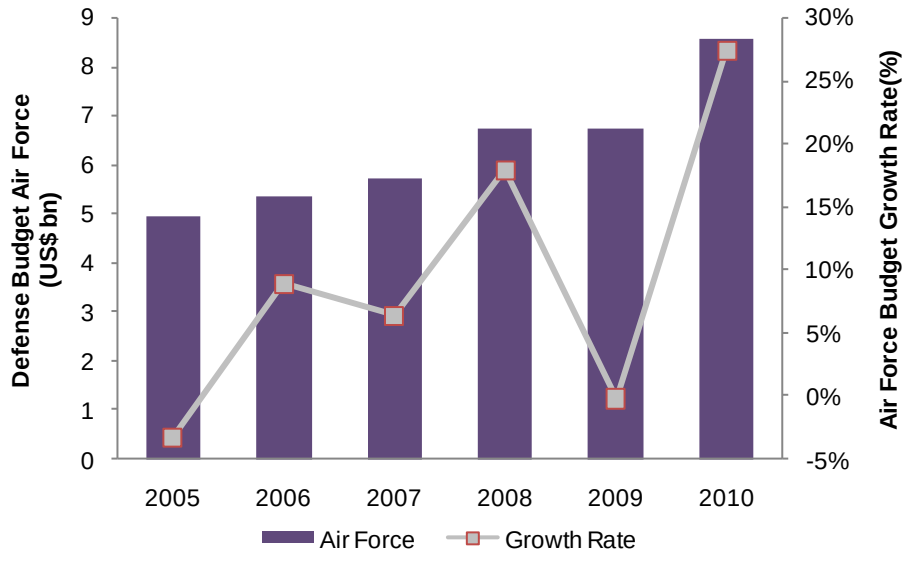
The following table and chart below shows the air force expenditure of India during the review period:

Table 11: Indian Defense Expenditure for Air Force (US$ Billion), 2005–2010

Year	US$ Billion	% Growth
2005	4.9	-3%
2006	5.4	9%
2007	5.7	6%
2008	6.7	18%
2009	6.7	0%
2010	8.6	27%
	CAGR 2005–2010	12.18%

Source: Indian Ministry of Defense and ICD Research analysis **© ICD Research**

Figure 11: Indian Defense Expenditure for Air Force (US$ Billion), 2005–2010



Source: Indian Ministry of Defense and ICD Research analysis **© ICD Research**

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During the forecast period, the Indian air force is expected to receive an average allocation of 27% the Indian defense budget. The expenditure for air force is estimated at US$10.3 billion in 2011, and is projected to grow at a CAGR of 12.18% over the forecast period, to reach US$18.3 billion by 2016. The total expenditure for air force during the forecast period is estimated at US$82.7 billion.

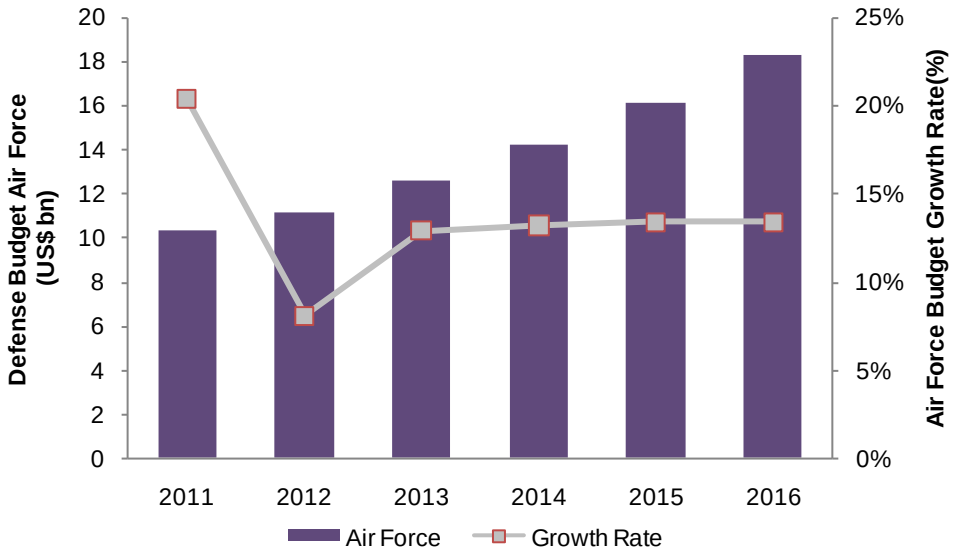
The following table and chart shows the expenditure for air force during the forecast period:

Table 12: Indian Expenditure for Air Force (US$ Billion), 2011–2016

Year	US$ Billion	% Growth
2011	10.3	20%
2012	11.1	8%
2013	12.6	13%
2014	14.2	13%
2015	16.1	13%
2016	18.3	13%
	CAGR 2011–2016	12.18%

Source: Indian Ministry of Defense and ICD Research analysis

Figure 12: Indian Expenditure for Air Force (US$ Billion), 2011–2016



Source: Indian Ministry of Defense and ICD Research analysis

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3.2.5 Expenditure for navy is expected to grow at a CAGR of 15.40% over the forecast period

The growing naval power in the Asia-Pacific has resulted in an arms race in the region. The government is modernizing its navy to counter the threats of Chinese submarines. To fulfill India's naval requirements, the Indian Ministry of Defense allocated an average of 17% of its defense budget for navy during the review period. The budget of navy valued US$3.2 billion in 2005, and registered a CAGR of 11.58% during the review period, to reach US$5.5 billion by 2010. During the review period, the Ministry of Defense spent US$24.7 billion on its navy.

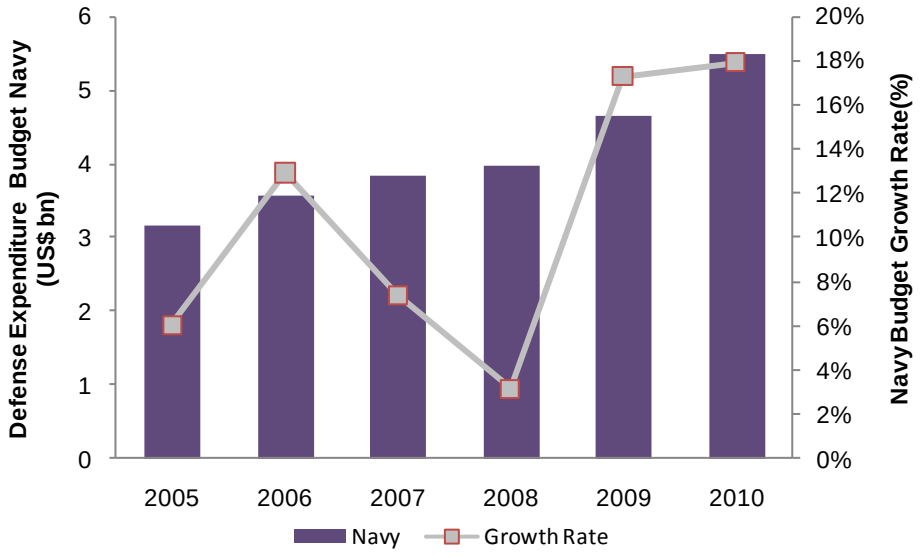
The following table and chart below shows the navy expenditure of India during the review period:

Table 13: Indian Defense Expenditure for Navy (US$ Billion), 2005–2010

Year	US$ Billion	% Growth
2005	3.2	6%
2006	3.6	13%
2007	3.8	7%
2008	4.0	3%
2009	4.7	17%
2010	5.5	18%
	CAGR 2005–2010	11.58%

Source: Indian Ministry of Defense and ICD Research analysis **© ICD Research**

Figure 13: Indian Defense Expenditure for Navy (US$ Billion), 2005–2010



Source: Indian Ministry of Defense and ICD Research analysis **© ICD Research**

During the forecast period, the navy is expected to continue receiving an average allocation of 17% the Indian defense budget. The expenditure for navy is expecting to reach at US$5.6 billion in 2011. Naval expenditure is expected to grow at a CAGR of 15.40% over the forecast period, to reach US$11.5 billion by 2016. The total expenditure for navy is estimated at US$51.2 billion during the forecast period.

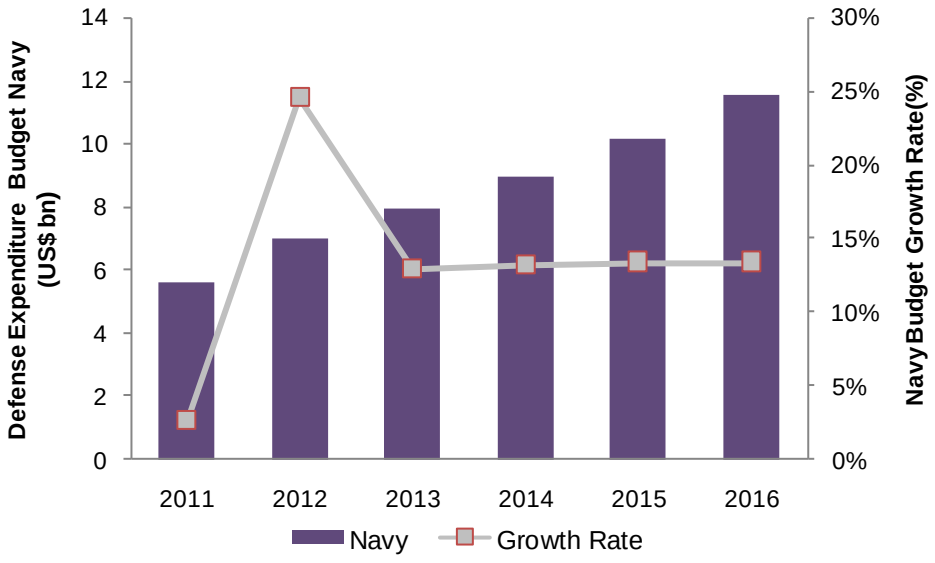
The following table and chart shows the expenditure for navy during the forecast period:

Table 14: Indian Expenditure for Navy (US$ Billion), 2011–2016

Year	US$ Billion	% Growth
2011	5.6	3%
2012	7.0	25%
2013	7.9	13%
2014	9.0	13%
2015	10.2	13%
2016	11.5	13%
	CAGR 2011–2016	15.40

Source: Indian Ministry of Defense and ICD Research analysis

Figure 14: Indian Expenditure for Navy (US$ Billion), 2011–2016



Source: Indian Ministry of Defense and ICD Research analysis

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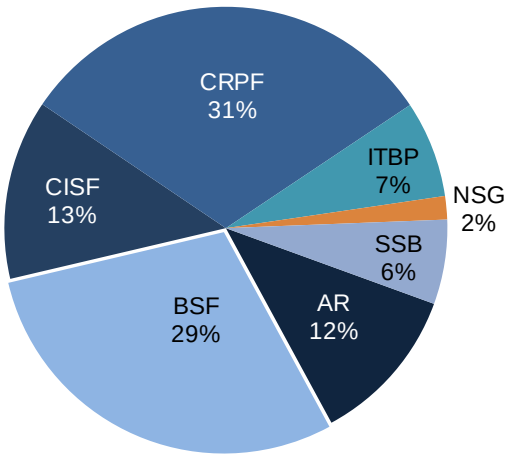
3.3 Homeland Security Market Size and Forecast

3.3.1 Homeland security budget of India estimated at US$5.7 billion for the year 2010

India's budget for their homeland security agencies, which consist of the state forces, paramilitary forces, central police and intelligence, was US$5.7 billion in 2010. This market is growing at a rapid pace, which is mostly due the attacks India receives from cross-border terrorists, the smuggling of arms and explosives, and domestic insurgency.

A majority of the homeland security budget in 2010 was allocated to the Central Reserve Police Force (CRPF) and the Boarder Security Force (BSF), to ensure the security of the Indian nation from terrorist attacks in areas such as Mumbai. The parliamentary police force, CRPF was allocated 31% of the Indian homeland security budget in 2010, while the BSF was allocated 29% of the budget of India. In addition, the Central Industrial Security Force (CISF) is expected to receive 13% of the homeland security budget.

Figure 15: Break-up of Indian Homeland Security Expenditure (%), 2010



Source: Indian Ministry of Defense and ICD Research analysis

This surge in government spending will create numerous opportunities in the following divisions:

- IP (internet protocol) surveillance solutions such as closed circuit television (CCTV)
- Global positioning systems
- Global system for mobile communication (GSM)-based tracking systems
- Interception/monitoring systems
- Radars
- Early warning systems
- Access control and identification systems

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- Biometric based systems
- Metal detectors and law enforcement products
- Night vision devices
- Thermal imaging systems
- Infrared equipment
- Radio frequency identification devices (RFID)

Government spending on homeland security has increased annually since the terrorist attacks on Mumbai in November 2008. This market is forecast to value between US$8–10 billion by 2015, which is mainly to protect India against internal and external threats. Following the 9/11 terrorist attacks in the US, the scope of homeland security has broadened to encompass a wide range of security issues, including aviation security, infrastructure security and cyber security.

The majority of growth opportunities will be seen across the following divisions:

Airports: the key technologies that will be incorporated to improve the standards of airport security include biometric electronic access control, passenger screening portals, explosive detection systems for baggage and cutting-edge passenger processing systems.

Mass transportation: mass transportation systems, which include railways and metro transportation, are highly susceptible to both criminal and terrorist attacks, and the threat of such incidents will lead to increases in spending in this market. Some of the technologies that will be demanded for mass transportation security are: intelligent and durable surveillance systems, self-diagnosing CCTV systems, automatic wireless image downloads and innovative passenger screening technologies.

Maritime security: government spending on maritime security is also expected to increase. A significant amount will be spent on the installation of 20 coast guard stations, along with all the relevant systems, technologies and equipment.

Apart from the above categories, there are other growth prospects in border security and the protection of critical infrastructure, including oil and gas pipelines, nuclear power stations, hydroelectric stations and roadways.

Although the rising threat of terrorist attacks and cross border infiltration has heightened the interest of domestic private companies in India's homeland security market, the capabilities of these indigenous companies are still underdeveloped. As a result, domestic firms are forming joint ventures with foreign companies to improve their product offerings and to make up for the inadequacy of the country's public sector units.

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3.3.2 Cross-border terrorism and domestic insurgency to be the main drivers of the homeland security

The increased threat of terrorism is forcing the country to modernize its defense forces at a rapid pace. This has led to a sharp increase in the country's defense budget and a shorter sales cycle. As such, there are lucrative opportunities for defense equipment manufacturers in India, as the government is arming its security forces with new sophisticated firearms, night-vision equipments, communication devices, and unmanned aerial vehicles (UAVs).

India falls under the "worst affected" category regarding terrorism and is ranked fourth on the ICD Research Terrorism Index. The threat of terrorism has increased significantly in India during the review period, in light of continued terrorist attacks across India. Some notable terrorist activities affecting India include the 26/11 attacks on Mumbai, the war in Afghanistan, and the regrouping and strengthening of the Taliban. In addition to religion-based insurgencies, long-running domestic insurgencies, headed by separatist groups such as the Maoists and the Naxalities, continue to pose new challenges for Indian security forces.

Moreover, the nature and target of terror attacks have radically changed during the review period, forcing the government to realign its counter strategy, force and equipment. While Islamic terrorist groups are increasingly targeting the Indian urban population in metro cities and economic hubs, the Maoists have expanded their influence into rural and impoverished regions. India also runs the risk of being targeted by terrorist groups in Afghanistan and Pakistan, which are countries with ongoing wars.

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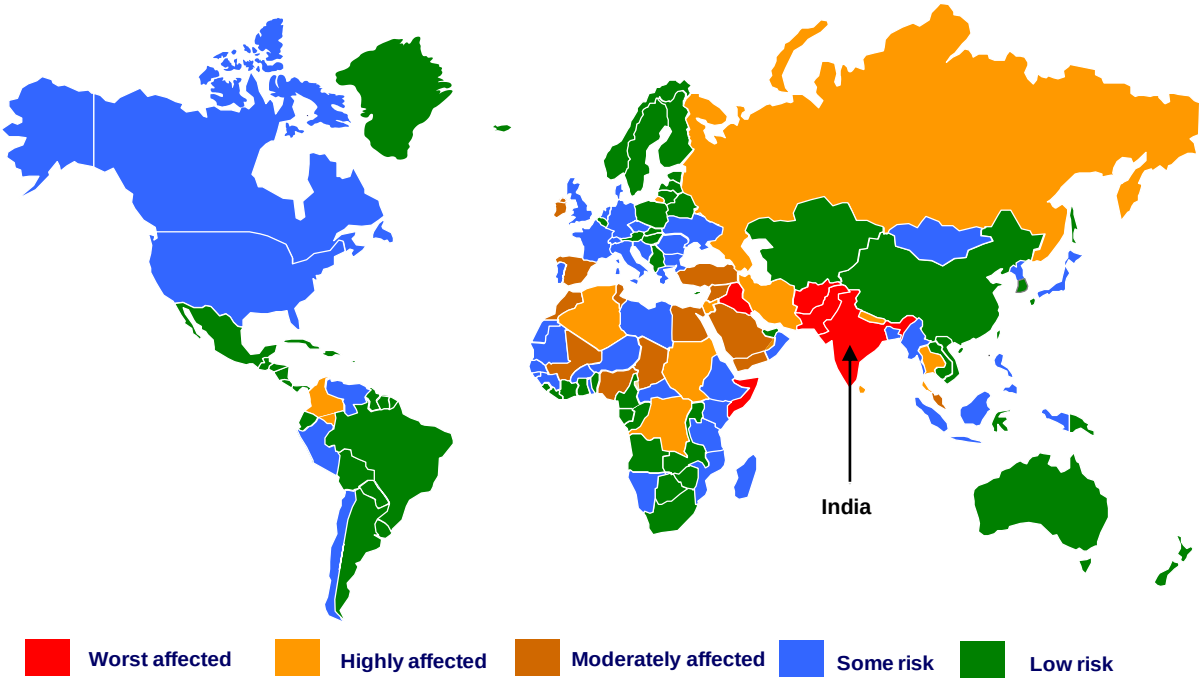
3.3.3 India falls under "worst affected" of terrorism category

According to the ICD Research Intelligence Terrorism Index, India falls under the "worst affected" category, with a global rank of fourth. The neighboring countries of Pakistan and Bangladesh also fall under the "worst affected" category, indicating the area is an environment with high terrorist activity.

The following is the ICD research terrorism heat map which displays the threat level faced by countries across the world:

Figure 16: ICD Research Terrorism Heat Map



Source: ICD Research analysis

3.3.4 India has terrorism index score of 5.1

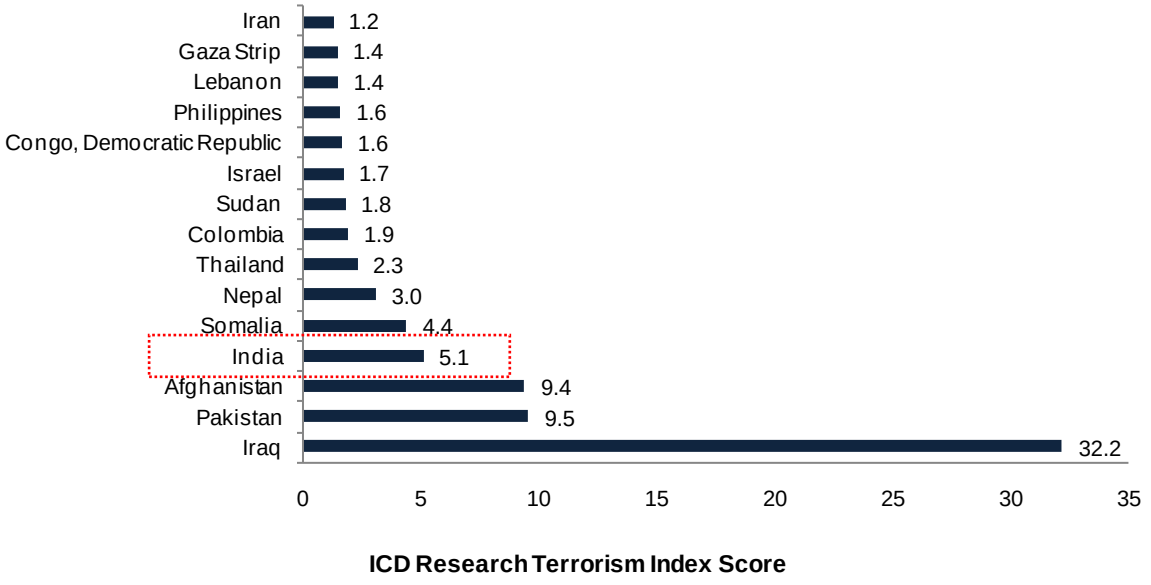
The terrorism index is calculated on the basis of the following factors:

- The number of terror attacks that the country has faced
- The total number of people victimized
- The number of foreign terrorist organizations operating in the country

While the top fifteen countries display an average of 5.64 on the terrorism index score, India's score is estimated to be 5.1, making it below the top 15 country terrorism average. However, given the skewed nature of the terrorism index, India is the fourth-most-susceptible country to terrorism.

The following is the ICD research terrorism heat map which displays the threat level faced by countries across the globe:

Figure 17: ICD Research Terrorism Index



Source: ICD Research analysis

3.4 Benchmarking with Key Global Markets

3.4.1 India's defense budget expected to grow at a CAGR of 13.08% which is largest among the key global defense spenders

Indian defense expenditure valued US$33.0 billion in 2010, which is a modest figure in comparison to countries with the highest global defense expenditure, such as the US and China. However, India's defense budget growth during the forecast period is expected to be faster than majority of the key global defense spenders. The country's defense budget is expected to grow at a CAGR of 13.08% over the forecast period.

The following chart benchmarks the growth of Indian budget with key markets:

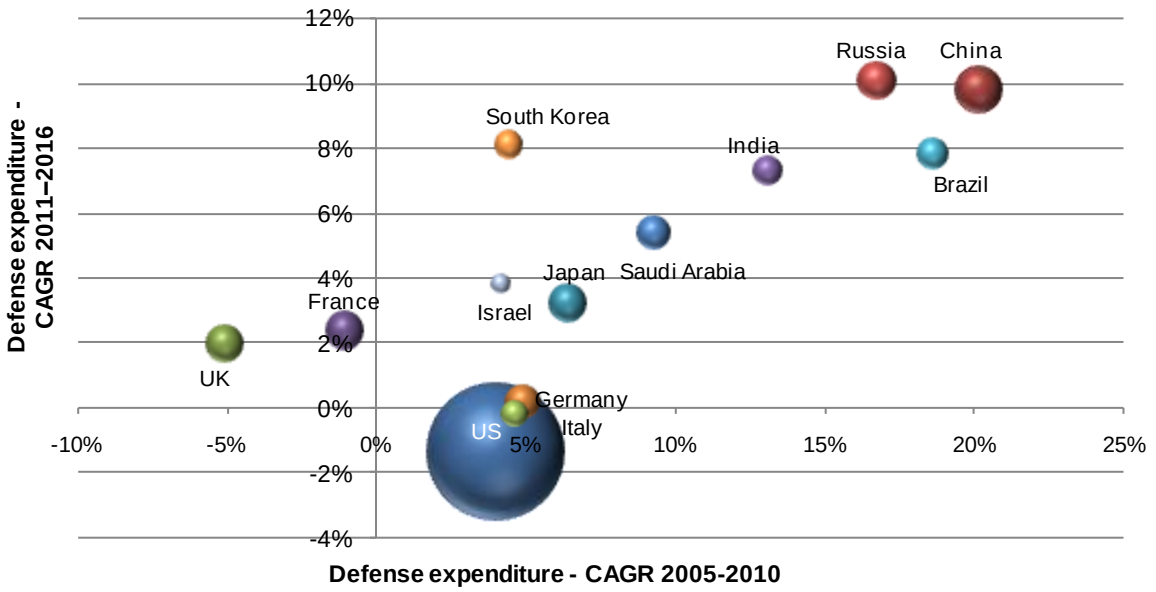
Table 15: Benchmarking with Key Markets, Review Period vs Forecast Period

Country	CAGR (2005–2010)	CAGR (2011–2016)	Budget in 2010 (US$ billions)
US	4%	-1%	722
China	20%	10%	78
UK	-5%	2%	51
France	-1%	2%	56
Japan	6%	3%	53
Germany	5%	0%	42
Saudi Arabia	9%	5%	42
Russia	17%	10%	50
Italy	5%	0%	27
India	13%	13%	33
Brazil	19%	8%	33
Australia	11%	1%	23
Israel	4%	4%	13

Source: ICD Research analysis

Published: November 2011

Figure 18: Benchmarking with Key Markets, Review Period vs Forecast Period



Source: ICD Research analysis

3.4.2 The US and China dominate the global defense industry

While the US and China dominate the global defense industry with defense budgets of US$722 billion and US$78 billion respectively in 2010, India maintains significant presence in the international arms market. The Indian defense budget is expected to grow at a CAGR of 13.08% during the forecast period and, as a result, it will surpass the defense expenditure of Germany and Saudi Arabia. The Indian defense budget is expected to value US$68 billion by 2016.

The following table and chart shows the defense expenditures of the largest military spenders in the world in 2010 and 2016:

Table 16: Benchmarking with Large Defense Spenders in the World (US$ Billion), 2010 and 2016

Country	Budget in 2010 (US$ billions)	Budget in 2016 (US$ billions)
US	722	688
China	78	137
UK	51	57
France	56	62
Japan	53	64
Germany	42	43
Saudi Arabia	42	58
Russia	50	89
India	33	68
Italy	27	26

Source: ICD Research analysis

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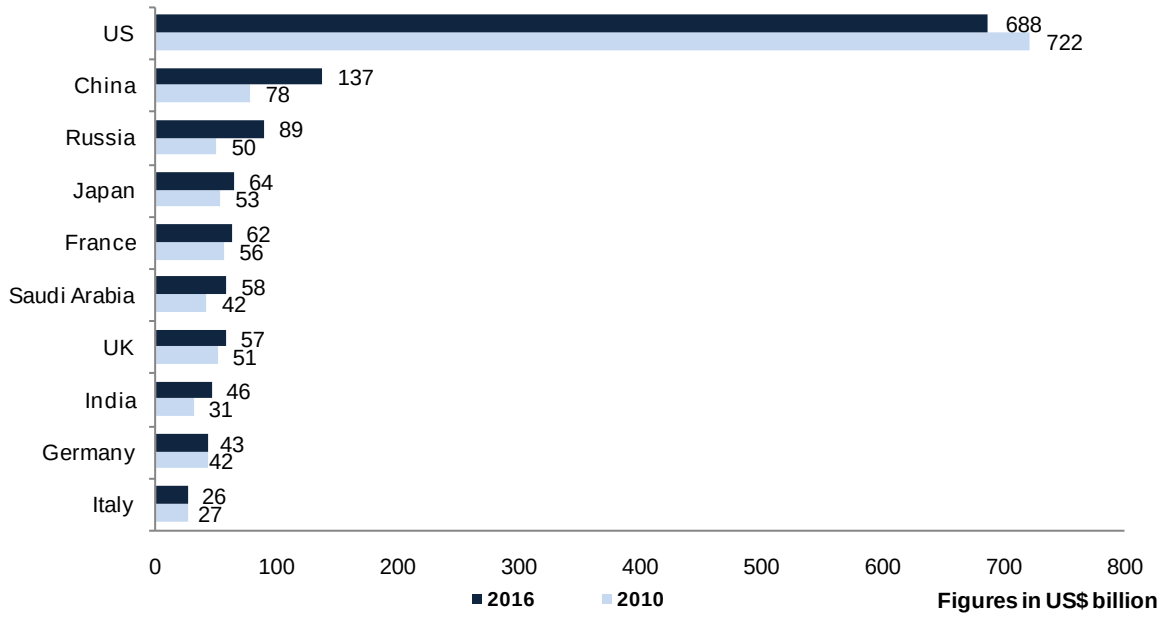
Figure 19: Benchmarking with Large Defense Spenders in the World (US$ Billion), 2010 and 2016



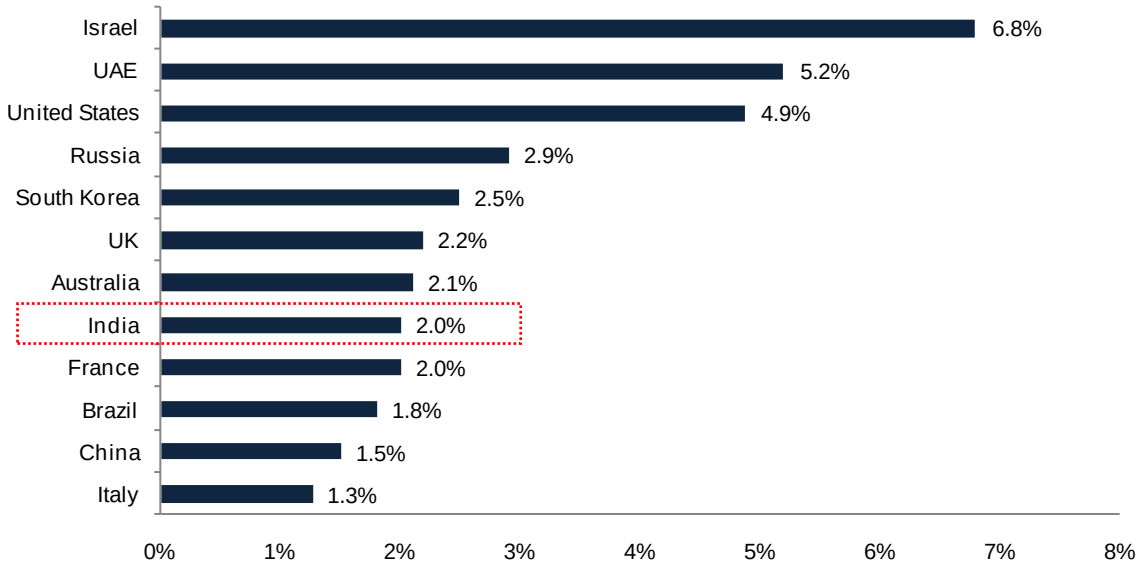
Source: ICD Research analysis

3.4.3 India allocates a lower share of its GDP for defense than countries with significant global defense expenditure

As a percentage of GDP, India defense expenditure stood at 2.0% during 2010. While this is a larger percentage than China, the country's defense expenditure as a percentage of GDP is lower than the majority of large spenders such as US and Russia. During the forecast period, Indian defense expenditure as a percentage of GDP is expected to increase to 2.2%.

The figure benchmarks Indian defense expenditure as a percentage of GDP with the leading defense spending nations:

Figure 20: Defense Expenditure as a Percentage of GDP of Largest Military Spenders (%), 2010



Source: ICD Research analysis

3.4.4 India faces significant threat from foreign terrorist organizations

According to the ICD Research Intelligence Terrorism Index, Iraq, Pakistan, Afghanistan, Somalia and India are the countries that are worst affected by terrorism. Based on the index score, India has a ranking of fourth, which indicates significant threat from foreign terrorist organizations when compared to other countries worldwide.

The terrorism index is calculated on the basis of the following factors:

- The number of terror attacks that the country has faced
- Total number of people victimized
- The number of foreign terrorist organizations operating in the country

The table below shows the ICD Research Terrorism Index score of the top-50-most-affected countries by terrorism in the world:

Table 17: ICD Research Terrorism Index

Rank	Country	Terrorism Score
1	Iraq	32.2
2	Pakistan	9.5
3	Afghanistan	9.4
4	India	5.1
5	Somalia	4.4
6	Nepal	3.0
7	Thailand	2.3
8	Colombia	1.9
9	Sudan	1.8
10	Israel	1.7
11	Congo, Democratic Republic	1.6
12	Philippines	1.6
13	Lebanon	1.4
14	Gaza Strip	1.4
15	Iran	1.2
16	Sri Lanka	1.2
17	Russia	1.2
18	Algeria	1.0
19	Yemen	1.0
20	Turkey	0.9
21	West Bank	0.6
22	Chad	0.6
23	Syria	0.6
24	Egypt	0.5
25	Nigeria	0.5
26	United Kingdom	0.5

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Table 17: ICD Research Terrorism Index

27	Greece	0.5
28	Malaysia	0.5
29	Indonesia	0.4
30	Spain	0.4
31	Jordan	0.3
32	Uzbekistan	0.3
33	Bangladesh	0.3
34	France	0.3
35	Ethiopia	0.3
36	Burma	0.3
37	Mali	0.3
38	Libya	0.2
39	Tajikistan	0.2
40	Saudi Arabia	0.2
41	Kenya	0.2
42	Morocco	0.2
43	Ireland	0.2
44	Singapore	0.2
45	Central African Republic	0.2
46	Niger	0.2
47	Georgia	0.2
48	Peru	0.2
49	Senegal	0.2
50	Venezuela	0.1

Source: ICD Research analysis **© ICD Research**

3.5 Market Opportunities: Key Trends and Drivers

3.5.1 FDI set to increase, driven by government's policy shift from 'buy' to 'make' strategy

India is emerging as one of the most lucrative and attractive defense markets for major international defense companies to invest in. FDI in the country's defense is rising significantly, although it is still very low when compared to other industries in the Indian economy and when compared to global defense industries. FDIs in the industry remained at US$50,000 during 2006–2008, before recording a significant increase in 2009, to reaching US$150,000. The Ministry of Defense has introduced major changes to defense procurement policy, which are expected to create market-entry opportunities for private companies, and to encourage joint ventures between domestic and foreign companies. The changes, which came into effect in November 2009, allow Indian companies to manufacture defense goods under the 'buy and make' strategy. The policy, which requires the end product to have at least 50% indigenous content, will encourage the transfer of technology and co-production arrangements with foreign OEMs. As a result, the FDI inflow and the number of joint ventures are expected to increase significantly in the Indian defense industry.

However, the FDI limit in the Indian defense industry remains limited to 26%. At this level of commitment, foreign companies are unwilling to extend sensitive or critical technologies to the local joint venture partner. This challenge will restrict India to low-end defense production. Recently, industry associations, such as Associated Chambers of Commerce (ASSOCHAM), and leading private companies have encouraged the government to increase the FDI limit to 49%. As a result, the FDI limit is expected to increase during the forecast period, which will generate investment inflows and lead to greater levels of technology access to Indian companies.

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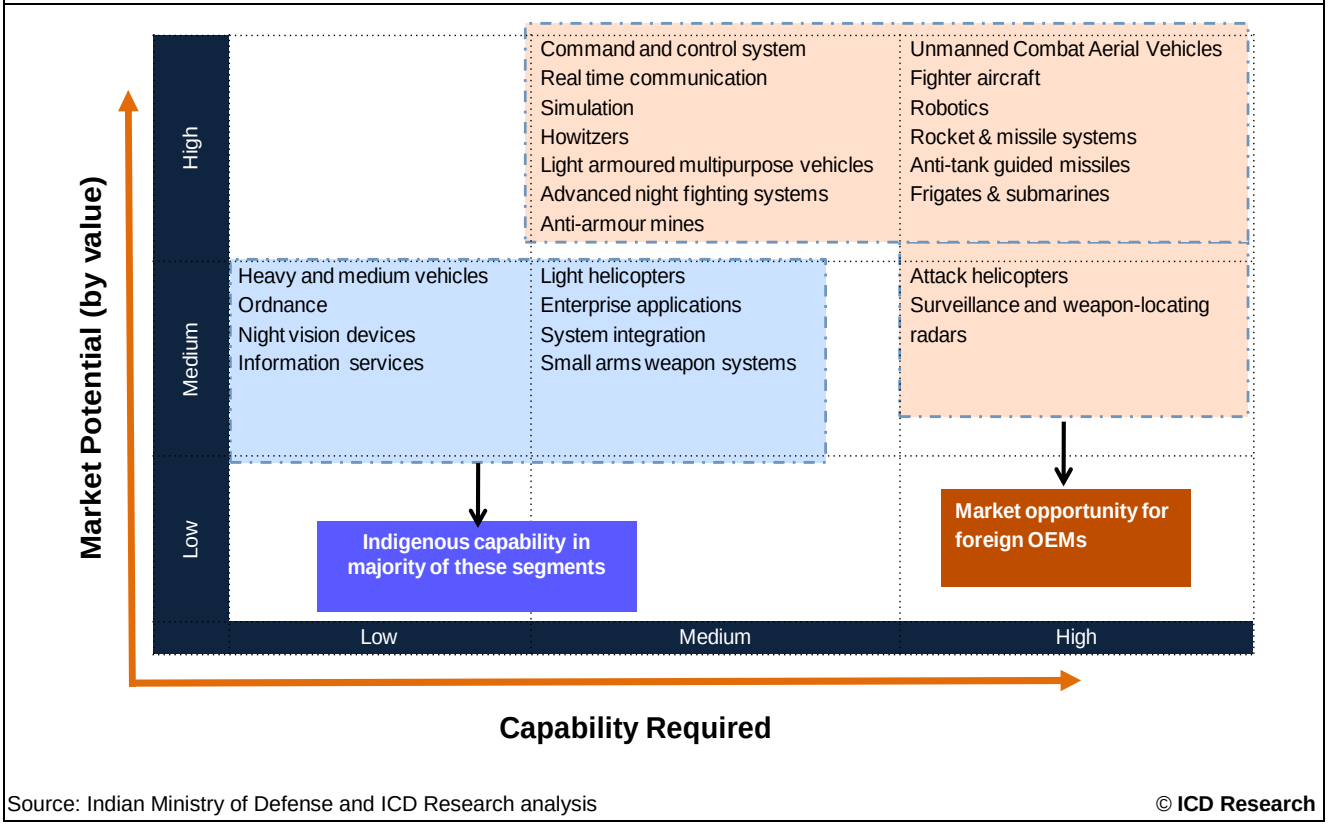
3.5.2 UCAVs, combat systems and fighter aircraft divisions to be areas of key growth

With the Indian defense industry focused on modernization and the upgrade of its ageing systems, there are many lucrative market opportunities that will emerge during the forecast period.

The following figure shows the key areas to target in the Indian defense industry

Figure 21: Indian Defense Industry – Key Areas to Target in the Forecast Period



Source: Indian Ministry of Defense and ICD Research analysis

Combat systems: The Indian army is evaluating a range of next-generation combat systems. As such, its F-INSAS (Futuristic Infantry Soldier as a System) program will be a key focus area. This program is focused on equipping infantry with the latest weaponry, communication networks and instant access to information on the battlefield. Key areas will include the following:

- Surveillance and weapon-locating radars
- Anti-tank guided missiles (ATGM)
- Armed attack helicopters (AAH)
- Anti-armor mines
- Small arms weapon systems
- Light armored multi-purpose vehicles, which combine mobility with protection, communication and reconnaissance
- Advanced night fighting systems

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Fighter aircraft: The Indian Air Force is expected to spend US$10 billion by 2013 on the purchase of 126 medium multi-role combat aircraft, which is contingent on successful trials. The first eighteen aircraft will be built outside the country, while the remaining aircraft will be assembled indigenously under a technology transfer agreement.

Rockets and missile systems: The current focus is on developing rocket systems in the range of 120–150 km along with multi-barrel rocket launcher (MBRL) systems in the 250–300 mm caliber class within the domestic market. For missile systems, the focus is on developing technologies for supersonic cruise missiles, short-range missiles, and long-range sub-sonic cruise missiles.

3.5.3 India to spend on UAVs during the forecast period

The Indian Ministry of Defense is expected to invest in the procurement of UAVs. These systems are expected to be utilized for surveillance and reconnaissance missions on the border regions, and are also being installed with weapons to perform combat operations which will enable the armed forces to perform combat operations without risking human life. India is spending on developing domestic UAV systems such as Netra, Rustom, Nishant and Aura. Also, India is spending for the procurement of established UAVs from foreign suppliers such as Israel.

During the forecast period, India is expected to procure Heron UAVs from Israel, which will be delivered during 2011–2013. India is also expected to invest in Rustom and Nishant UAVs. India requires tactical UAVs to be deployed Tamil Naidu and Andaman and Nicobar Islands. The country will develop Aura combat UAVs for Indian armed forces and is also procuring Harop UAVs from Israel to meet its urgent operational requirements.

3.5.4 India expected to replace its military helicopters

The Indian Ministry of Defense is also expected to acquire helicopters to perform its operations efficiently. The defense ministry is investing in the domestic development of helicopters such as light observation helicopters (LOH), light combat helicopters (LCH) and Dhruv helicopters. The Indian Ministry of Defense is procuring foreign helicopters such as Apache and Mi-17V5 medium-lift transport helicopters. These helicopters will replace the country's current Cheetah and Chetak helicopters, which have been serving the armed forces for a long period and are approaching the end of their service lives.

3.5.5 India expected to modernize its navy with frigates and submarines

The Indian Ministry of Defense is expected to spend for the acquisition of frigates, submarines, destroyers and corvettes to efficiently perform its naval missions. The rising naval power in the Asia-Pacific region, especially China, has forced India to modernize its naval forces. The Ministry of Defense is investing in surface combatants such as Shivalik frigate and Fremm frigates, as well as scorpene-class submarines to enhance its naval power.

Published: November 2011

4 Defense Procurement Market Dynamics

India's defense budget valued US$33.0 billion in 2010, of which US$13.1 billion was spent on procurement. As the defense industry is still in its early stages of development, nearly 70% of the country's defense goods are imported. However, the nation aims to attain self-reliance by procuring the majority of its defense requirements domestically. As such, spending on imports is estimated to constitute only 38% of the total procurement spending by 2016. In addition, India's defense exports are expected to increase in the future, as the government focuses on the transfer of technology, through joint ventures with foreign OEMs and investment in the country's research and development.

Published: November 2011

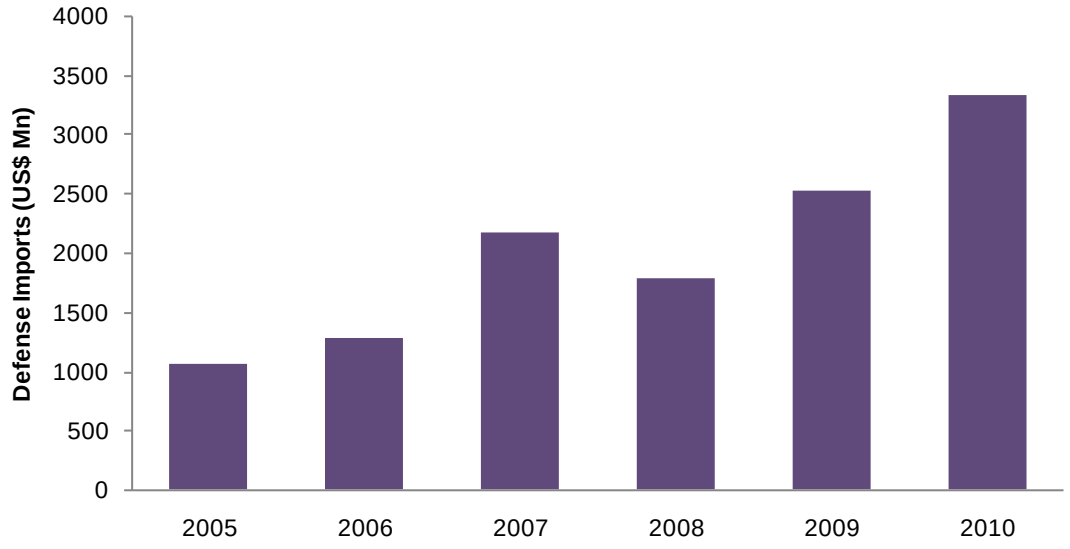
4.1 Import Market Dynamics

4.1.1 India was the largest arms importer during the review period

India's defense imports increased considerably during the review period, making it the largest global defense importer in 2010. The country's imports constituted 8.5% of the total global arms transfer in 2010. The government's modernization plans, combined with the external threats faced by India, have led to the country requiring a large amount of imports to fulfill its defense requirements. Since India's domestic defense industry is limited, India is expected to continue importing large amounts of its defense requirements over the forecast period.

The figure below shows the volume of Indian arms imports during 2005–2010:

Figure 22: Indian Defense Import Trend (US$ Million), 2005–2010 (TIV values*)



Source: SIPRI and ICD Research analysis

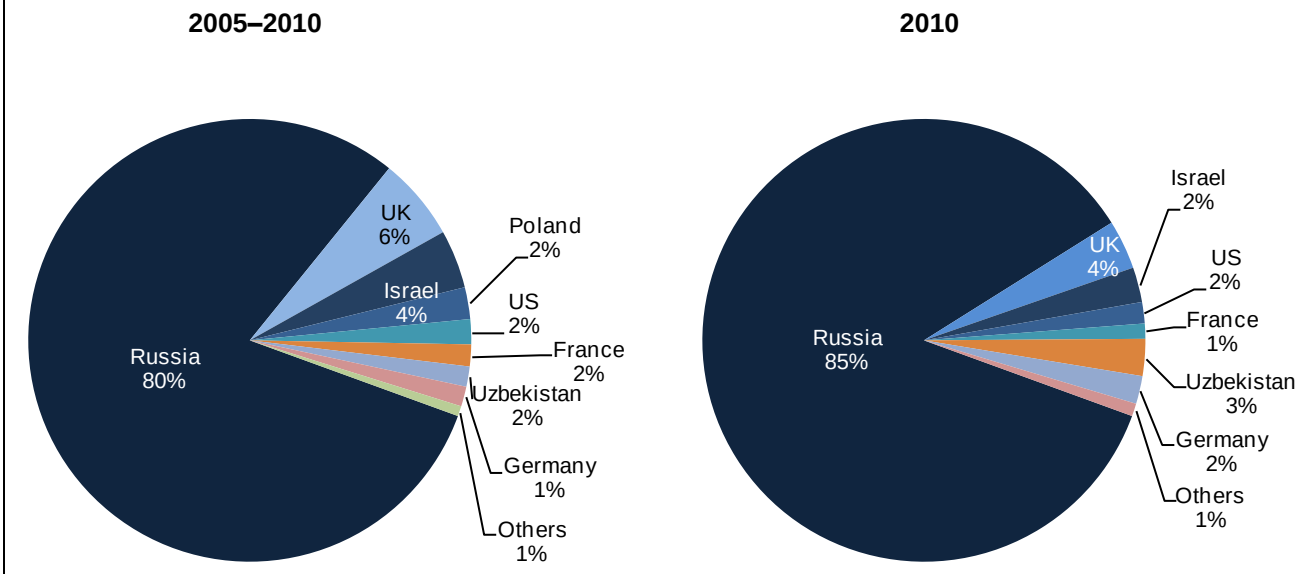
*Please note, the following figures are based on trend indicator values (TIV) expressed in US$ million at constant (1990) prices. Although figures are expressed in US dollars, TIVs do not represent the financial value of goods transferred. Instead, TIVs are an indication of the volume of arms transferred.

4.1.2 Russia dominates Indian arms imports

During the review period, Russia dominated the Indian defense market by providing the largest share of the country's defense imports. Russia accounted for 80% of the total defense market in India, while the UK accounted for 6% of the total arms market in India during the review period. By 2010, the import market share of Russia increased to 85% and the market share of UK reduced to 4%. Other countries which cater to Indian market for arms are Israel, France, Uzbekistan, Germany and US. Russia is expected to continue to dominate the Indian arms market during the forecast period. However, Russia's import share is expected to decrease as Israel and the US are expected to delivery more imports to India.

The figure below shows the source of Indian defense imports by country for 2005–2010 and 2010:

Figure 23: Country-wise Break-up of Indian Defense Imports (%), 2005–2010 (TIV values*), 2010



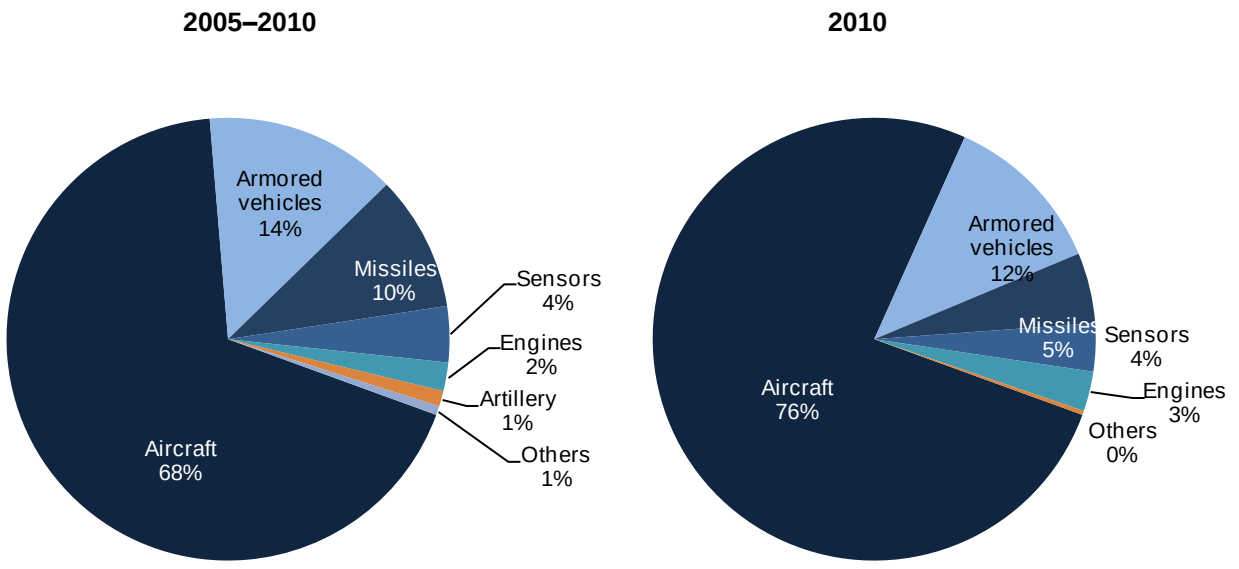
Source: SIPRI and ICD Research analysis

4.1.3 Aircrafts accounted for the majority of defense imports during the review period

The majority of India's defense imports were aircraft products, which accounted for 68% of the defense imports during the review period. Armored vehicles and missiles also accounted for significant share of the defense imports over the review period. In 2010, the share of aircrafts increased to 76% of the total defense imports of India, while armored vehicles accounted for 12% and missiles accounted for 5% of the total arms import market in India. Other defense imports included sensors, artillery and engines. Aircrafts are expected to continue to dominate the arms import market in India during the forecast period.

The figure below shows Indian defense imports by category for 2005–2010 and 2010:

Figure 24: Weapon Category Break-up of Indian Defense Imports (%), 2005–2010 (TIV values*), 2010



Source: SIPRI and ICD Research analysis

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4.2 Export Market Dynamics

4.2.1 India's low profile in defense exports is set to change over the forecast period

India's defense industry is still in its early development stage, and defense exports are limited to a few neighboring countries and less developed nations such as Mauritius, Bangladesh, Nepal and Indonesia. During review period, ships, aircraft and sensors were the three-most exported defense goods.

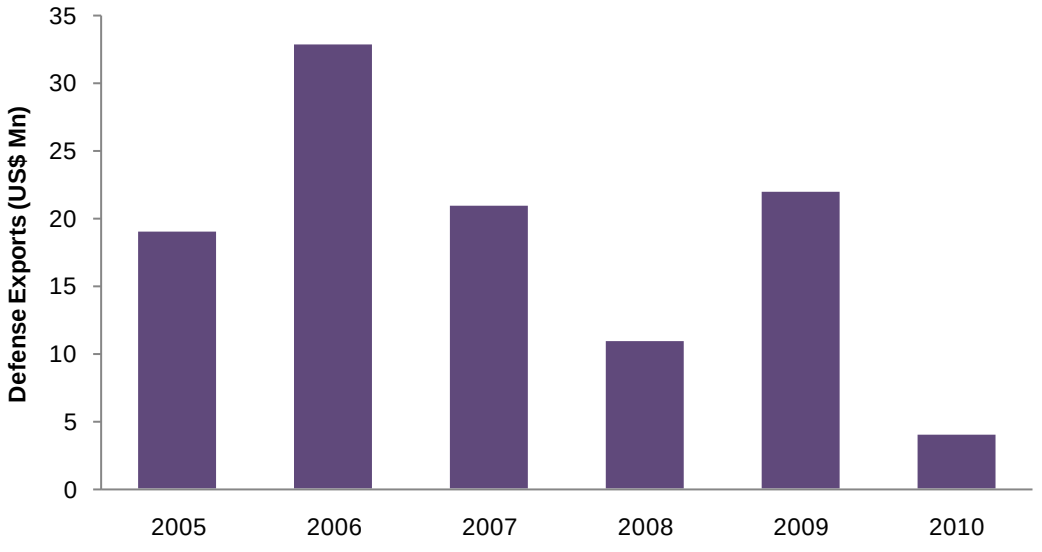
Currently, most of the defense exports in India are offered by public sector companies. Principle exporters include Bharat Electronics, Bharat Earth Movers, Ordnance Factories Board and Hindustan Aeronautics Limited (HAL). The country's main exports include military hardware such as rifles, rockets, radars, and domestically developed helicopters and planes such as the light transport aircraft, Dornier 228, the advanced light helicopter, Dhruv, and the light attack helicopter, Lancer.

Exports are expected to increase during the forecast period, in line with the growth in the private sector. During the forecast period, foreign OEMs will focus on meeting their offset norms through sourcing. Consequently, India could become the manufacturing and sourcing hub of these foreign OEMs. Major companies such as BAE Systems and Lockheed Martin are considering setting up a manufacturing center in India to serve the global market, which would lead to a significant increase in Indian defense exports.

The fall in defense exports in 2010 is due to the global economic crisis which is expected to recover over the forecast period.

The figure below shows the volume of Indian defense exports during the review period:

Figure 25: Indian Defense Export Trend (US$ Million), 2005–2010 (TIV values*)



Source: SIPRI and ICD Research analysis

Published: November 2011

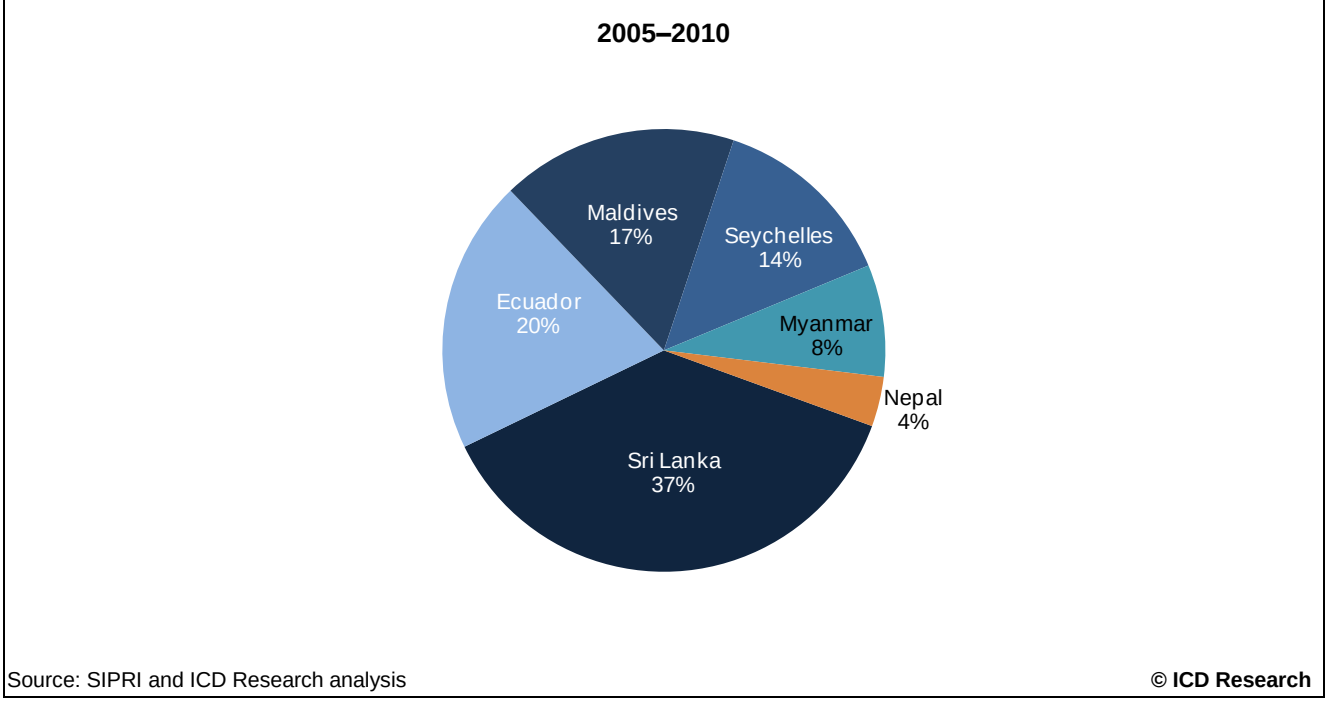
4.2.1 Underdeveloped nations across Asia, Africa and Latin America are the main importers of Indian defense goods

India's defense export value is currently very low compared to other nations with similar GDP, and India's export destinations are limited to a few neighboring countries and less developed nations such as Sri Lanka, Ecuador and Maldives. However, the country notably exported seven Dhruv helicopters to Ecuador during the review period. During the review period, the five largest importers of Indian defense equipment were Sri Lanka, Ecuador, the Maldives and the Seychelles.

During the forecast period, Bolivia is expected to become another major importer of Indian defense equipment, as the Bolivian Air Force, which currently uses American UH-1H Huey helicopters, is on the verge of completing its life term. With the Dhruv providing a state-of-the-art alternative to the UH-1H Hueys, at a price 25% cheaper than its alternatives, Bolivia is a potential buyer of these helicopters.

The figure below shows the volume of Indian defense exports by country during 2005-2010:

Figure 26: Country-wise Break-up of Indian Defense Exports (%), 2005–2010 (TIV values*),



Source: SIPRI and ICD Research analysis

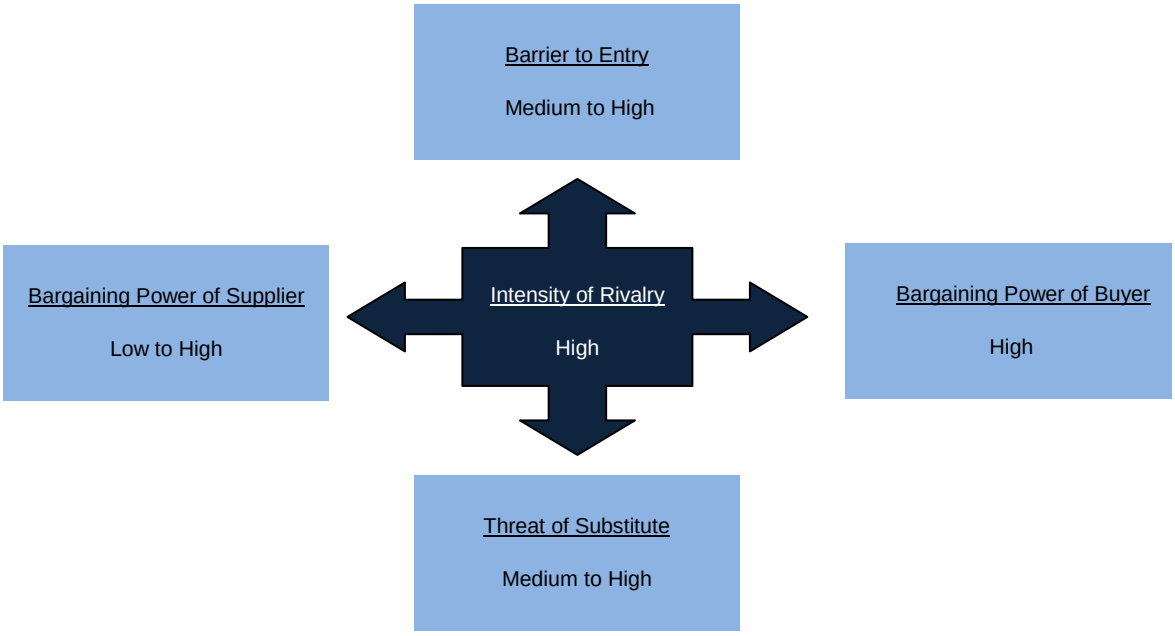
5 Industry Dynamics

5.1 Five Forces Analysis

The country's strong economic growth, combined with the threat of terrorism and volatile relationships with neighboring countries, will create a range of business opportunities in the Indian defense industry. The country's domestic defense industry currently only meets 30% of the country's material requirements, which provides numerous investment opportunities for foreign companies. India aims to enhance its domestic capabilities, in order that 70% of its requirements are met by domestic enterprises. In order to do so, the government is encouraging foreign OEMs to form joint ventures with Indian firms. However, as the FDI limit in Indian defense is restricted to 26%, the barrier to entry for foreign companies is medium to high.

The following sections provide a Porter's five forces analysis of the Indian defense industry:

Figure 27: Industry Dynamics – Porter's Five Forces Analysis



Source: ICD Research analysis

5.1.1 Bargaining power of supplier: low to high

The bargaining power of suppliers varies from low to high, depending on the level of sophistication of the military hardware and technology. At the lower end of the Indian defense industry, which comprises components and subassemblies, the market is highly fragmented, resulting in low bargaining power. At present, there are over 5,000 Indian suppliers, which account for nearly 25% of the public sector's components and subassemblies requirements. Most of these companies gain subcontracted work from large suppliers. The remaining supplies are sourced from foreign companies. The defense offset policy, which is designed to encourage domestic production, is expected to generate huge opportunity for the small- and medium-sized enterprises (SMEs). With relatively low entry barriers in terms of regulations and capability, a higher number of private companies are expected to enter the industry over the forecast period. This is likely to further reduce the bargaining power of suppliers.

The mid to higher tier of the defense supply value chain has relatively fewer companies when compared to the market size, giving them in high bargaining power. The Indian public sector has 39 ordnance factories spread across the country which make arms and ammunition, and eight state-owned companies manufacturing defense equipment. These companies mostly provide small arms, shipbuilding, aero-components and electronics, with a limited degree of sophistication, but enjoy monopoly power in their respective product offerings.

Niche and sophisticated military hardware such as aircraft, tanks, frigates, submarines, and missile systems command high bargaining power. However, this is affected by the high volumes of military hardware which the Ministry of Defense is seeking to procure. As a result, the bargaining power of domestic suppliers of these products will to remain subdued.

During the review period, there have been a number of domestic private sector and foreign companies entering India to gain a share of the rapidly growing defense industry. Moreover, any policy change increasing the FDI limit to 49% would further attract foreign OEMs. The expected increase in the number of companies is expected to put downward pressure on the bargaining power of suppliers.

5.1.2 Bargaining power of buyer: high

The Ministry of Defense is the sole buyer of military equipment in India and, as such, enjoys a monopoly on the industry. However, given India's low capability of indigenous manufacturing, the country relies heavily on imports. Despite this, the India's foreign policy and existing strategic alliances are able to influence defense deals, endowing the nation with a high bargaining power.

5.1.3 Barrier to entry: medium to high

The threat of new entrants to the Indian defense industry varies from medium to high, depending on the dynamics of the specific market division. At the lesser advanced technology end, there is a medium entry barrier, with relatively low levels of financial commitment, technological expertise and regulations.

However, in the more advanced tier, the complexity of the military hardware and technology in the division means that the entry barrier ranges from medium to high. This is due to a restricted FDI of 26%, which discourages foreign OEMs from entering the market, as well as the domestic companies' lack of technological expertise to enter the sophisticated product divisions, leading them to seek joint ventures with foreign companies.

5.1.4 Intensity of rivalry: high

The intensity of rivalry in the Indian defense sector is high due to the following factors:

- Too many firms chasing too few defense deals
- The low level of product differentiation, especially in the low and mid defense product markets
- Rivalry in the marketplace has been primarily among the foreign suppliers due to the limited presence of domestic companies and protected areas for state-owned defense establishments. There is a growing number of new entrants from the domestic private sector, which are seeking an increased share of the government's defense spending. As such, intensity of rivalry is set to increase.

5.1.5 Threat of substitution: medium to high

The threat of product substitution ranges from medium to high in the Indian defense industry, due to a number of factors. Firstly, the substitution threat within an individual category is high, with a range of products available. Switching to another product is primarily driven by features. For example, in the purchase program of medium multi-role combat aircraft (MMRCA), the Ministry of Defense has the option to select among several variants such as RSK's MiG-35, Boeing's twin-engine F/A-18 Super Hornet, and Lockheed Martin's F-16 fighter, Saab's Gripen, Eurofighter's Typhoon and Dassault's Rafale. Secondly, the expected growth in the Indian defense budget is set to increase the threat of substitution, with the armed forces opting for more sophisticated military hardware across different types of products.

Published: November 2011

6 Market Entry Strategy

6.1 Market Regulation

In its attempt to establish a self-reliant domestic provision of defense products and services, the Indian government has initiated a series of reforms. These reforms include the streamlining of defense acquisition procedures, allowing the private sector access to defense contracting, permitting foreign firms to invest in domestic defense firms, encouraging more joint R&D and production with foreign firms, and encouraging arms exports.

The following sections detail the key regulatory guidelines in the defense industry:

6.1.1 Defense Procurement Amendment 2009 (DPA): A significant improvement

The inadequacies of India's defense acquisition procedures were exposed during the Kargil war in 1999, which resulted in the introduction of significant defense reforms over the past decade. The new procurement procedures demand transparency in all defense related procedures. In its bid to improve these procedures, the Indian government formulated the Defense Procurement Procedure (DPP) 2002, which came into effect in December 2002.

The Indian Ministry of Defense has continued to review and update the DPP, introducing new reforms on an ongoing basis. For instance, the DPA 2009, effective from November 2009, has focused on the following two objectives:

- To increase the participation of domestic companies in defense procurement.
- To ensure transparency across all procurement procedures.

6.1.2 Offset policy to drive defense industrial modernization

In order to indigenize the defense industrial base of India, the Ministry of Defense introduced offsets under the DPP 2005, which was then further developed in 2006.

According to the offset clause written into the DPP 2006, if the transaction value of a defense deal exceeds US$66.4 million (INR3 billion), the foreign OEM must invest 30% of the deal's value back into the Indian defense industry. If the foreign OEM fails to comply, 5% of the value of the unfulfilled obligation will either be paid as a penalty, recovered from the bank guarantee issued under the main contract, or deducted from the amount payable under the main contract. Furthermore, the unfilled value is then carried over into the subsequent year.

The defense industrial base of India categorizes offsets as:

Buy (global): This involves outright purchase from a foreign vendor.

Buy and make with transfer of technology: This includes procurement from a foreign vendor, followed by licensed production.

Moreover, depending upon the category agreed upon, offsets can be classified as:

Direct offsets: Direct offsets require the supplier to purchase goods or make investments which are related to the industry of the primary transaction, thereby encouraging the growth of that specific industry. India has provisions for only direct offsets and, consequently, only procurements or investments in thirteen categories of defense products specified in the DPP 2008 qualify as offset.

Indirect offsets: Indirect offsets obligate the supplier to purchase goods or make investments from the purchasing country, which may be in a specifically stated industry or be entirely at the discretion of the vendor. Their purpose is to stimulate general economic growth in the vendor country.

Offsets in defense are used by many countries in order to improve their domestic capabilities or to enhance the country's economy by way of direct, as well as indirect, offsets

The table below outlines the key focus areas of the Indian defense offset program:

Table 18: Offset Regulations in India

Country	Minimum Transaction Value (US$ million)	Offset Range (%)	Multipliers	Penalty (%)	Area of Focus
India	65.9	30	None	5	Direct investment, R&D, technology transfer and sub-contracting.

Source: ICD Research analysis

6.1.3 Buy and make (Indian) category introduced to promote indigenization of defense related equipments

The DPP 2009 has focused on indigenizing the Indian defense industry. It has done this by introducing the new "buy and make (Indian)" category to the transfer of technology. According to the new procedure, Indian firms possessing the required financial and technical skills will be identified, and their project proposals considered, for transfer of technology with a foreign OEM. However, the product manufactured as a result of the alliance must contain at least 50% indigenous content.

The following highlights the specific details associated with the new buy and make category under the DPP 2009:

- The request for proposal (RFP) will be issued only to prospective domestic companies in both the public and private sectors.
- The prospective companies will directly negotiate with OEMs for the technology transfer and other production arrangements.
- Domestic companies must have at least 50% indigenous content in the total cost base.
- The public version of the long term perspective plan (LTTP) of the armed forces, covering a period of fifteen years, must be widely publicized. The plan must also outline the technology perspective and capability roadmap.
- There has been a liberalization of offset provisions by permitting changes to the offset partner.

Published: November 2011

- In order to enhance transparency, the amended guidelines have strengthened the provision of the integrity pact, which is a mandatory clause in procurement cases exceeding US$22 million (INR1 billion). In an integrity pact, both the government department and bidders resolve not to exchange bribes during the procurement process. The existing provision provides for appointment of independent monitors (IMs) in consultation with the Central Vigilance Commission. The role of independent monitors has been extended by allowing them access to the relevant office records in connection to the complaints sent to them by the buyer

6.1.4 Private sectors permitted to produce arms and ammunition under the new Draft Arms and Ammunitions Manufacturing Policy (DAAM)

The DAAM has been issued by the Ministry of Home Affairs (MHA) in order to regulate the production of arms and ammunition in the private sector. The following highlights the key points under DAAM:

- The private sector is permitted to manufacture arms on a limited basis only and on the issuance of an industrial license by the Department of Industrial Policy and Promotion (DIPP).
- DIPP licenses are only issue to private companies agreeing to invest US$11 million (INR500 million), subject to maximum 26% FDI and equipped with advanced manufacturing capabilities. The draft policy also prohibits the participation of small business units in arms and ammunition manufacturing.
- The supply of arms and ammunition is restricted to the Central Paramilitary Forces, and Defense and State Governments on a tendering or export basis. Sports weapons and non-prohibited bore (NHB) weapons can, however, be sold to license holders through registered arms dealers.
- The manufacturing quota of existing firms will not be enhanced.
- DIPP has the authority to make changes in the draft policy as and when required.

To ensure adherence to these norms, the District Magistrates of the relevant areas have been authorized to conduct inspections and file reports to the secretaries at both state and central levels.

6.1.5 Payment to foreign technology partners does not require governmental approval

In December 2009, the Indian government reviewed and updated its existing defense approval policy in order to provide foreign technology partners with automatic approval for transfers involving fees of US$2 million or more, with payment of royalties of 5% on domestic sales and 8% on exports. In addition, where there is no technology transfer involved, there is automatic approval for royalties of up to 2% for exports, and 1% for domestic sales, for use of the trademarks and brand names of the foreign collaborator.

All such payments will be subject to foreign exchange management (current account transactions), the rules of which are amended from time to time.

6.1.6 Foreign direct investment limited to 26% in the Indian defense sector

The draft FDI regulatory framework released by the Indian Ministry of Commerce in December 2009 preserves the limit in the defense sector at 26%, under the approval route and subject to industrial license through the Industries Development and Regulation Act 1951.

The framework proposes to specify conditions for FDI in the homeland security division based on the Private Security Agencies (Regulation) Act. The key details of this act are as follows:

- The applicant must either be an Indian company or be in partnership with an Indian firm.
- Only a firm registered in India is eligible for licensing.
- The applicant firm's Chief Executive Officer (CEO) must be an Indian.
- The applicant company must have a majority of Indians on its board.

Published: November 2011

6.2 Market Entry Route

6.2.1 Foreign OEMs are forming joint ventures in order to enter the market

Over the review period, foreign OEMs have been forming joint ventures and setting up operations in India to enter the defense market, instead of opting for the conventional route of selling defense equipment as imports from an overseas location. Government regulation only allows foreign players a maximum equity holding of 26%. Despite this, the number of foreign companies entering the Indian defense industry through joint ventures has increased over time. The main reason for this increase is the awareness that the Indian defense industry is growing strongly, and the expectation that forming a joint venture will bring future benefits as the country looks to procure defense equipment domestically. Furthermore, gaining a domestic market presence will become important in order to take advantage of market opportunities as they emerge in the future.

The following table details the main foreign companies that have entered the Indian defense industry, and the entry strategy they used to do this:

Table 19: Market Entry Strategies and Key Objectives of Foreign Companies in the Indian Defense Sector

Company	Country of Origin	Year	Entry Strategy and Strategic Objectives
General Electric	US	2009	**Entry Strategy:** Formed a joint venture agreement with Bangalore-based, Wipro Infotech. **Strategic Objective:** To expand its security offerings in the Indian market. The alliance will work towards improving physical security aspects in the country, especially for socio-economic zones, campuses, enterprises, the hospitality industry and other sensitive installations.
SAAB	Sweden	2009	**Entry Strategy:** Established an office in New Delhi. **Strategic Objective:** To enhance its presence in the Indian defense market by providing support to its customers. This initiative will also enable the company to market its defense products in India.
Raytheon	US	2007	**Entry Strategy:** Entered into an agreement with Tata Power Strategic Electronics Division. **Strategic Objective:** To focus on India as a strategic partner and to forge partnerships with both private and public Indian companies. Since 2007, the company has continued to form strategic alliances with eight other Indian companies.
General Dynamics	US	2004	**Entry Strategy:** Acquired TriPoint Global Communications Inc. **Strategic Objective:** To actively pursue government and defense supply deals. At present, the company is seeking opportunities in the fields of communications, specialized vehicles for the defense and paramilitary forces, armaments, ammunition, rugged computing, naval systems and special mission aircraft.
Thales	France	2003	**Entry Strategy:** Established Thales India Private Ltd, a wholly owned subsidiary of Thales Group. **Strategic Objective:** The Indian armed forces have used Thales' products since 1953. In order to deliver reliable and high-level support services to its various customers in India, the company created Thales India Private Ltd.
Ness Technologies	Israel	1999	**Entry Strategy:** Primarily ventured into the Indian software market via its three business divisions: Ness NA (North America), Ness IBS (Innovative Business Services) and Ness UK Mumbai Centre. **Strategic Objective:** To tap into India's rapidly developing defense

Table 19: Market Entry Strategies and Key Objectives of Foreign Companies in the Indian Defense Sector

			industry by offering command and control systems with cutting edge technology, catering to the defense and homeland security markets. **Entry Strategy:** Inherited a New Delhi office as a result of its corporate merger with Martin Marietta in 1995. The office in India was relocated in 2005 to ensure better support for marketing teams in the US. **Strategic Objective:** Within a year of its inception, the company strived to establish its brand within the Indian military circles. The company intends to obtain defense deals worth US$15 billion from India by 2015, by focusing on the following opportunities: **Near term opportunities:** P-3C Orion, MH-60R, C-130J, F-16, integrated platform management system (IPMS), low-level transportable radar (LLTR), vessel traffic management system (VTMS). **Long term opportunities:** C4ISR-related requirements, PAC-3, Anti-Tank Guided Missile (ATGM), Longbow Hellfire. **Miscellaneous:** Littoral Combat Ship (LCS), VLS Mk 41 launcher, Aegis weapon system and Census.
Lockheed Martin	US	1995	
BAE Systems	UK	1993	**Entry Strategy:** Established BAeHAL, a joint venture with Hindustan Aeronautics Limited (HAL). **Strategic Objective:** To provide IT solutions and services to the aerospace, defense, transport and engineering industries.
EADS	Netherlands	1962	**Entry Strategy:** Eurocopter, the EADS-owned helicopter manufacturer, formed a technology transfer agreement with HAL for the manufacture of the 600 Chetak and Cheetah helicopters under license. **Strategic Objective:** To penetrate the rapidly developing Indian aerospace and defense industries. The company also plans to establish training centers for pilots and mechanics, as well as maintenance and spare part distribution centers.
Rolls Royce	UK	1956	**Entry Strategy:** Entered into a license production partnership with Hindustan Aeronautics Limited (HAL). The two companies entered into a technical assistance agreement (TAA). **Strategic Objective:** To develop affordable aero engineering solutions, including engineering analysis and design, and to utilize the capabilities of the Indian market.

Source: ICD Research analysis

6.2.2 India emerges as a key outsourcing hub for global defense companies

In addition to preparing for future market potential, these companies are also setting up exports and outsourcing bases as long-term strategies to serve global markets. This is being encouraged by India's proven expertise in outsourcing for a range of industries and areas requiring high competency levels.

The following table gives an overview of key players and their presence in the Indian defense industry:

Table 20: Key Players and their Operations in the Indian Defense Industry

Company	Supplies from Overseas	In Joint Venture or Alliance with Indian Firm	Manufacturing or Outsourcing Base in India	
			Presently has	Expected to setup
BAE Systems	✓	✓		✓
EADS	✓	✓		
Lockheed Martin	✓	✓		✓
Thales	✓	✓	✓	
SAAB	✓	✓		✓
GE	✓	✓	✓	
Rolls Royce	✓	✓	✓	
Honeywell	✓	✓	✓	
Ness Technology			✓	

Source: ICD Research analysis

6.3 Key Challenges

Although the opportunities apparent in the Indian defense market make it a highly attractive market to enter, the comparatively strict regulatory regime, combined with inefficient bidding and production processes, pose challenges for foreign investors. The following sections identify the key challenges associated with the Indian defense industry:

6.3.1 Offset policy with restricted FDI of 26% is biased towards the domestic public and private sectors

Introduced under the DPP 2005 and developed further in 2006, the offset policy encourages the indigenous Indian defense industry to play a major role in meeting the needs of the armed forces by restricting FDI to 26%. It is expected that small- and medium-sized enterprises will benefit from the offsets, leading to a larger presence of private companies in the defense industry.

Furthermore, if the Defense Acquisition Council selects a project under the buy and make (Indian) category, Indian public and private firms will play a key role in negotiating and obtaining the technology and co-production arrangements with foreign OEMs. Therefore, the request for proposal will be issued to the Indian firms and not to the foreign OEMs. This has led to allegations that the defense offset policy is biased toward the domestic public and private sector firms and works against international vendors.

The critical area of concern for foreign companies is the offsets in defense, which have been placed at 30% and, in some cases, such as the Medium Multi-Role Combat Aircraft (MMRCA), even reach 50%. Managing these offsets will continue to be the biggest challenge for foreign companies, particularly when considering the low FDI limit.

Finally, the future of the Indian defense industry relies on the advancement of its technological expertise, and this can only take place if the foreign partner has a long-term stake in the company. However, current policy does not provide foreign investors with incentives in terms of capacity expansion, purchase guarantees and exports, but subjects them to purchase and price discriminations through public sector enterprises.

6.3.2 Insufficient information and transparency on future plans

Insufficient information and the lack of clear future plans have been a key challenge for both the private sector and foreign companies in planning the development of research and development technology or the formation of joint ventures. Although the Ministry of Defense has agreed to provide a public version of the long-term plan, its effectiveness remains to be seen.

One of the key objectives of DPP 2009 is to enable transparency and integrity in all acquisitions of the defense industry. To ensure this, the government will prepare a public version of the fifteen-year Long-Term Acquisition Plan of the armed forces, which should help the industry to identify future technological requirements and take the relevant action to develop their in-house capabilities. This will be displayed on the Ministry of Defense's website and shared with industry associations. Apart from putting up all requests for information on its website, the ministry will also invite industry representatives for consultations during high-level procurement meetings, before a decision is taken for procurement of any defense weapons or equipment.

Published: November 2011

6.3.1 Bureaucracy, corruption and long project delays

Since the early 1970s, the Indian defense procurement process has included corruption, delays and bureaucratic hurdles, due to the monopoly of the civilian bureaucracy and politicians over the purchase decisions of the armed forces. Indeed, although the armed forces are in charge of conducting trials on shortlisted equipment and forwarding their recommendations to the Ministry of Defense, any financial negotiations are conducted by civilian officials. This gives rise to the opportunity for corruption, by way of bribes and collecting money for election funds.

Although India is one of the only countries to ban middle-men and brokers from operating, they are unofficially involved in almost every deal negotiated with international companies for the importation of defense equipment. Moreover, in many cases, equipment trials and negotiations drag on for decades. For instance, the IAF's acquisition of advanced jet trainers (AJTs) has been delayed by nearly a quarter of a century. Although the requirement for Hawk trainers was raised by the air force in the early 1980s, the deal could only be signed with BAE in March 2004, with the delivery of the first aircraft in 2009.

In fact, the armed forces are consistently unable to completely expend their annual capital budget because of the procedures that discourage the participation of international OEMs, which often lose patience with the delayed proceedings.

6.3.2 Developing advanced low-cost solutions is essential to gain market share

In order to cater to the Indian defense industry, it is essential that companies develop advanced low-cost technology solutions. This is especially true in the mid tier, where the degree of sophistication is not as high as it could be. Due to low labor and infrastructure costs, defense products developed in India are generally very competitively priced, compared to imports. An example of this is HAL's advanced light helicopter, the Dhruv, which only costs US$5 million, one-third of the price of similar helicopters available from mature markets. Last year, HAL securing a notable order for seven Dhruv helicopters from Ecuador, despite intense competition from international vendors such as Bell and Sikorsky.

Published: November 2011

7 Competitive landscape and Strategic Insights

7.1 Competitive landscape Overview

The Indian defense industrial base has been aiming to procure 70% of its defense requirements from domestic companies since 2000, but, as of 2009, the country only procured 30% of its defense equipment domestically. The unremarkable performance of domestic enterprises has compelled the government to encourage joint ventures between domestic corporations and foreign manufacturers. Furthermore, the government has begun to realize the benefits of private sector involvement in the country's defense industrial base.

7.1.1 Domestic public companies have a strong presence in the Indian defense industry

Although the Indian defense industry began to invite private sector participation in 2001, the FDI limit of 26% means that the country's defense industrial base continues to be dominated by state-owned enterprises. As a result, private sector companies such as Mahindra Defense Systems, L&T, Rolta India and Tata Advanced Systems have been forced to enter the market through joint ventures and strategic alliances with foreign OEMs. These companies have been primarily focusing on the homeland security market, as the capability of the domestic public companies is limited in this area.

The following table gives details of the scale of operations of various domestic public companies:

Table 21: Scale of Operations of Domestic Public Sector Companies in the Indian Defense Industry

Company	Scale of Operations	Air Defense Systems	Naval Defense System	Land Defense System
Larsen & Toubro	INR414.9 billion (US$9.2 billion)	• Missile systems • Defense electronics and control systems • Avionics and test systems • Electronic warfare systems • Military communication systems • Unmanned aerial vehicles (UAVs)	• Integrated naval combat systems • Integrated naval engineering equipment and systems. • Missile systems • Complete naval vessels • Defense electronics and control systems • Electronic warfare systems • Military communication systems	• Integrated land-based systems • Missile systems • Defense electronics and control systems • Military communication systems • Electronic warfare systems • Military communication systems
Tata Motors	INR295.3 billion (US$6.7 billion)			• Logistic vehicles • Tactical vehicles • Homeland security – police and paramilitary
Wipro	INR255.4 billion (US$5.7 billion)	• Safety critical systems • On-board or non-critical systems		• Ground systems

Published: November 2011

Table 21: Scale of Operations of Domestic Public Sector Companies in the Indian Defense Industry

		• Mechanical engineering services for aerospace		
Infosys	INR216.9 billion (US$4.8 billion)	• Aircraft design and development • Avionics system development		
HAL	INR103.7 billion (US$2.7 billion)	• Aircraft • Helicopters • Accessories for aircraft, helicopters and aero engines • Aero engines • Aerospace equipment • Communication and navigation equipment	• Communication and navigation equipment	• Communication and navigation equipment
BEL	INR52.7 billion (US$1.2 billion)	• Airborne radars • Electronic warfare systems • Air defense control and reporting systems • AKASH air defense missile systems	• Shipborne radars • Sonar • Fire control systems • Electronic warfare systems • Simulators	• Communication equipment • Land-based radars • Opto-electronic devices • Electronic warfare systems • Weapon systems • Tank electronics • Simulators • Tatra vehicles • Armored recovery vehicles
BEML	INR30.1 billion (US$670 million)	• Aircraft weapon loading trolleys • Aircraft towing tractors		
Mazagon Dock Limited	INR25.7 billion (USD$571 million)		• Naval ships	
Rolta	INR14.4 billion (US$320 million)			• Command, control, communications, computers, intelligence, surveillance, target acquisition and reconnaissance (C4ISTAR) • Homeland security-related products • Vehicle systems • Digital soldier

Published: November 2011

Table 21: Scale of Operations of Domestic Public Sector Companies in the Indian Defense Industry

				systems
Goa Shipyard Limited	INR5.9 billion (US$132 million)		• Vessels • Missile craft • Fast-attack craft • Interceptor craft • Simulators	
Bharat Dynamics Limited	INR4.6 billion (US$102 million)	• Air defense missile systems • Counter measure dispensing systems • Infrared interference indicators • Advanced light weight torpedoes	• Counter measure systems for submarines • Infrared interference indicators • Advanced light weight torpedoes	• Land defense missile systems • Infrared interference indicators

Source: ICD Research analysis

7.2 Key Foreign Companies

7.2.1 Lockheed Martin Corporation – overview

Lockheed Martin Corporation (Lockheed Martin) is a security and information technology company, which conducts design, R&D, manufacture, integration and maintenance of advanced technology systems, products and services. The company is headquartered at Bethesda, Maryland, and primarily serves US government agencies.

The Indian defense industry has been one of the company's key global markets, and it hopes to secure deals worth US$15 billion in the industry by 2014–2015. In one of the largest arms deals ever made by a US company, Lockheed Martin sold six C-130J military transport planes to India for US$1 billion in 2008.

7.2.2 Lockheed Martin Corporation – main products

The key products offered by the company include:

Table 22: Lockheed Martin Corporation – Main Products

Products
Aircraft
Combat aircraft (F-16IN Super Viper)
Transport planes (C-130J-Night Warrior: a four-engine turboprop military transport aircraft)
Fighter aircraft (F-35 Lightning II joint strike fighter: with a short takeoff and vertical landing capability for aircraft carrier operations).
Patrol aircraft (P-3C Orion)
Helicopters
Multi-mission helicopters (MH-60R: the multi-mission helicopter is designed to provide the Navy with war-fighting systems, which make it possible to fly and fight in high density, information intensive, littoral and open-ocean maritime environments).
Radars
Ground and airborne radars
Weather radars
Missiles
Patriot Advanced Capability-3 (PAC-3 missiles: PAC-3 is a terminal air defense missile).
Combat-proven weapon systems (HELLFIRE II Missile: this missile system targets in the presence of severe electro-optical countermeasures, with minimal collateral damage. It can be launched from air, sea, or ground platforms, either autonomously or with remote designation).
Communication systems
Integrated platform management systems: provides comprehensive data collection, integration and access for all mail processing equipment and material handling equipment
Vessel Traffic Management System (VTMS): provides solutions to vessel traffic management. It also monitors ports and coastlines, protects assets, and supports search and rescue missions

Published: November 2011

Other defense products
Littoral Combat Ship (LCS), VLS MK 41 launchers, Aegis weapon systems, census and civilian air traffic control upgrade programs

Source: Annual report, company website, primary and secondary research © ICD Research

7.2.3 Lockheed Martin Corporation – recent announcements and strategic initiatives

September 2011: The company successfully delivered the fifth of six C-130J Super Hercules on order for the Indian Air Force

June 2011: Lockheed Martin delivered the third and fourth of six C-130J Super Hercules for the Indian Air Force

February 2011: The Indian air force celebrated the induction of its first Lockheed Martin C-130J Super Hercules to service

October 2010: The company announced that the first of six C-130J Super Hercules for India took commenced its maiden flight.

September 2010: The company extended support for the landmark Indian Innovation Growth Program, which boosts Indian technical breakthroughs by helping transition them to market.

May 2009: Lockheed Martin announced that it is considering outsourcing its production of the Aegis Missile Defense System to India.

July 2007: The company contemplated outsourcing part of its research and development and production work to India for its global markets

7.2.4 Lockheed Martin Corporation – alliances

Table 23: Lockheed Martin Corporation – Alliances

Alliance	Partner Company	Year Formed	Strategic Objectives and Focus Area
Joint venture	Tata Advanced Systems Ltd	2011	• **Product Focus:** To make aero structures for Lockheed's C-130 aircraft in India. • **Market Focus:** India.
MoU with BEL	Bharat Electronics Ltd	2007	• **Product Focus**: Aerospace and defense electronics requirements. • **Market Focus:** India and international markets.
Partnership with Larsen and Toubro	Larsen and Toubro	2007	• **Product Focus:** Integrated platform management system for Indian Navy's ship building program, which includes one aircraft carrier and over thirty ships for various applications. • **Market Focus:** India.
Joint venture with HAL	Hindustan Aeronautics Ltd	2005	• **Product Focus:** The alliance will allow the companies to form a technical assistance agreement related to the P-3 Orion maritime surveillance aircraft program, involving airframe

Table 23: Lockheed Martin Corporation – Alliances			
			component design, manufacturing and overhaul. • **Market Focus:** India.
Joint venture with Mahindra Defense Systems (MDS)	Mahindra Defense Systems	2003	• **Product Focus:** To develop simulators for the Indian defense forces. • **Market Focus:** India.

Source: Company website and ICD Research analysis

7.2.5 Lockheed Martin Corporation – recent contract wins

Table 24: Lockheed Martin Corporation – Recent Contract Wins			
Date	**Contract Value**	**Client**	**Description**
Feb 2008	US$1 billion	Indian Air Force	Indian Air Force acquired six C-130J Hercules military transport aircraft.

Source: Company website and ICD Research analysis

7.2.6 Lockheed Martin Corporation – financial analysis

Not available.

7.2.7 BAE Systems Plc – overview

BAE Systems Plc (BAE) is a contractor and systems integrator for the global defense, security and aerospace markets. The company provides the design, manufacture and support of military aircraft, space systems, surface ships, submarines, avionics, radars, C4ISR systems, electronic systems and guided weapon systems. The company is headquartered in London, UK, and has over 107,000 employees.

The company established its first formal presence in India in 1993, when it entered into a joint venture with Hindustan Aeronautics Ltd (HAL).

7.2.8 BAE Systems Plc – main products and services

The key products offered by the company are:

Table 25: BAE Systems Plc – Main Products and Services	
Products	**Services**
Unmanned aerial vehicles (UAVs)	Not available
HERTI: a platform-based UAV.	
MANTIS: a medium-altitude long-endurance UAV.	
Aircraft	
Combat aircraft (Typhoon: a combat aircraft which provides the air-to-air and air-to-surface mission profiles; Harrier GR9: a single seat, multi-role combat aircraft that is capable of operating at night and at a low level. It also operates from a wide selection of locations, including deployed air bases and	

aircraft carriers). Advanced jet trainers (Hawk: has been developed to provide training for fourth and fifth generation aircraft such as Typhoon, F-35 Lightning II and F18). **Land system** M777 155 mm lightweight field Howitzer: a 155mm 39 caliber towed gun which meets the requirement for rapidly deployable artillery fire support. Armored vehicles **Engineering services and software testing** Simulation product (Multifunction Information Distribution System (MIDS) interface simulator): MIDS interface simulator is a tool used for integrating MIS and the operational flight hardware and software
Source: Annual report, company website, primary and secondary research **© ICD Research**

7.2.9 BAE Systems Plc – recent announcements and strategic initiatives

November 2009: The company successfully delivered the 24th and final contracted UK built Indian Hawk.

March 2009: The Indian Air Force shelved plans to procure forty more Hawk advanced jet trainers and circulated new tenders instead, due to reported problems with the supply of shares.

February 2009: BAE System contemplated setting up an export base in India to manufacture a range of defense equipments

7.2.10 BAE Systems Plc – alliances

Table 26: BAE Systems Plc – Alliances

Alliance	Partner Company	Year Formed	Strategic Objectives and Focus Area
Joint venture with M&M	Mahindra & Mahindra (M&M)	2009	• **Product Focus:** The armoring of Rakshack vehicles, axe vehicle production, and to start the process of developing a mine-resistant ambush protected vehicle suitable for India. • **Market Focus:** Primarily Indian, with some focus on overseas markets. • **Revenue Insights:** Bidding for mine-resistant armored vehicles and 155-mm howitzers. Has a revenue target of INR20 billion (US$444 million)
BAeHAL Software Limited	Hindustan Aeronautics Ltd (HAL)	1993	• **Product Focus:** Real-time projects, simulation, engineering services and software testing for aerospace and defense companies. • **Market Focus:** Caters to both Indian and overseas markets. • **Revenue Insight:** Finalized software projects worth US$40 million in 2009.

Source: Company website and ICD Research analysis **© ICD Research**

7.2.11 BAE Systems Plc – recent contract wins

Table 27: BAE Systems Plc – Recent Contract Wins

Date	Contract Value	Client	Description
July 2010	GBP500 million (US$765 million)	HAL	To supply products and services to enable a further 57 Hawk Advanced Jet Trainer (AJT) aircraft to be built under license in India. Of these, 40 aircraft are for the Indian Air Force and 17 aircraft are for the Indian Navy.
March 2010	Not available	Indian Navy	To develop the mission computer system suite for the P-8I aircraft for the Indian Navy

Source: Company website and ICD Research analysis

7.2.12 BAE Systems Plc – financial analysis

Not available.

7.2.13 Thales – overview

Thales provides technology for the aerospace, space, defense, security and transportation markets. With operations in 50 countries, the company is a leading defense contractor and a major player in civil and commercial markets. Its businesses are organized by two market divisions: aerospace and space, and defense and security.

Thales, which has been in operation in India for more than fifty years, currently has over 230 employees in several locations, with main offices in Chennai and New Delhi.

Although Thales has been established in India since 1953, the company has increased its market presence during the review period, as it aims improve its services to Indian customers by reducing downtime. The group has a long-term partnership with the Indian armed forces and has a foothold in the civil domain, providing aerospace and security products. Thales activities in India include program management, installation, integration, commissioning, validation, warranty and maintenance support, and training and logistics. It also provides equipment systems and support for numerous platforms, in service with the country's land, air and naval forces.

7.2.14 Thales – main products and services

The key products offered by the company are:

Table 28: Thales – Main Products and Services

Products	Services
Avionics	Not available
Cathode ray tubes (CRT) for the spectrum of airbus civil and military aircraft.	
Helmet mounted sight and display (HMSD).	
Multi-functional displays (MFDs).	
Commander suite	
Offers integrated command, control, communication,	

computers, intelligence, surveillance, target acquisition and reconnaissance (C4ISTAR) solutions.
Radar
AN/TPQ-37 fire finder radars.
Long-range low-level radars.
Low-level transportable radars.
LWO8 systems.
Optronics solutions
Thermal cameras
Submarines
Small arms trainers
Sagittarius: the Sagittarius product line covers areas of small arms training ranging from civil and law enforcement applications to military battlefield engagement
Source: Annual report, company website, primary and secondary research **© ICD Research**

7.2.15 Thales – recent announcements and strategic initiatives

Nov 2009: Thales responded to the request for proposal circulated by the Centre for Airborne Systems (CABS), which was looking for a foreign partner for its INR18 billion (US$400 million) airborne early warning and control system (AEW&CS) program

7.2.16 Thales – alliances

Table 29: Thales – Alliances

Alliance	Partner Company	Year Formed	Strategic Objectives and Focus Area
Cooperation	Dassault	2011	• **Strategic Focus:** Supplying the RDY-3 radar, navigation and attack equipment, and electronic countermeasures for India's 51 Mirage 2000 fighter aircraft
MoU	Axis Aerospace & Technologies	2011	• **Strategic Focus:** To establish a world class flight training centre at Devanhalli Aerospace Park, adjacent to the new Bangalore International Airport.
BEL-Thales	Bharat Electronics Limited	2009	• **Product Focus:** To manufacture radars. • **Market Focus:** India.
Samtel Thales Avionics Pvt Ltd	Samtel Display System	2008	• **Product Focus:** To develop, produce, sell and maintain Helmet mounted sight and display (HMSD) systems and other avionics systems. • **Market Focus:** India.
Thales-Tata Power	Thales and Tata Power SED(Strategic Electronics Division)	2008	• **Product Focus:** To offer optronic solutions. • **Market Focus:** India.
Dassult, Thales and HAL	Dassault, HAL	2007	• **Product Focus:** To upgrade the existing fleet of Mirage 2000. The proposed upgrade was based on the RDY-2 radar and is an adaptation of the existing 2000-5 Mk2 and 2009. • **Market Focus:** India.
Rolta Thales Ltd	Rolta	2006	• **Product Focus:** To develop communication and information software systems for defense and homeland security. • **Market Focus:** India and international markets.

Table 29: Thales – Alliances

Source: Company website and ICD Research analysis

7.2.17 Thales – recent contract wins

Table 30: Thales – Recent Contract Wins

Date	Contract Value	Client	Description
July 2011	US$1.42 billion	Indian Air Force	Supply the RDY-3 radar, navigation and attack equipment, and electronic countermeasures for India's 51 Mirage 2000 fighter aircraft
March 2010	Not available	MiG (RSK-MiG)	To deliver IFF1 Combined Interrogator Transponder (CIT) and Cryptographic National Secure Mode (NSM), for the retrofit of the MiG-29 multi-role fighter aircraft of the Indian Air Force
February 2009	US$100 million	The Indian Ministry of Defense	To provide 20 low-level transportable radars (LLTRs). The contract also states that the LLTRs will be made by Bharat Electronics Limited, under transfer of technology.
December 2008	Not available	The Indian Air Force	To provide fifteen small arms training simulators from the Thales Sagittarius product range, manufactured in India.
July 2008	Not available	Bharat Electronics Limited	To provide components for three LWO8 systems to be installed in the Godavari class frigates. The radars were manufactured by BEL, under a license agreement with Thales, before being delivered by the end of 2009.
February 2008	Not available	Indian Army	To install advanced fire control systems and night vision devices on 1,000 frontline T-90 tanks in the Indian army. The system, built in collaboration with Belarusian company, Beltech International, had already been installed in 600 T-90 tanks. The company also received a new order for 320 thermal images.
October 2005	US$747.2 million	The Indian Government	Armaris, a joint venture between Thales and DCN, was chosen by the Indian government for its technology transfer program, under which six conventionally propelled Scorpene submarines are to be built in India.

Source: Company website and ICD Research analysis

7.2.18 Thales – financial analysis

Not available

 Published: November 2011

7.3 Key Public Sector Companies

7.3.1 Mazagon Docks Limited – overview

Mazagon Docks manufactures warships and submarines for the Indian Navy. The company also manufactures offshore platforms and associated support vessels for offshore oil drilling, for both domestic and overseas clients. Incorporated as a public limited company in 1934, the company was taken over by the Indian government in 1960. Mazagon Docks is headquartered in Mumbai, India and employs 8,500 people.

7.3.2 Mazagon Docks Limited – main products and services

The key products offered by the company include:

Table 31: Mazagon Docks Limited – Main Products and Services

Products	Services
Naval ships	Not available
Corvettes	
Destroyers	
Godavari-class frigates	
Nilgiri	
Patrol vessels	
Missile boats	
Type 1500 (SSK) submarines	
Six-Leander-class frigates	

Source: Annual report, company website, primary and secondary research **© ICD Research**

7.3.3 Mazagon Docks Limited – recent announcements and strategic initiatives

February 2011: Announced plans to issue a US$11 billion global tender for building six more next generation submarines. The new submarine program, known as Project 75I, will be in addition to the six Scorpene-class submarines already being built at Mazagon Docks

September 2010: The company announced plans to invest INR10 billion (US$222.2 million) to set up a shipyard in Gujarat, India.

July 2010: The Indian government announced it will give 53 acres of land to the company for manufacturing Navy ships

7.3.4 Mazagon Docks Limited – alliances

Table 32: Mazagon Docks Limited – Alliances

Alliance	Partner Company	Year Formed	Strategic Objectives and Focus Area
DCN and MDL	DCN France	2008	• **Product Focus:** The transfer of technology in training Indian and engineers to build six Scorpene submarines for the Indian Navy. The submarines are being acquired under a US$3.5 billion contract. • **Market Focus:** Indian defense industry.
Co-operation	DCNS	2009	• **Strategic focus:** To provide consultancy and technical assistance services by helping to source and qualify Indian suppliers for submarine components and equipment, as part of the six submarine orders placed by the Indian Navy.

Source: Company website and ICD Research analysis

7.3.5 Mazagon Docks Limited – recent contract wins

Table 33: Mazagon Docks Limited – Recent Contract Wins

Date	Contract Value	Client	Description
September 2010	US$6.5 billion	Indian Navy	To build four stealth destroyers for the Indian Navy under Project-15B.
Jun 2009	US$9.3 billion	Ministry of Defense	MDL and Garden Reach Shipbuilders Limited signed a deal to jointly manufacture seven Project 17A frigates. P 17A will be India's first dual shipyard contract.
Apr 2009	Not available	Indian Navy	The Defense Acquisition Council (DAC) cleared the construction of four 6,800-ton destroyers by Mazagon Dock Ltd Mumbai in April 2009.There was no competitive bidding for the project, which is a upgrade of the currently underway Project 15A, which heads the construction of three Kolkata class destroyers at MDL. Project 15B warships are expected to differ from their predecessors only in the sensor and weapon suite that they carry. Any orders placed with MDL by the end of 2009 will be commissioned in mid-2015.

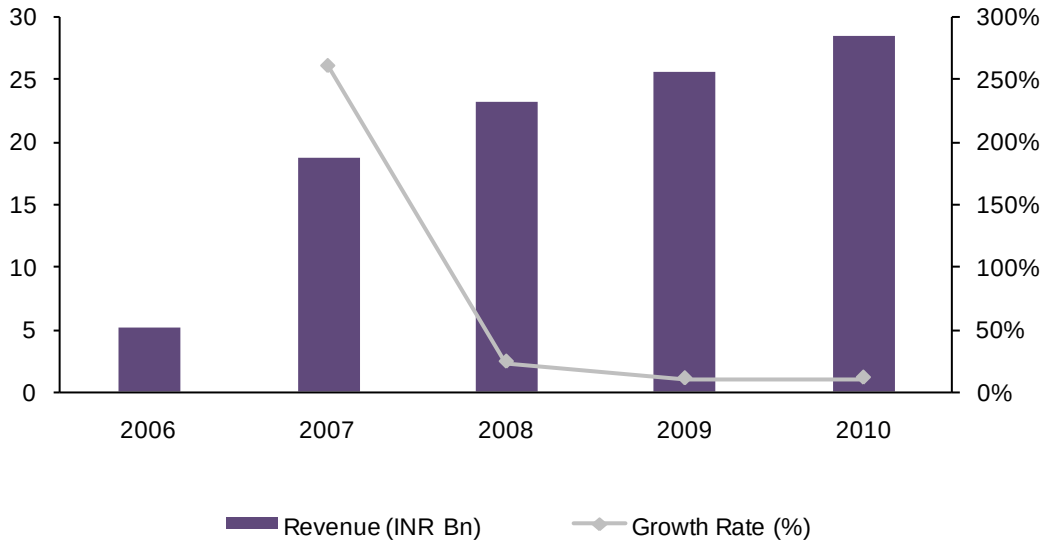
Source: Company website and ICD Research analysis

7.3.6 Mazagon Docks Limited – financial analysis

The company reported consolidated revenues of INR5.2 billion (US$115 million) in 2006, which grew at a CAGR of 53.21% during 2006–2010, to reach INR28.6 billion (US$634.7 million) by 2010.

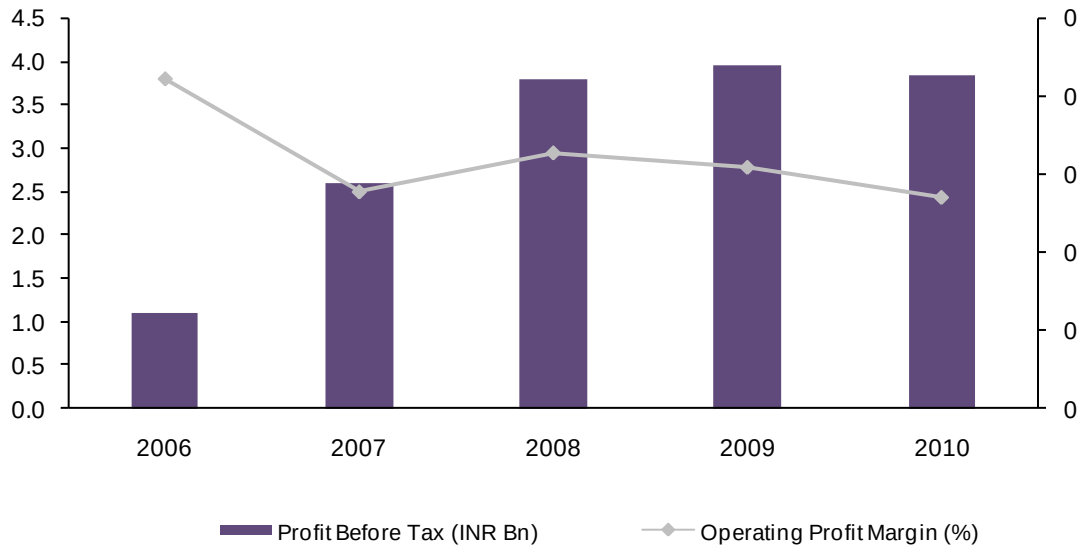
The following figures display the company's trend analysis of revenue, operating income and net profit for 2006–2010:

Figure 28: Mazagon Docks Limited – Revenue Trend Analysis (INR Billion), 2006–2010



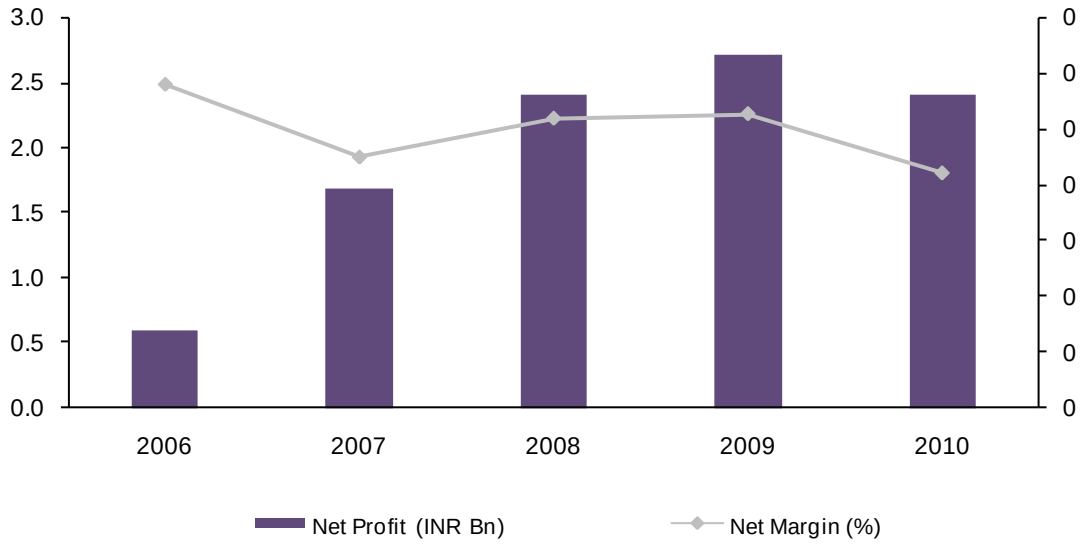
Source: Company website, annual reports and ICD Research analysis

Figure 29: Mazagon Docks Limited – Profit Before Tax (INR Billion), 2006–2010



Source: Company website, annual reports and ICD Research analysis

Figure 30: Mazagon Docks Limited – Net Profit Trend Analysis (INR Billion), 2006–2010



Source: Company website, annual reports and ICD Research analysis

7.3.7 Hindustan Aeronautics Limited – overview

Hindustan Aeronautics Limited (HAL) specializes in designing, manufacturing, servicing and supplying aircraft, aero engines, accessories and avionics for defense and civil aviation markets. The company offers advanced light helicopters, light combat aircraft, intermediate jet trainers, military and civil upgrades and structures for satellite launch vehicles. It also provides fighter, bomber and air superiority aircraft, interceptor and fighter aircraft, metallic drop tanks, undercarriages, ejection seats, canopies, rubber fuel tanks, aerospace fasteners and spare parts. In addition, the company offers industrial marine gas turbine and airport, overhaul, defect investigation/failure analysis, product training, service engineers posting, design support, aircraft maintenance and repair, modification and technical instructions compliance, accident and incident investigation, aircraft up gradation and role equipment integration alongside personnel training services. The firm provides more services, which comprise the repair and overhaul of aircraft rotables and landing gears/retraction jacks, forecasting spares requirements, spectro photo-metric oil analysis, electron beam welding, sermetal coating, chemical milling and the design and construction of engine test beds. HAL was founded in 1964 by the merger of Hindustan Aircraft Limited with Aeronautics India Limited and Aircraft Manufacturing Depot, Kanpur. It is based in Bangalore, India.

7.3.8 Hindustan Aeronautics Limited – main products and services

The key products offered by the company are:

Table 34: Hindustan Aeronautics Limited – Main Products and Services

Products	Services
Dhruv: advanced light helicopter	Upgrade of helicopters
Chetak: multi-purpose helicopter	Development of modifications
Cheetah: multi-purpose helicopter	Maintenance and overhaul of helicopters
Lancer: light attack helicopter	In-house repairs of helicopters
Communication/navigation equipment	Scheduled and unscheduled servicing of helicopters
IFF 400: identification of friend or foe	Life extension studies
IFF 1410A: automatic replies to appropriate ground or airborne interrogators	Technical support
ADF (automatic direction finder)	Training
VUC-201 A: a combined V /UHF main communication set	
INCOM-1210A: integrated radio communication system	
COM-150A: UHF standby equipment	
COM-1150A: UHF standby equipment	
COM-104A/105A: VHF communication equipment	
HFSSB: HF single sideband communication set	
Advanced communication equipment	
Jaguar avionics	
MiG-27M avionics	
Accessories for aircraft, helicopters and Aero engines	
Instruments, sensors, gyros	
Electrical power generation and control	
Land navigation system	
Microprocessor controller	

Undercarriage: wheels and brakes
Hydraulic system and power control
Environmental control system
Ground support equipment and test rigs
Source: Annual report, company website, primary and secondary research © ICD Research

7.3.9 Hindustan Aeronautics Limited – recent announcements and strategic initiatives

February 2011: The company exhibited its future products, technologies and design capabilities at Aero India 2011.

February 2011: The Bell 412 full-mission simulator of the Helicopter Academy to Train by Simulation of Flying (HATSOFF), a joint venture owned equally by Hindustan Aeronautics Limited (HAL) and CAE, was given the highest qualification for flight simulated by India's Directorate General Civil Aviation (DGCA) and the European Aviation Safety Agency (EASA), and is now certified to Level D.

May 2010: The company's light combat helicopter (LCH), a derivative of its advanced light helicopter (Dhruv), was dedicated to India.

March 2010: The first technology demonstrator of the light combat helicopter (LCH) designed and developed by the company completed its maiden flight at Helicopter Complex, Bangalore

7.3.10 Hindustan Aeronautics Limited – alliances

Table 35: Hindustan Aeronautics Limited – Alliances

Alliance	Partner Company	Year Formed	Strategic Objectives and Focus Area
Agreement	Magellan aerospace corporation	2011	• **Strategic focus:** The design and development of a Wire Strike Protection System (WSPS®) for the advanced light helicopter of HAL.
Joint venture	Rolls-Royce	2010	• **Strategic focus:** To create a manufacturing joint venture company in Bangalore, India. The new company, a 50:50 joint venture will undertake the manufacture of compressor shroud rings.
Joint venture	United Aircraft Corporation & Rosoboronexport	2010	• **Strategic Focus:** To co-develop and co-produce a multi-role transport aircraft (MTA) which would meet the requirement of the Indian Air Force and the Russian Air Force.
Agreement	CAE Inc	2009	• **Strategic focus:** To develop the HATSOFF helicopter training centre.

Source: Company website and ICD Research analysis © ICD Research

7.3.11 Hindustan Aeronautics Limited – recent contract wins

Table 36: Hindustan Aeronautics Limited – Recent Contract Wins

Date	Contract Value	Client	Description
February 2011	Not available	The Nambian Air Force	To supply two Chetak Helicopters to Namibia in 2011
March 2010	Not available	The Indian Army	To supply 20 Cheetal helicopters to replace the country's ageing fleet of Cheetah and Chetak helicopters
August 2008	US$20 million	Turkey government	For delivery of three advanced light helicopters (ALH)
June 2008	US$51 million	The Ecuadorian Air Force	To supply seven Dhruv, advanced light helicopters
June 2008	US$14.6 million	Peru government	To supply two Dhruv, advanced light helicopters
March 2008	US$895 million	The Indian Army	To supply 197 light combat helicopters for the Indian Army

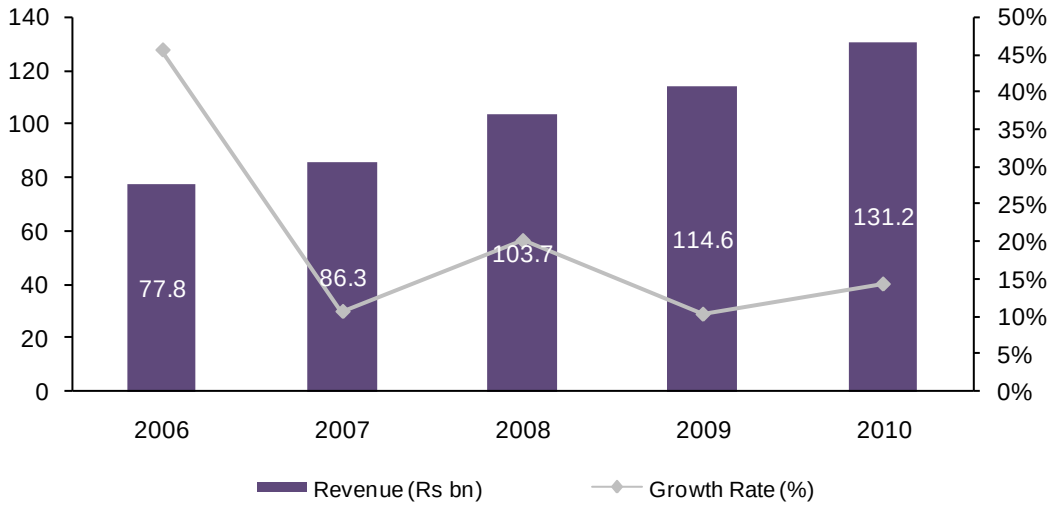
Source: Company website and ICD Research analysis

7.3.12 Hindustan Aeronautics Limited – financial analysis

During 2006–2010, the company's revenue grew at a CAGR of 13.93%, and reached INR131.15 billion (US$2.6 billion) in 2010.

The following charts display the company's revenue, operating profit and net profit analysis during 2006–2010:

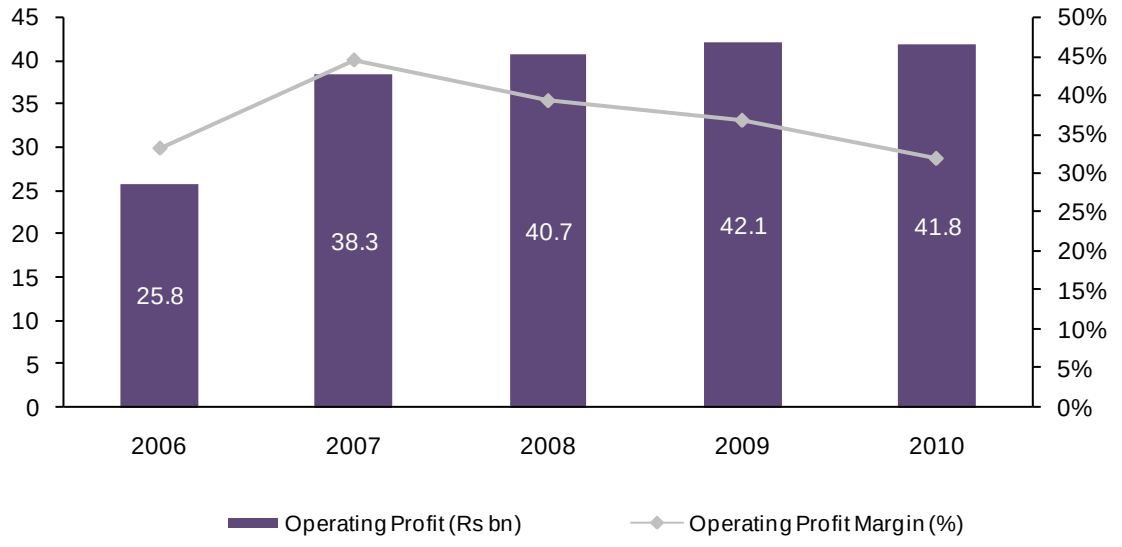
Figure 31: Hindustan Aeronautics Limited (HAL) – Revenue Trend Analysis (INR Billion), 2006–2010



Source: Company website, annual reports and ICD Research analysis

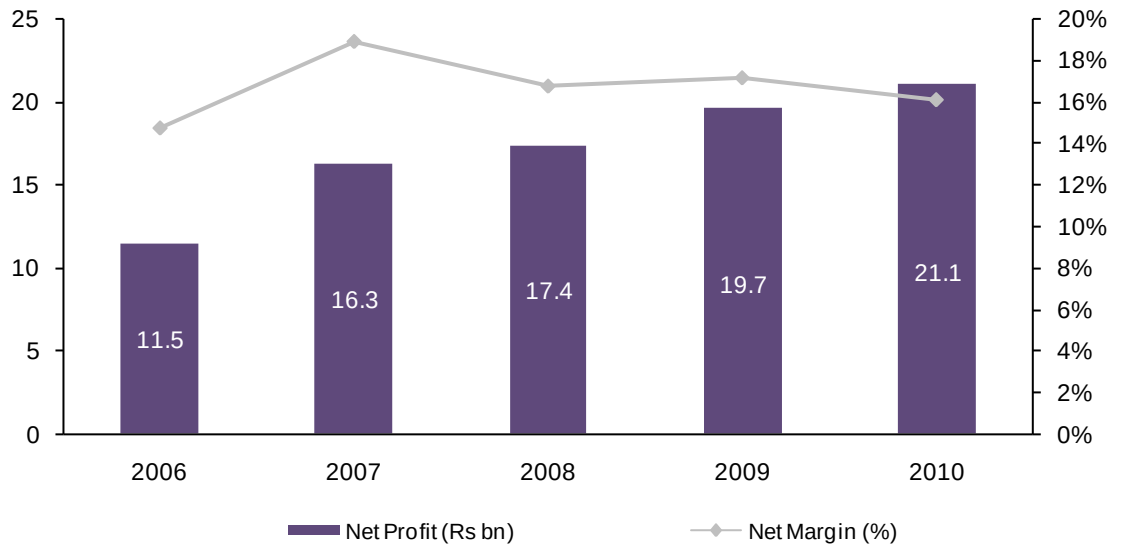
Published: November 2011

Figure 32: Hindustan Aeronautics Limited (HAL) – Operating Profit Trend Analysis (INR Billion), 2006–2010



Source: Company website, annual reports and ICD Research analysis

Figure 33: Hindustan Aeronautics Limited (HAL) – Net Profit Trend Analysis (INR Billion), 2006–2010



Source: Company website, annual reports and ICD Research analysis

Published: November 2011

7.3.13 Bharat Electronics Limited – overview

Bharat Electronics Limited (BEL) was established in 1954 by the Ministry of Defense in Bangalore, to meet the specialized needs of the defense electronics market. The company has grown into a multi-product, multi-technology and multi-unit organization, employing over 12,000 people and servicing the needs of customers in diverse fields throughout India and abroad. BEL offers products and services with a broad spectrum of technology, such as radars, military communications, naval systems, electronic warfare systems, telecommunications, sound and vision broadcasting, opto-electronics, tank electronics, solar photovoltaic systems, embedded software and electronic components.

7.3.14 Bharat Electronics Limited – main products and services

The key products offered by the company are:

Table 37: Bharat Electronics Limited – Major Products and Services

Products	Services
Communication	Contract manufacturing.
Military communication: Link II systems, communication networks, pylon integrated boxes, tactical communication systems and wireless message transfer units.	Design and manufacturing services.
Military switching: Unit level switch board, MK II, semi-ruggedized automatic exchange, SRAX MKII, digital exchanges (DEX) and time division modular exchanges.	Semiconductor device packaging.
Radar	Software development.
3D mobile radars.	Quality assurance facilities
Low flying detection radars.	
Tactical control radars.	
Secondary surveillance radars.	
Low-level air defense systems.	
Medium-range battle field surveillance radars.	
Battle-range surveillance radars.	
Short-range radars.	
3D surveillance radar for air defense (Rohini).	
3D tactical control radars.	
Surveillance radar elements.	
Low-level lightweight surveillance radars.	
Weapon locating radars.	
Naval systems	
These systems help in communicating between ships, ship and aircraft and ship and shore stations. BEL has a dedicated strategic business unit to cater to the needs of naval defense forces. It is involved in the design and manufacturing of a wide variety of control, command and communications systems, as well as sonar, decoys and sonobuoys.	
Sonar: Hull-mounted variable-depth sonar, advanced hull-mounted sonar, and towed torpedo decoys.	
Fire control systems: Naval fire control radars, optical director systems and TV cameras.	

Communication systems: ATM-based integrated shipboard data networks, composite communication systems (CCS) MK II, CCS MK III and versatile console systems (VCS) MK II.
Opto-electronics
Laser range finders (LH-30).
Eye-safe laser range finders (LRF310).
Gap measuring devices (GAP MKI).
Integrated laser night vision (GMD MK II).
Hand held thermal imagers
Forward observer video communication systems.
Uncoiled thermal imagers (BEAUTI-0602).
Battery products and x-ray products.
Electronic warfare systems
Tank electronics
Tank intercom systems (R-174).
Combat net radios (AFV).
Indigenous gunner main sight for MBTs.
Advanced land navigation systems for AFVs.
Tank stabilizers
Digital universal control harnesses for AFVs.
Simulators
Driving simulators (SIMU DRIVE), crew gunnery simulator, ship handling simulator, anti-tank guided missile (ATGM), indoor simulator and tank driving simulator.
Source: Annual report, company website, primary and secondary research **© ICD Research**

7.3.15 Bharat Electronics Limited – recent announcements and strategic initiatives

June 2009: Northrop Grumman chose Bharat Electronics Limited to manufacture components for the F-16 APG-68(V) 9 fire control radar

7.3.16 Bharat Electronics Limited – alliances

Table 38: Bharat Electronics Limited – Alliances

Alliance	Partner Company	Year Formed	Strategic Objectives and Focus Area
Boeing and Bharat Electronics Limited	Boeing	2009	• **Product Focus:** To develop an analysis and experimentation centre in India, which enables customers to make more informed decisions about modernizing India's defense forces. • **Market Focus:** India.
BEL and SELEX Galileo	SELEX Galileo	2009	• **Product Focus:** To explore potential opportunities in the field of electronic warfare in the Indian market for offset requirements and contract manufacturing in the Indian market.
MoU with Indian Institute of Sciences (IISc)	Institute of Sciences (IISc)	2009	• **Product Focus**: BEL aims to acquire academic, scientific and technological inputs, along with the technical manpower needed to drive futuristic radar projects.

Table 38: Bharat Electronics Limited – Alliances

			• **Market Focus**: The domestic and global market.
BEL and Thales	Thales	2009	• **Product Focus:** The manufacture of radars. • **Market Focus:** India.
DRDl, BEL, BDL, IAI, Rafael Advanced Defense Systems Ltd	Defense Research Development Laboratory (DRDL), Bharat Dynamics Ltd, Israel Aerospace Industries, Rafael Advanced Defense Systems Ltd	2009	• **Product Focus**: The joint development of the 70 km-range variant of the Mach 4 Barak-2 vertically-launched medium-range surface-to-air missile (MR-SAM), and its 120 km-range long-range variant (LR-SAM). • **Market Focus:** India.
Rafael and Bharat Electronics Ltd	Rafael Advanced Defense Systems Ltd	2008	• **Product Focus:** To encourage indigenous advanced technology capabilities of missile electronics and guidance technologies within India. To enable Rafael to transfer valuable technologies to India. • **Market Focus:** India.
BEL and Elisra Israel	Elisra	2008	• **Product Focus:** Joint venture for the development of various airborne electronic warfare programs for Indian defense requirements. • **Market focus:** India.
BEL and Israel Aerospace Industries Ltd	Israel Aerospace Industries Ltd	2008	• **Product Focus:** The development of an unmanned aerial vehicle system for Indian defense requirements. • **Market focus**: India.
BEL and Elbit Systems' Electro Optics ELOP	Elbit Systems	2007	• **Product Focus:** To develop, produce and sell thermal imagers and forward-looking infrared gear**.** • **Market Focus:** India and international markets.
Agreement between BEL and L&T	L&T	2004	• **Product Focus**: The co- development of radars • **Market Focus**: India.
Agreement between BEL and Sextant Avionics	Sextant Avionics, France	1998	• **Product Focus:** The transfer of technology for liquid crystal display systems (LCD) for MIG 21 aircrafts. • **Market Focus:** India.
BEL and Tadiran, Israel	Tadiran, Israel	Not available	• **Product Focus:** HF manpack radios, vehicle mounted HF radio sets. • **Market Focus:** India.
BEL and Rhode and Shwarz, Germany	Rhode and Schwarz, Germany	Not available	• **Product Focus:** The development of VLF/HF receivers. • **Market Focus:** India.
BEL and Ericsson MW Sys, Sweden	Ericsson MW Sys, Sweden	Not available	• **Product Focus:** SFM trainers. • **Market Focus:** India.
BEL and Alenia Marconi System Spa, Italy	Alenia Marconi System, Italy	Not available	• **Product Focus:** Surveillance radar elements**.** • **Market Focus:** India.
BEL and INROS Ltd, Russia	INROS Ltd, Russia	Not available	• **Product Focus:** Sonobuoys. • **Market Focus:** India.
BEL and Kelvin Hughes Ltd, USA	Kelvin Hughes, US	Not available	• **Product Focus:** Color Tactical Displays. • **Market Focus:** India.

Source: Company website and ICD Research analysis **© ICD Research**

7.3.17 Bharat Electronics Limited – recent contract wins

Table 39: Bharat Electronics Limited – Recent Contract Wins

Date	Contract Value	Client	Description
Jan 2011	INR3.5 billion (US$70 million)	Indian Coast Guard	To provide a network of radars on light houses to fill gaps in the country's coastal surveillance capabilities
Jan 2009	INR12 billion (US$ 300 million)	Indian Air Force	The Indian Air Force placed an order with Bharat Electronics Limited (BEL) for two squadrons of medium-range, surface-to-air Akash missiles.

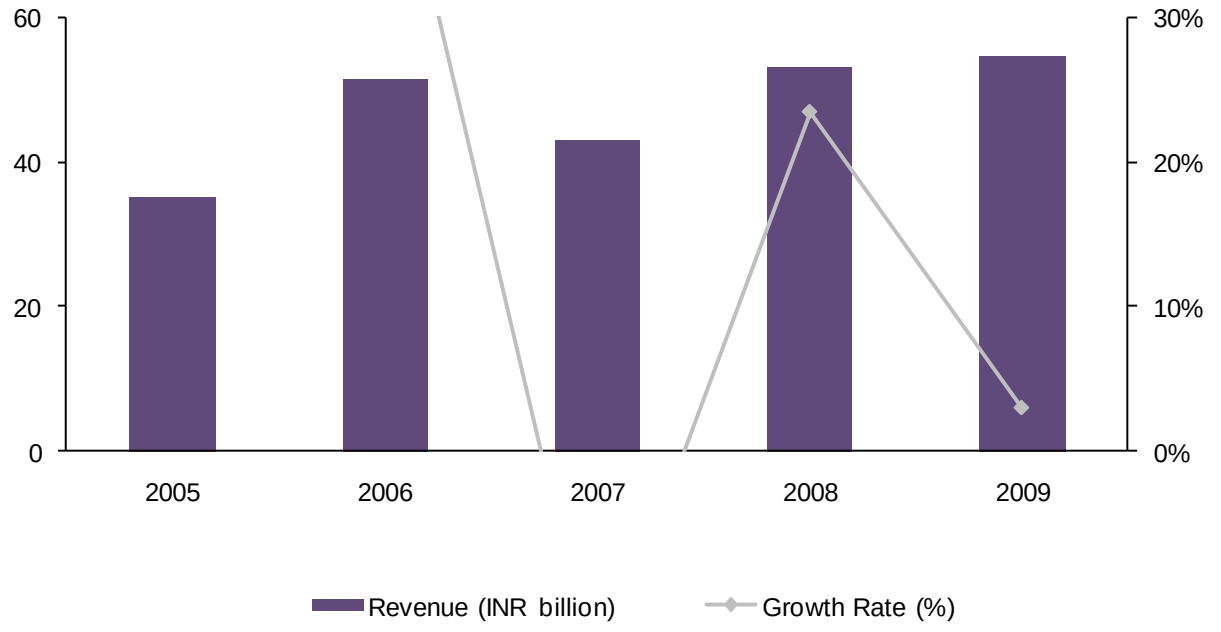
Source: Company website and ICD Research analysis

7.3.18 Bharat Electronics Limited – financial analysis

During 2006–2010, the company's revenue grew at a CAGR of 11.64%, and reached INR54.7 billion (US$1.1 billion) in 2010.

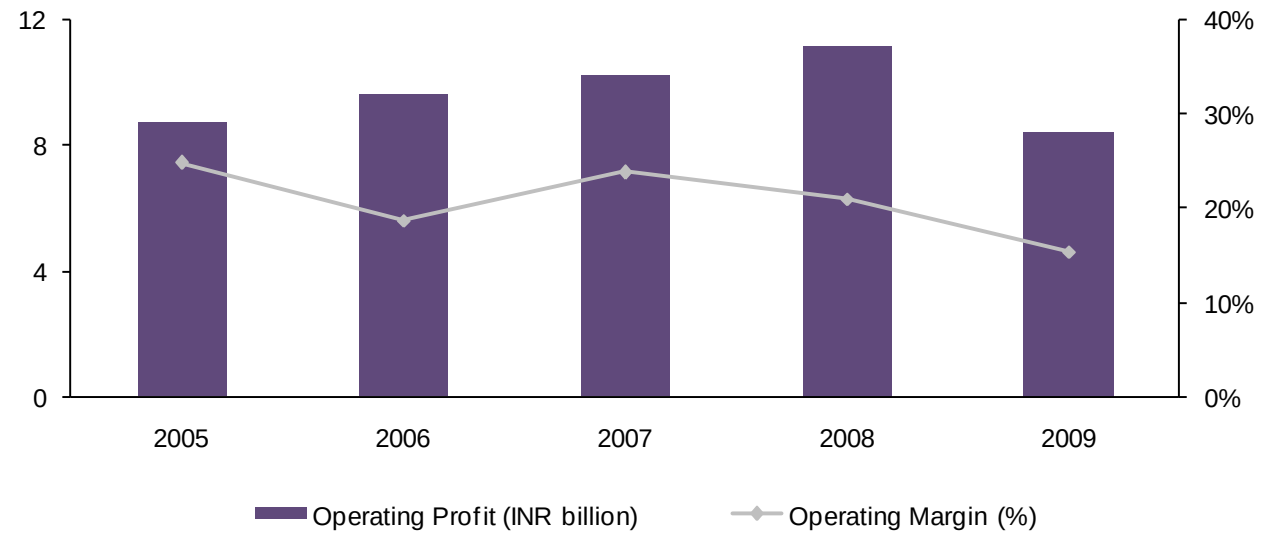
The following charts display the company's revenue, operating profit and net profit analysis during 2005–2009:

Figure 34: Bharat Electronics Limited – Revenue Trend Analysis (INR Billion), 2005–2009



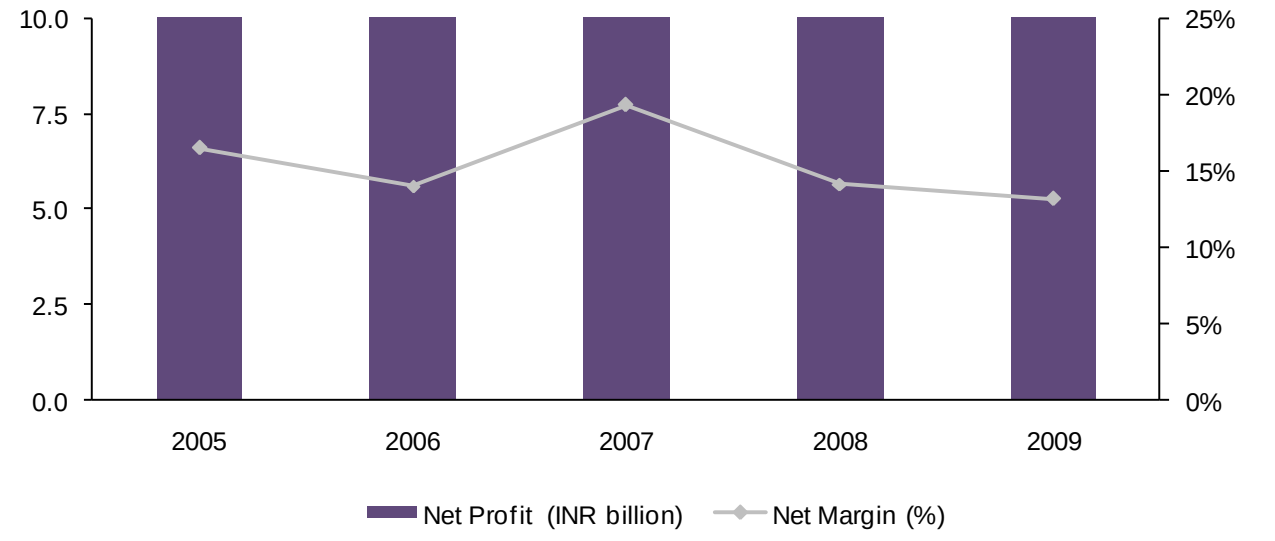
Source: Company website, annual reports and ICD Research analysis

Figure 35 Bharat Electronics Limited – Operating Profit Trend Analysis (INR Billion), 2005–2009



Source: Company website, annual reports and ICD Research analysis

Figure 36: Bharat Electronics Limited – Net Profit Trend Analysis (INR Billion), 2005–2009



Source: Company website, annual reports and ICD Research analysis

7.3.19 Bharat Dynamics Limited – overview

Bharat Dynamics Limited (BDL) was formed by the Ministry of Defense in 1970 for the production of guided missiles and allied defense equipment. BDL is the prime production agency for missile weaponry systems under the Integrated Guided Missile Program, including for Prithvi, Trishul, Akash and Nag missiles. The company also produces the second generation anti-tank guided missile, Milan, under license from Euro Missile, France, and the Konkurs missile, with Russian expertise.

The company has expanded into small arms production, catering to India's paramilitary forces. This includes the manufacture of 7.62 mm self-loading rifles and 9 mm pistols.

7.3.20 Bharat Dynamics Limited – main products and services

The key products offered by the company are:

Table 40: Bharat Dynamics Limited – Main Products and Services

Products	Services
Missiles	Not available
Prithvi missile: medium-to-long range missile systems.	
Konkurs-M: semiautomatic, aero missile.	
Invar: antitank weapon with a range of five kilometers.	
Counter measure systems	
C303: a decoy system for the torpedo counter measure system for submarines.	
Counter measures dispensing system (CMDS): an airborne defensive system providing aircraft with self-protection by passive ECM against radar-guided and IR-seeking air and ground launched missiles.	
Infrared interference indicator (IRII): detects infrared interference in the field of view of launcher prior to firing of the missile.	
Advanced light weight torpedoes	

Source: Annual report, company website, primary and secondary research

7.3.21 Bharat Dynamics Limited – recent announcements and strategic initiatives

July 2011: The public sector defense production unit, Bharat Dynamics Limited (BDL), will set up two complexes for manufacturing missile systems in Andhra Pradesh.

March 2011: BDL is gearing up to manufacture a series of missiles that have been or are being developed by the DRDO

7.3.22 Bharat Dynamics Limited – alliances

Table 41: Bharat Dynamics Limited – Alliances

Alliance	Partner Company	Year Formed	Strategic Objectives and Focus Area
Memorandum of Understanding (MoU)	MBDA	2011	• **Strategic Focus:** To transfer technology to India's state-owned Bharat Dynamics Ltd (BDL), to build advanced Milan 2T anti-tank guided missiles under license at Indian facilities.
Memorandum of Understanding (MoU)	Electronics Corporation of India Limited (ECIL)	2011	• **Strategic Focus:** To synergize the core competencies of both the PSUs, and work together as preferred associates to address major defense programs.
Memorandum of Understanding (MoU)	MBDA	2005	• **Strategic Focus:** To produce Milan ERs at Indian facilities for domestic and foreign purchase
Technology Transfer Agreement	Euromissile	1981	• **Strategic Focus:** To produce second generation ATGM Milan .
Technology Transfer Agreement	Russia	1989	• **Strategic Focus:** To produce ATGM Konkur.

Source: Company website and ICD Research analysis

7.3.23 Bharat Dynamics Limited – recent contract wins

Table 42: Bharat Dynamics Limited – Recent Contract Wins

Date	Contract Value	Client	Description
January 2011	US$56 million	Indian Army	Ordered more than 4,000 Milan 2T missiles, which will be inducted within three years
March 2011	US$3.1 billion	Indian Army	For the production of Akash, the surface-to-air (SAM) missile.

Source: Company website and ICD Research analysis

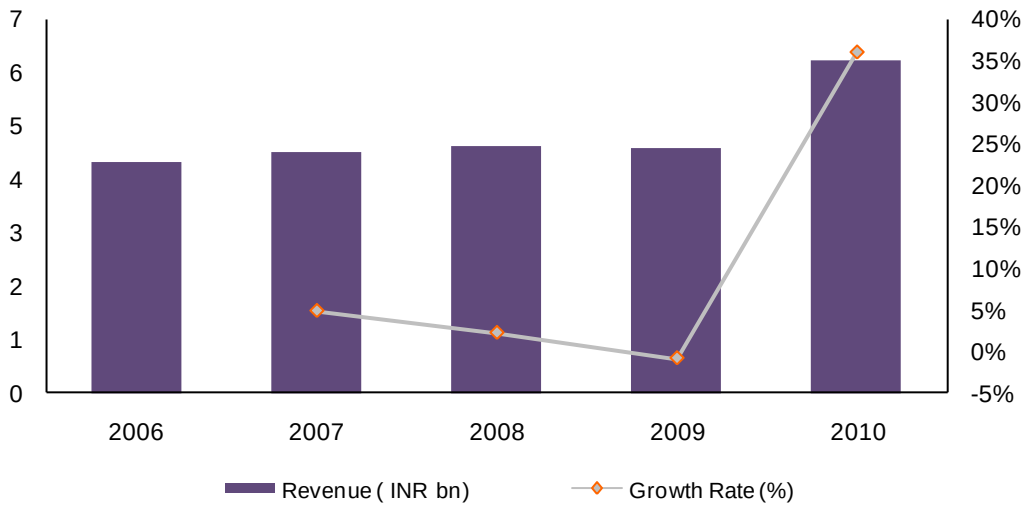
Published: November 2011

7.3.24 Bharat Dynamics Limited – financial analysis

The company reported revenue of INR7.81 billion during 2010, recording a CAGR of 15.85% during 2006–2010.

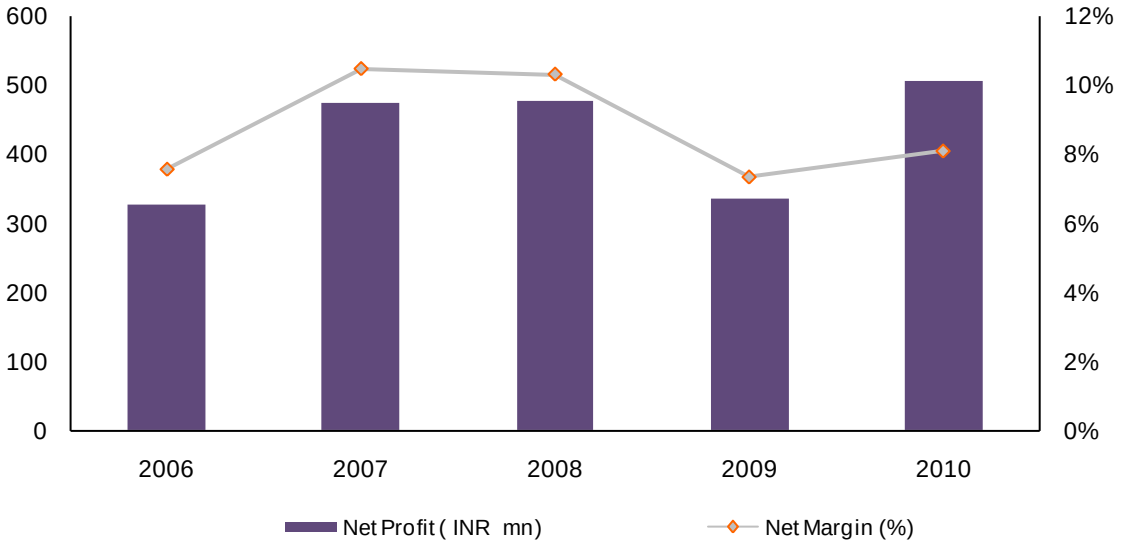
The following charts display the company's revenue and net profit analysis during 2006–2010:

Figure 37: Bharat Dynamics Limited – Revenue Trend Analysis (INR Billion), 2006–2010



Source: Company website, annual reports and ICD Research analysis

Figure 38: Bharat Dynamics Limited – Net Profit Trend Analysis (INR Billion), 2006–2010



Source: Company website, annual reports and ICD Research analysis

7.3.25 Ordinance Factory Board – overview

Ordnance Factory is one of the oldest and largest Indian industrial establishments, and functions under the Ministry of Defense. Headquartered in Kolkata, it is a conglomerate of 39 factories, nine training institutes, three regional marketing centers and four regional controllers of safety. The company is involved in the production, testing, logistics, research, development and marketing of weapons, ammunitions, armored and transport vehicles, troop comfort equipments, and opto-electronics.

7.3.26 Ordinance Factory Board – main products and services

The key products offered by the company are:

Table 43: Ordinance Factory Board – Main Products and Services

Products	Services
Pistols and revolvers	Not available
Civilian arms and ammunition	
Weapons	
Ammunitions, explosives, propellants and chemicals	
Military vehicles	
Armored vehicles	
Optical devices	
Parachutes	
Support equipment	
Troop comfort and general stores	
Material, components and SPMs	

Source: Annual report, company website, primary and secondary research © ICD Research

7.3.27 Ordinance Factory Board – recent announcements and strategic initiatives

May 2011: The company announced that Kawach rockets are expected to be inducted by Indian Navy in 2013.

March 2011: The company has drawn up an extensive modernization and infrastructure plan in all of its 39 factories across India

December 2010: The company has delivered first set of 20 indigenously developed practice anti-submarine rockets

November 2010: The company has offered the Indian government an upgrade of the Indian Army's 155 mm Bofors Artillery Guns.

7.3.28 Ordinance Factory Board – alliances

Table 44: Ordinance Factory Board – Alliances

Alliance	Partner Company	Year Formed	Strategic Objectives and Focus Area
BAE Systems and Ordnance Factory Board	BAE Systems PLC	Not available	• **Product Focus:** To upgrade the air defense guns of the Indian Army. • **Market Focus:** India.
IMI and Ordnance Factory Board	Israel Military Industries Ltd (IMI)	Not available	• **Product Focus:** To build five artillery munitions factories over three years • **Market Focus:** India and international markets.

Source: Company website and ICD Research analysis

7.3.29 Ordinance Factory Board – recent contract wins

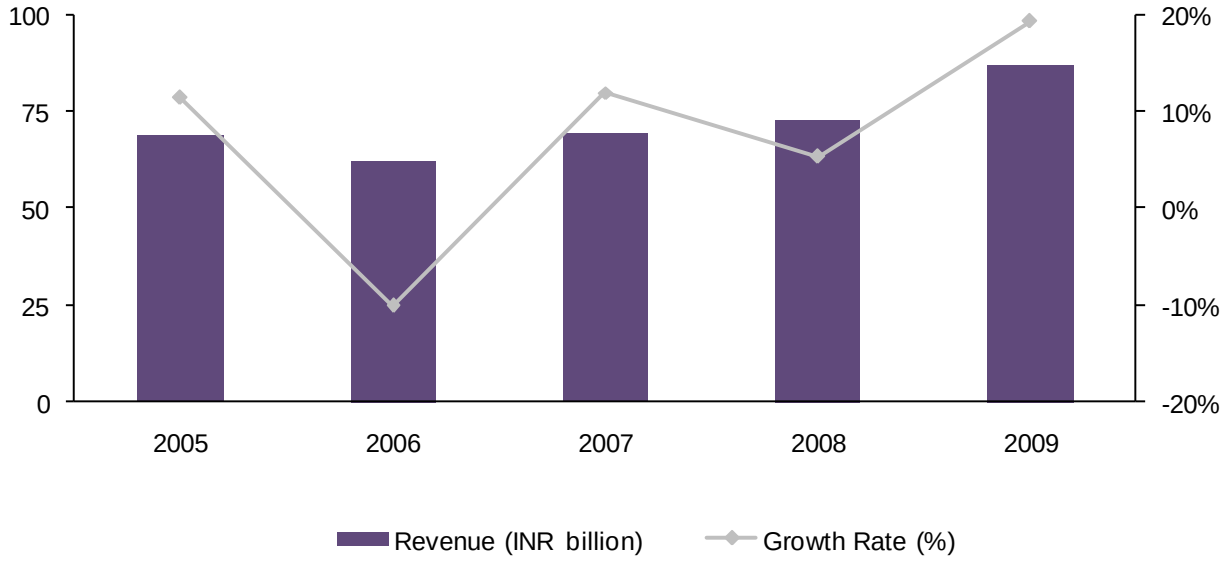
Not available.

7.3.30 Ordinance Factory Board – financial analysis

The company reported revenue of INR87.2 billion during 2010, recording a CAGR of 6.06% during 2005–2009.

The following charts display the company's revenue analysis during 2005–2009:

Figure 39: Ordinance Factory Board – Revenue Trend Analysis (INR Billion), 2005–2009



Source: Company website, annual reports and ICD Research analysis

7.3.31 BEML – overview

Bharat Earth Movers Limited (BEML) offers products for diverse industries, such as the coal, mining, steel, limestone, power, irrigation, construction, road building, aviation, defense, metro and rail industries. BEML has three operating divisions: mining and construction, defense, and rail and metro. For the defense industry, the company supplies ground support vehicles for the integrated guided missile development project. The company is also engaged in testing defense equipment and vehicles.

7.3.32 BEML – main products and services

The key products offered by the company are:

Table 45: BEML – Main Products and Services

Products	Services
Models of BEML	Not available
TATRA vehicles with non-euro version.	
TATRA T815 VVNC 8x8 vehicles.	
TATRA T815 VVL 8x8 vehicles.	
TATRA T815 VTI 8x8 tank transporters.	
30 M telescopic mobile mast on TATRA T815 VVNC 8X8 chassis.	
TATRA T815 VVNC 8X8 chassis for 15 M bridge laying role.	
TATRA T815 VVNC 6x6 high mobility vehicles.	
TATRA T815 VVNC 6x6 field artillery tractors.	
TATRA T815 VI 4x4 high mobility vehicles.	
TATRA crash fire tenders.	
Prithvi missile launchers.	
Carrier vehicles.	
Missile transporters.	
10T mobile cranes.	
Ammunition loaders.	
Backhoe loader transporters.	
Pontoon bridge sets.	
Pontoon trucks.	
Midstream pontoons and Shore pontoons.	
Truck mounted cranes.	
Motor tug launches (boats).	
Truck 4x2 for mounting rapiscan scanner units.	
HRV AV 15 – recovery vehicles (heavy, medium, light).	
TATRA vehicles with Bharat Stage – II (EURO – II) version.	
TATRA T816 6MWR 8T 10x10 vehicles.	
TATRA T815 27ET96 28 300 8x8.1R / 50T tank transporters.	
TATRA T815 27ER96 28 300 8x8.1R / 50T vehicles.	
TATRA T815 27ER96 30 300 8x8.1R / 50T – 4150 vehicles.	
TATRA T815 26RR36 22 255 6x6.1R / 50T high mobility vehicles (RHD).	

Published: November 2011

TATRA T815 25RR45 17 230 4x4.1 high mobility vehicles.
PINAKA project (multi-barrel rocket launchers).
Engineering mineploughs.
Mine protected vehicles.
Other defense products
BS42 snow cutters.
Armored recovery vehicles (WZT - 3).
Aircraft towing tractors.
Self-propelled 155 mm GUN - BHIM T6.
Trailers for tank transportation (50 ton, 65 ton, 20 ton).
Wagons (BFAT, BOMN, BRSTN, BWTB) and MILRAIL coaches
Source: Annual report, company website, primary and secondary research **© ICD Research**

7.3.33 BEML – recent announcements and strategic initiatives

April 2009: BEML established its assembly unit "BEML Brasil Industrial Ltda" in Rio De Janeiro, Brazil. The company will assemble products related to mining and construction, rail and metro, and defense divisions at this unit, and supply to its prospective customers in and around Brazil.

January 2009: BEML established a manufacturing complex in Kerala, India, which will manufacture defense equipment, including mil wagons, floating bridges, and parts and aggregates for rail and metro cars

7.3.34 BEML – alliances

Table 46: BEML – Alliances

Alliance	Partner Company	Year Formed	Strategic Objectives and Focus Area
Technical tie-up	Vosta LMG	2011	• **Strategic Focus:** To design, construct and deliver various types of Dredgers and other vessels to customers located in India and South East Asia
Memorandum of Understanding	ALENIA AERONAUTICA	2011	• **Strategic Focus:** Designing, manufacturing and selling a new basic training aircraft on a New Generation Screener
BEML and IBM enters into a MoU	IBM India Private Limited	2009	• **Product Focus:** To address the current and future business requirements emerging from the aerospace and defense (A&D) industry, by jointly offering products and services towards offset business, as well as new A&D related projects owned by Defense labs and other Original Equipment Manufacturers (OEMs). • **Market Focus:** To caters for Indian and global customers.
MoU with CSM Software	CSM Software	2009	• **Product Focus:** To establish a framework for the execution of the engineering service orders expected to be received by BEML, through CSM's sales and marketing efforts, under the defense offset clause. To ensure total customer satisfaction. • **Market Focus:** To cater for Indian and global customers.

Table 46: BEML – Alliances

MoU with Ms TATRA Sipox of UK.	Tatra Sipox, UK	2008	• **Product Focus:** Transfer of technology for BS II Engines for 4x4, 6×6 and 8x8 BEML Tatra defense trucks. • **Market Focus:** India, with global outsourcing for overseas markets.
MoU with Pearson Engineering Limited, UK	Pearson Engineering Ltd, UK	2008	• **Product Focus:** To develop engineering mine ploughs and surface clearing devices. • **Market Focus:** India.
MoU with M/s Bumar Poland	Bumar Ltd, Poland	2008	• **Product Focus:** The manufacture of armored recovery vehicles (ARVs), mine laying vehicles, as well as scattered mine-laying equipment (Kroton). • **Market Focus:** India.
MoU with DMD group as of Slovak Republic	DMD GROUP AS, Slovak Republic	2008	• **Product Focuses:** The manufacture of self-propelling wheeled 155 mm, 52 caliber guns, with the technical assistance of DMD group. • **Market Focus:** India.
MoU with WFEL of Britain	WFEL, UK	2008	• **Product Focus:** To jointly develop a "dry support bridge" on BEML Tatra vehicles. • **Market Focus:** India.
MoU with TDA Armaments SAS, France	TDA Armaments SAS, France	2008	• **Product Focus:** The integration of self-propelled mine buriers on Tatra platforms. • **Market Focus:** India.
MoU with General Dynamics Land Systems, Canada	General Dynamics Land Systems, Canada	2008	• **Product Focus:** The promotion of armored patrol vehicles, wheeled light armored vehicles and tactical vehicles. • **Market Focus:** To cater for the Indian and global markets.
MoU with Eurocopter, France	EUROCOPTER, France	2008	• **Product Focus:** To develop Aerospace business. • **Market Focus:** India.

Source: Company website and ICD Research analysis

7.3.35 BEML – recent contract wins

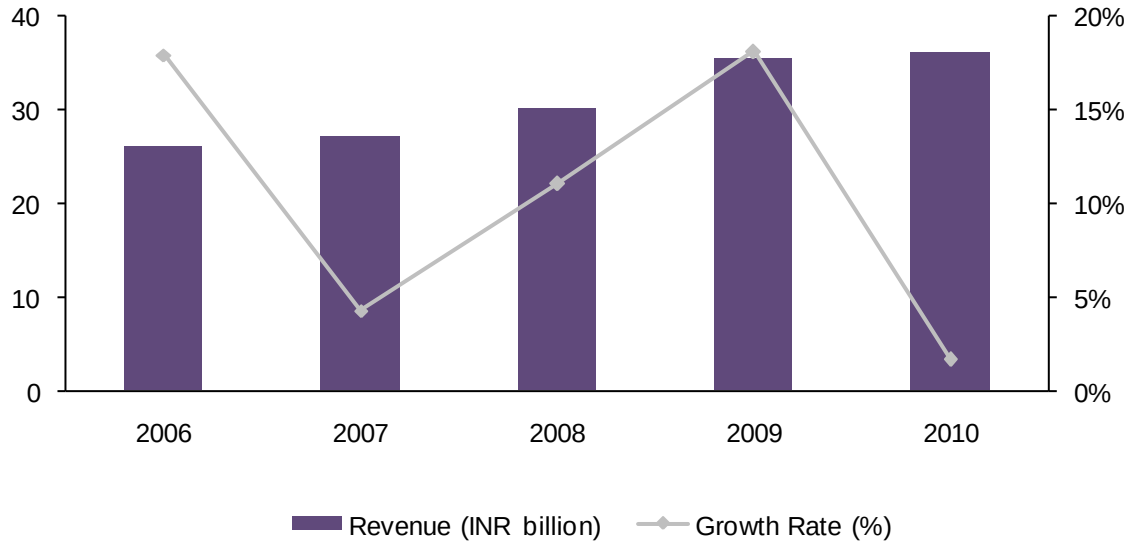
Not available.

7.3.36 BEML – financial analysis

The company's revenue grew at a CAGR of 8.61% during 2006–2010, and reached INR36.2 billion (US$0.7 billion) in 2010.

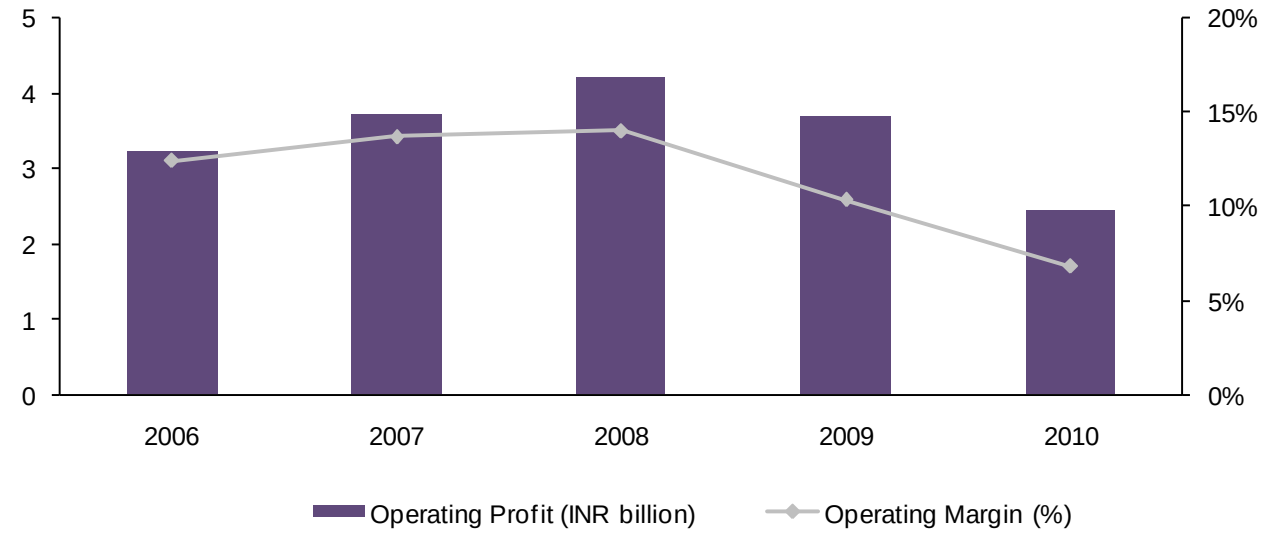
The following charts display the company's revenue, operating profit and net profit analysis during 2006–2010:

Figure 40: BEML – Revenue Trend Analysis (INR Billion), 2006–2010



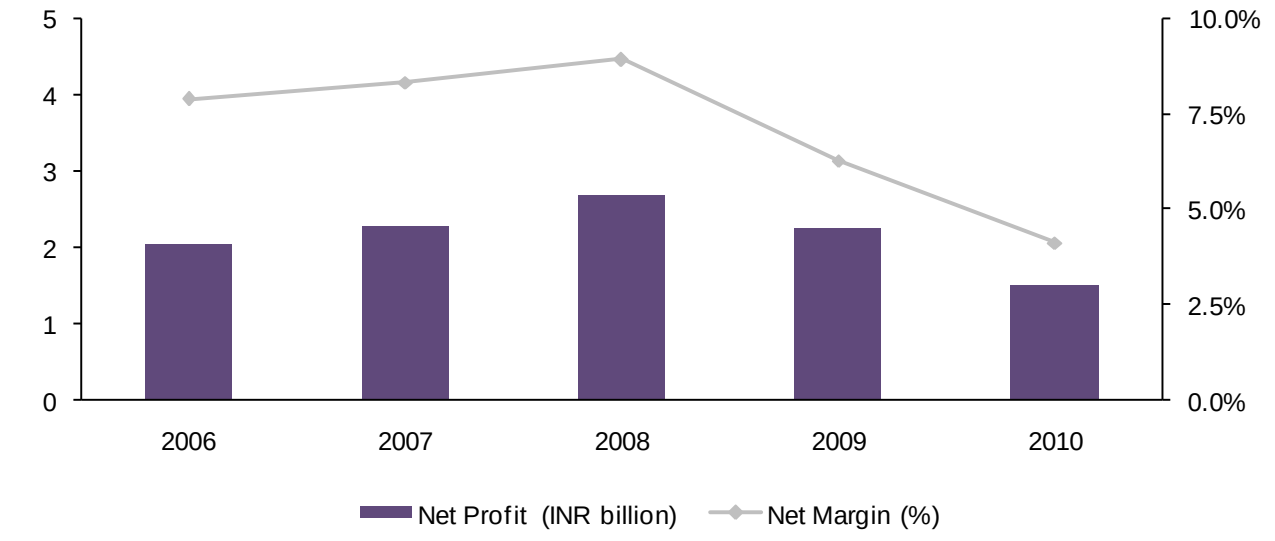
Source: Company website, annual reports and ICD Research analysis

Figure 41 BEML – Operating Profit Trend Analysis (INR Billion), 2006–2010



Source: Company website, annual reports and ICD Research analysis

Figure 42: BEML – Net Profit Trend Analysis (INR Billion), 2006–2010



Source: Company website, annual reports and ICD Research analysis

7.3.37 Goa Shipyard Limited – overview

Goa Shipyard Limited (GSL) is an ISO 9001-2000 certified shipyard on the west coast of India, functioning under the administrative control of the Ministry of Defense. GSL has designed, built and commissioned a range of sophisticated vessels for varied applications in the defense and commercial industries, with expertise in building modern patrol vessels.

7.3.38 Goa Shipyard Limited – main products and services

The key products offered by the company are:

Table 47: Goa Shipyard Limited – Main Products and Services

Products	Services
Vessels	Ship repair.
Advanced offshore petrol vessel (AOPV): designed for 24 hour, all-weather coastal patrolling, policing, anti-smuggling, anti-terrorist operations and sea-air search and rescue missions.	Ship refit.
Offshore platform supply cum standby vessels.	Ship modernization.
Fast patrol vessels: intended for naval and patrol duties in unrestricted waters and for operations under tropical conditions.	Ship conversion
Extra fast petrol vessels: sea-going, armed surveillance platforms.	
Offshore patrol vessels: intended for naval and patrol duties in unrestricted waters and for operations under tropical conditions. The vessel can be fitted with basic armament for service as a patrol gun boat.	
Hydrographic survey vessels: provides full-scale coastal and oceanic hydrographic surveys.	
300-passenger vessels: twin-screw diesel-driven passenger vessels, with seating accommodation for 288 passengers and cabin accommodation for 12 passengers.	
650-ton oil tankers: used for the transportation of high speed diesel, aviation fuel and fresh water.	
Crafts	
Extra fast attack crafts (XFAC): designed for day and night coastal surveillance and reconnaissance, and to co-ordinate sea-air search and rescue operations.	
Missile craft: a warship, designed for the destruction of enemy warships and landing crafts on the open sea.	
Landing crafts.	

Source: Annual report, company website, primary and secondary research

Published: November 2011

7.3.39 Goa Shipyard Limited – recent announcements and strategic initiatives

January 2011: The company announced that the Indian navy has launched its second sail training ship, INS Sudarshini at the company premises.

December 2010: The company has announced that Indian Navy has commissioned its new naval offshore patrol vessel (NOPV), INS Sumitra at the company premises

October 2008: Goa Shipyard Limited installed and commissioned an industrial solar water heater system, demonstrating a move towards energy independence. The project follows the environmental policies of the Indian government, and is aimed to encourage energy savings, create hygienic conditions and simultaneously minimize carbon emissions

7.3.40 Goa Shipyard Limited – alliances

Table 48: Goa Shipyard Limited – Alliances

Alliance	Partner Company	Year Formed	Strategic Objectives and Focus Area
Agreement	Kangnam Corporation	2011	• **Strategic Focus:** To build and deliver seven out of eight minesweepers for Indian navy

Source: Company website and ICD Research analysis

7.3.41 Goa Shipyard Limited – recent contract wins

Table 49: Goa Shipyard Limited – Recent Contract Wins

Date	Contract Value	Client	Description
August 2010	US$170 million	Indian Navy	To enhance the capabilities of the Indian Navy by building a new mine countermeasure vessel (MCMV), this is a type of naval ship designed for the location of, and destruction of, naval mines.
November 2009	Not available	Indian Navy	INS Sunayna, the largest patrol vessel designed in-house and built by Goa Shipyard Limited (GSL) for the Indian Navy, was launched on 14 Nov 2009 at the Goa Shipyard.
November 2009	Not available	Indian Coast Guard	An offshore patrol vessel, designed in-house and built by GSL, was launched for the Indian Coast Guard on 4 Nov 2009.
August 2009	Not available	Royal Navy of Oman	An export order of three Bollard Pull Tug Sanad-1 vessels, which are designed to accommodate two officers and eight crew members, and has an endurance of 250 Nautical miles at a cruising speed of seven knots, was launched on 19 Aug 2009. Goa Shipyard Ltd won this export order under intense global competition, and is the first Indian shipyard to get a vessel construction order from the Ministry of Defense, Sultanate of Oman. With this order, Goa Shipyard Ltd has entered into the export market of defense vessels.
April 2009	Not available	Goa coastal security police	Goa Shipyard Limited delivered its first batch of interceptor boats from the 5T and 12T categories, developed to strengthen the Coastal Security Police of States. The second batch was delivered on 26th May 2009. The vessel is primarily aimed at meeting the increasing requirements of the Indian Navy for surveillance and accomplishing surface warfare operations in order to prevent infiltration and transgression

Table 49: Goa Shipyard Limited – Recent Contract Wins			
			of maritime sovereignty.
March 2009	Not available	Indian Navy	The first of the new 105-meter class naval offshore patrol vessel, “Saryu”, indigenously designed in-house and built by Goa Shipyard Limited, was launched for the Indian Navy.

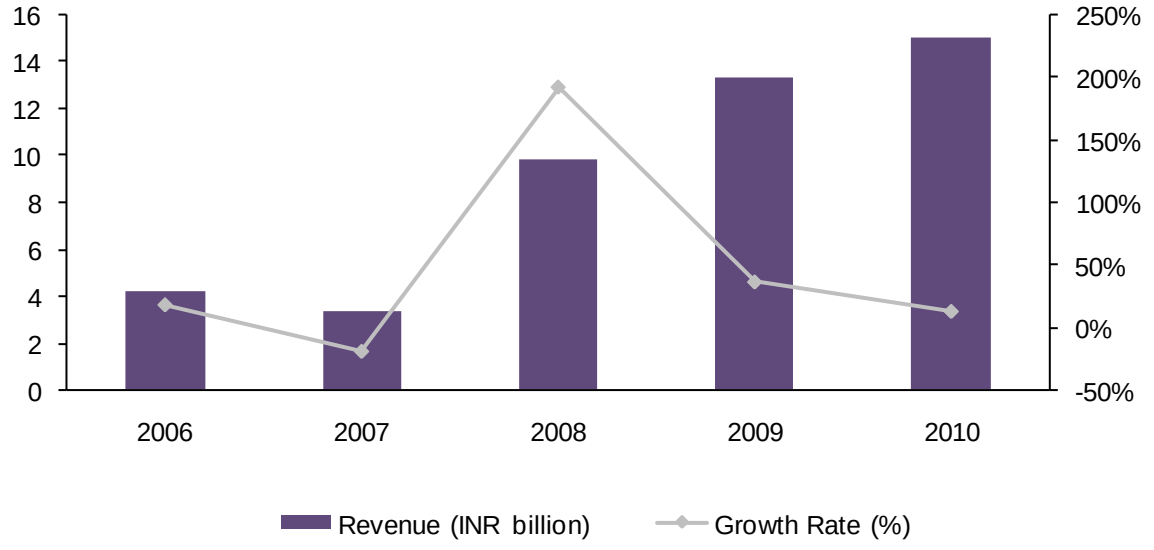
Source: Company website and ICD Research analysis © ICD Research

7.3.42 Goa Shipyard Limited – financial analysis

The company’s revenue and production grew at a CAGR of 37.64% during 2006–2010, and reached INR15.0 billion (US$0.3 billion) in 2010.

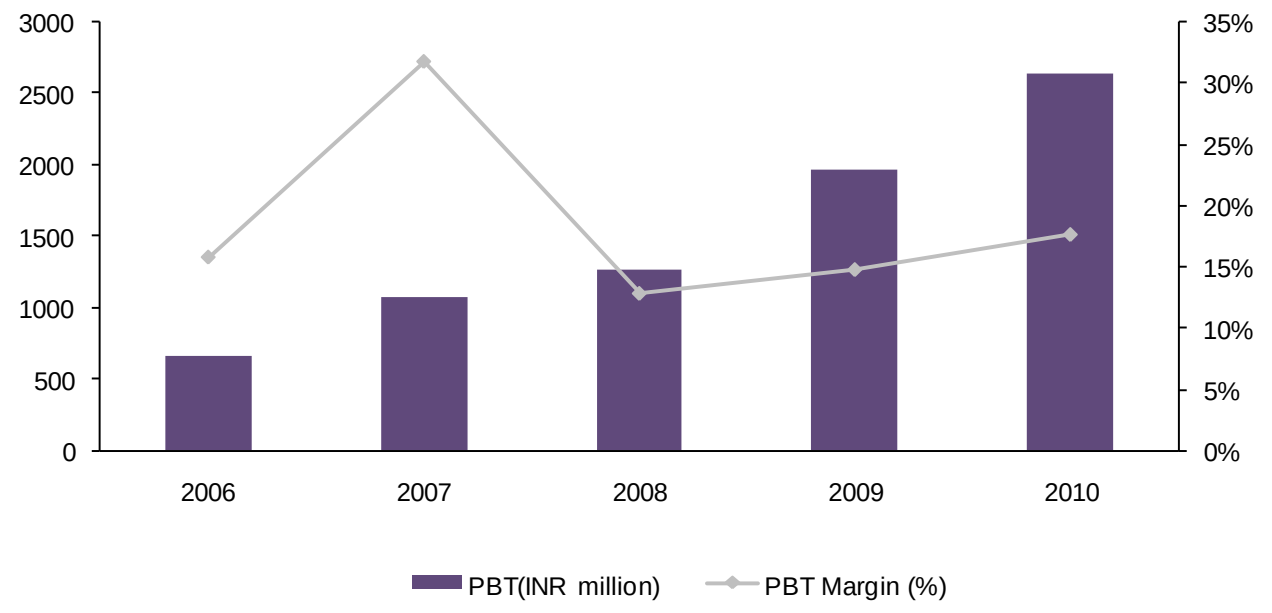
The following charts display the company’s revenue and production, profit before tax and net profit analysis during 2006–2010:

Figure 43: Goa Shipyard Limited – Revenue and Production Trend Analysis (INR Billion), 2006–2010



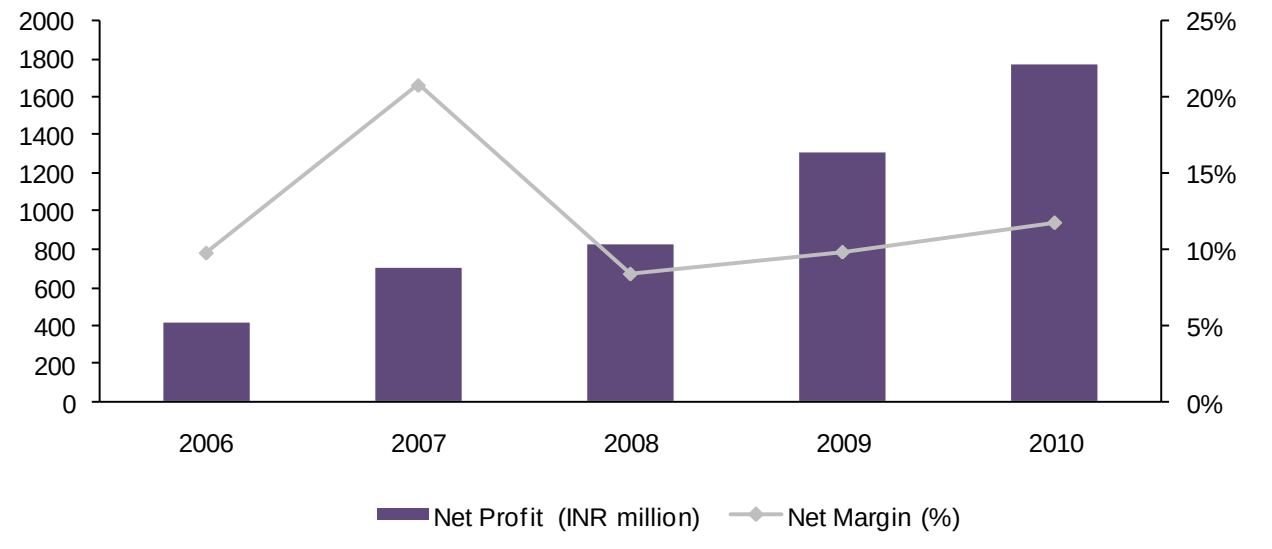
Source: Company website, annual reports and ICD Research analysis © ICD Research

Figure 44 Goa Shipyard Limited – Profit Before Tax Trend Analysis (INR Million), 2006–2010



Source: Company website, annual reports and ICD Research analysis

Figure 45: Goa Shipyard Limited – Net Profit Trend Analysis (INR Million), 2006–2010



Source: Company website, annual reports and ICD Research analysis

Published: November 2011

7.4 Key Private Sector Companies

7.4.1 Tata Advanced Systems Limited – overview

Tata Advanced Systems Limited (TASL) is a fully owned subsidiary of Tata Sons, which was established in 2007. TASL provides solutions to the Indian Security Industry, with a focus on defense, homeland security and disaster management. TASL also provides support in technology sourcing and management, the production of defense technology, obsolescence management, project execution and life-cycle support. TASL offers both cyber defense and defense equipment solutions.

7.4.2 Tata Advanced Systems Limited – main products and services

The key products offered by the company are:

Table 50: Tata Advanced Systems Limited – Main Products and Services

Products	Services
Defense	Not available
TASL offers battle space solutions that synergize the responsive efforts and resources of the forces. Some of these platforms are:	
Unmanned platforms – land, aerial, marine and sub-marine.	
Communications.	
C4ISTAR.	
Aerospace.	
Missiles and related systems and sub-systems.	
Electronic warfare.	
Network centric warfare enablers.	
Homeland security	
TASL offers solutions to organizations involved in the task of providing homeland security. Some of its initiatives are:	
Integrated security solutions.	
Platform-based surveillance systems.	
Survivability solutions.	
Disaster management	
TASL offers solutions that help to manage disaster to organizations such as the disaster and crisis management authorities, meteorological departments and the security forces. Some of its initiatives are:	
Disaster recovery and emergency response communication networks.	
Survivability solutions	

Source: Annual report, company website, primary and secondary research

7.4.3 Tata Advanced Systems Limited – recent announcements and strategic initiatives

June 2009: TASL agreed to construct an INR10 billion (US$218.2 million) Sikorsky helicopter cabin manufacturing unit, to be established at the Aerospace and Precision Engineering SEZ at Adibatla, which is expected to be commissioned by 2010.

Published: November 2011

June 2009: TASL became the sole supplier of helicopter cabins to Sikorsky Aircraft Corporation, to meet its global demand for S-92 helicopters. TASL agreed to deliver the first helicopter cabin by November 2010. TASL expects to earn revenues of US$350 million from Sikorsky Corp.

7.4.4 Tata Advanced Systems Limited – alliances

Table 51: Tata Advanced Systems Limited – Alliances

Alliance	Partner Company	Year Formed	Strategic Objectives and Focus Area
Joint venture	Lockheed Martin	2010	• **Strategic Focus:** To design, develop and manufacture aerospace and aerostructure products.
Joint venture with Sikorsky Aircraft	Sikorsky Aircraft Corporation, USA	2009	• **Product Focus:** To make aerospace components in India. The joint venture follows the contract signed in June 2009 between the two companies to assemble Sikorsky S-92 helicopter cabins. • **Market Focus:** India and international markets.
Nova Integrated Systems	Israel Aerospace Industry (IAI)	2009	• **Product Focus:** To develop, manufacture, and support a range of defense and aerospace products, including missiles, radars, electronic warfare (EW) systems and home land security systems. The new company will also perform offset work for IAI and other defense and aerospace programs in India. • **Market Focus:** India and international markets. • **Revenue Insight:** IAI will own 26% of the joint venture and Tata Advanced Systems to own 74%. The joint venture is expected to have an initial FDI of US$50 million.
MoU with Lemko Corporation	Lemko Corporation, USA	2008	• **Product Focus:** To offer solutions which include wireless communication and control applications for defense, homeland security and disaster management. • **Market Focus:** India and international markets.
Alliance with EADS	EADS	2008	• **Product Focus:** To bid for the Indian Army's US$1 billion advanced tactical communications system project. • **Market Focus:** India.
Pact with Urban Aeronautics	Urban Aeronautics, Israel	2008	• **Product Focus:** To manufacture and market unmanned aerial vehicles based on overseas technology. • **Market Focus:** India.
Joint Venture	Boeing	2008	• **Product Focus:** To form a joint venture company that will initially include more than US$500 million of defense-related aerospace component work in India for export to Boeing and its international customers. • **Market Focus:** International customers

Source: Company website and ICD Research analysis

7.4.5 Tata Advanced Systems Limited – recent contract wins

Table 52: Tata Advanced Systems Limited – Recent Contract Wins

Date	Contract Value	Client	Description
April 2009	INR1.8 billion (US$45 million)	Indian Air Force	TASL won a contract to supply 16 indigenous Akash surface to air missile (SAM) launchers to the Indian Air Force (IAF).

Source: Company website and ICD Research analysis

7.4.6 Tata Advanced Systems Limited – financial analysis

Not available

7.4.7 Mahindra Defense Systems – overview

Mahindra & Mahindra was established in 1945 and is now a US$6.3 billion multinational company. The company is engaged in the production of light combat and armored vehicles and tractors, with a growing involvement in information technology, financial services, tourism, infrastructure development, trade and logistics. Mahindra ventured into specialty businesses in 2001, which include Mahindra AshTech, Mahindra Defense, Mahindra Logistics and Spares Business Unit.

Mahindra Defense Systems (MDS) oversees the requirements of the defense industry. It provides total solutions for the entire range of light combat and armored vehicles, and their derivatives, for defense and security forces. The company also addresses specific divisions of the government's import substitution and indigenization programs, such as Small Arms and Sea Mines. The group has been issued industrial licenses for light armored multi-role vehicles, simulators for weapons and weapons systems, mobile surveillance platforms, sea mines, small arms, variants and associated ammunition, and up-armored vehicles by the Indian government.

7.4.8 Mahindra Defense Systems – main products and services

The key products offered by the company are:

Table 53: Mahindra Defense Systems – Main Products and Services

Products	Services
Military Light Utility Vehicles	Not available
Mahindra MM 500XDB.	
Mahindra field ambulances.	
Mahindra pickups.	
Bullet Proof Vehicle	
Rakshak.	
Up- Armored Vehicles	
Cash in transit vans.	
Special Vehicles	
Mobile surveillance vehicle.	
Rapid intervention vehicle	

Source: Annual report, company website, primary and secondary research

7.4.9 Mahindra Defense Systems – recent announcements and strategic initiatives

November 2009: Mahindra Defense Systems announced that it will bid for domestic defense projects worth US$3.5 billion over the next seven years. Most of the projects are anticipated to be from artillery systems and armored vehicles.

March 2009: Mahindra Defense Systems inaugurated the Mahindra Special Military Vehicles (MSMV) facility at Prithla, Faridabad. Apart from manufacturing specialized vehicles for the armed forces, paramilitary forces and police, the MSMV facility is also equipped to undertake vehicle development, armoring and conversions. The plant also has a facility for research and development, product development, design and prototyping of special vehicles to meet specific customer requirements.

7.4.10 Mahindra Defense Systems – alliances

Table 54: Mahindra Defense Systems – Alliances

Alliance	Partner Company	Year Formed	Strategic Objectives and Focus Area
Mahindra & Mahindra Ltd and BAE Systems	BAE Systems	2009	• **Product Focus:** To establish a land systems' focused, joint venture defense company, based in India. The joint venture company will be headquartered in New Delhi, with manufacturing at a purpose-built facility located south of Faridabad. The joint venture's existing projects include the axe high mobility vehicle, as well as up-armored and bulletproof Scorpios, Boleros, Rakshak, Rapid Intervention Vehicles and the Marksman light armored vehicle. • **Market Focus:** India. • **Revenue Insight:** Both companies will invest US$21.3 million over a three year period. The company's equity split will be 74% Mahindra and 26% BAE Systems.
Mahindra Satyam and SAAB	SAAB	2009	• **Product Focus:** To establish a Centre of Excellence for Network Centric Warfare (CoE-NCW) that will offer comprehensive skills and a repository of tools, systems, middleware, integration platforms and system showcases in the field of NCW. This will be a development center for mission critical applications and C4I solutions. The capabilities of the CoE shall also span in the area of homeland security, where focus is planned on end to end security solutions. • **Market Focus:** India and international markets.
Mahindra Special Services Group (MSSG) and the Israel Export and International Cooperation Institute (IEICI)	The Israel Export and International Cooperation Institute (IEICI)	2009	• **Product Focus:** MSSG will be the homeland security partner for the IEICI. The Indian firm will guide relevant participating Israeli companies into the Indian market by providing India specific market intelligence. This development will enhance the exchange of ideas, expertise and technologies between Israel and India. • **Market Focus:** India
Mahindra Defense Systems and Seabird Aviation, Jordan	Seabird Aviation Jordan	2007	• **Product Focus:** To supply the Seabird SEEKER range of aircraft into India. The strategic intent of this partnership is to enable the SEEKER to be assembled, supplied and

Table 54: Mahindra Defense Systems – Alliances

			supported out of India. • **Market Focus:** India and the international markets.
Mahindra Defense Systems (MDS) and Lockheed Martin Information Systems	MDS and Lockheed Martin Information Systems	2003	• **Product Focus:** To jointly develop simulators for the Indian defense forces • **Market Focus:** India

Source: Company website and ICD Research analysis

7.4.11 Mahindra Defense Systems – recent contract wins

Not available.

7.4.12 Mahindra Defense Systems – financial analysis

Not available.

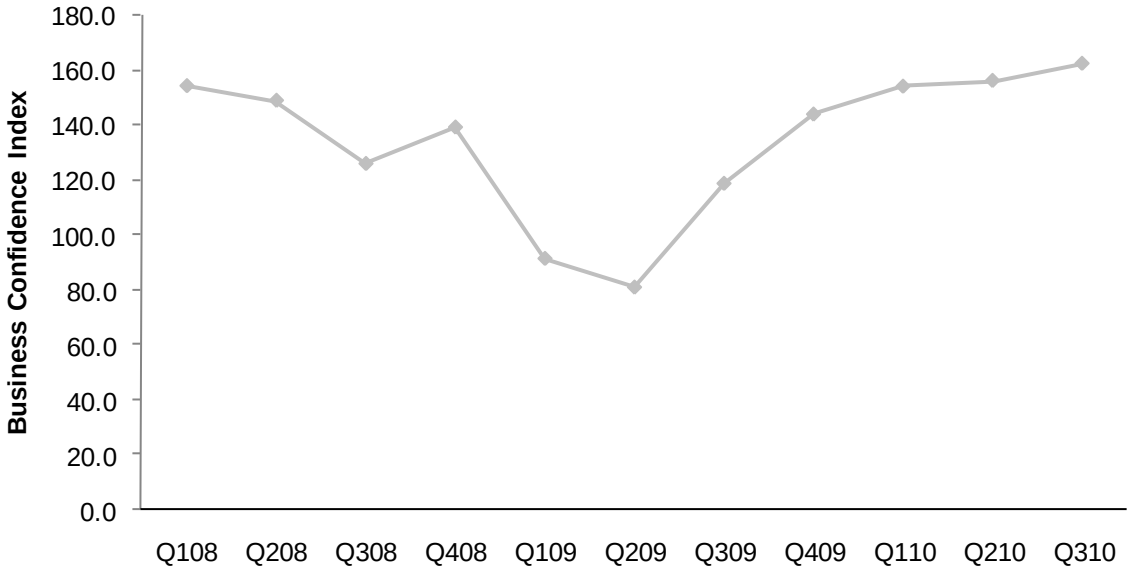
8 Business Environment and Country Risk

8.1 Business Confidence

8.1.1 Business confidence index

According to the National Council for Applied Economic Research (NCAER), business confidence has been improving steadily since 2009, following the global financial crisis in 2008. Business confidence is expected to continue improving in 2011.

Figure 46: Indian Business Confidence Index, 2007–2010

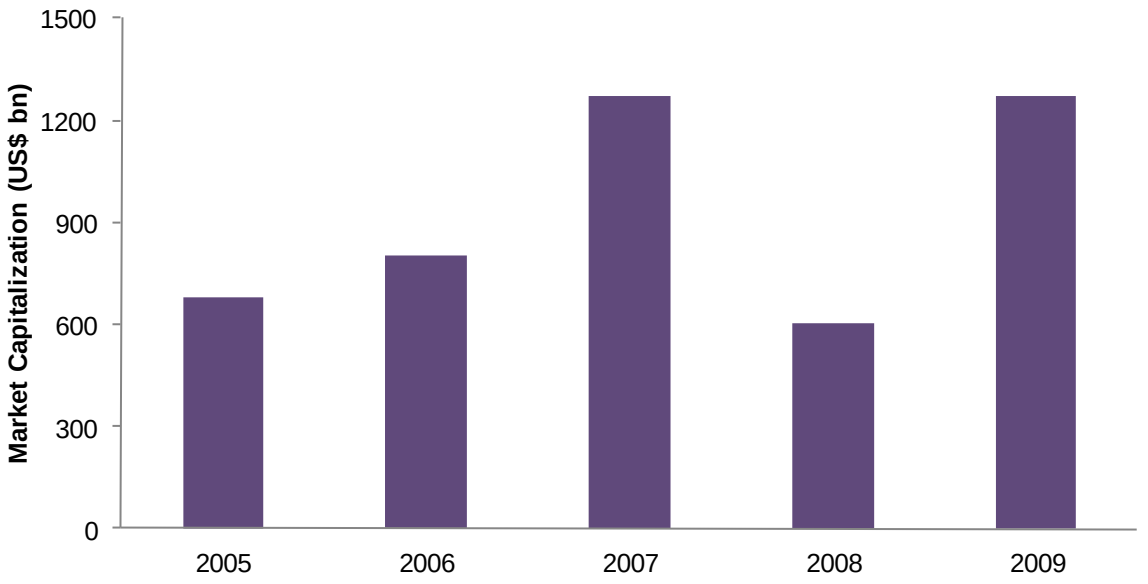


Source: NCAER and ICD Research analysis

8.1.2 Market capitalization trend – Bombay Stock Exchange, India

After a sharp decline in 2008, which was triggered by the global financial crisis, the Indian stock market began to recover in 2009, almost matching the market capitalization levels it reached in 2007. The country's strong economic fundamentals and steady performance across a number of industries are expected to cause continued investments entering the market. However, levels will be affected by events in the global market space, especially in Europe and the US. Overall, markets are not expected to show significant improvement from the current levels during the forecast period.

Figure 47: Bombay Stock Exchange Market Capitalization (US$ Billion), 2005–2010

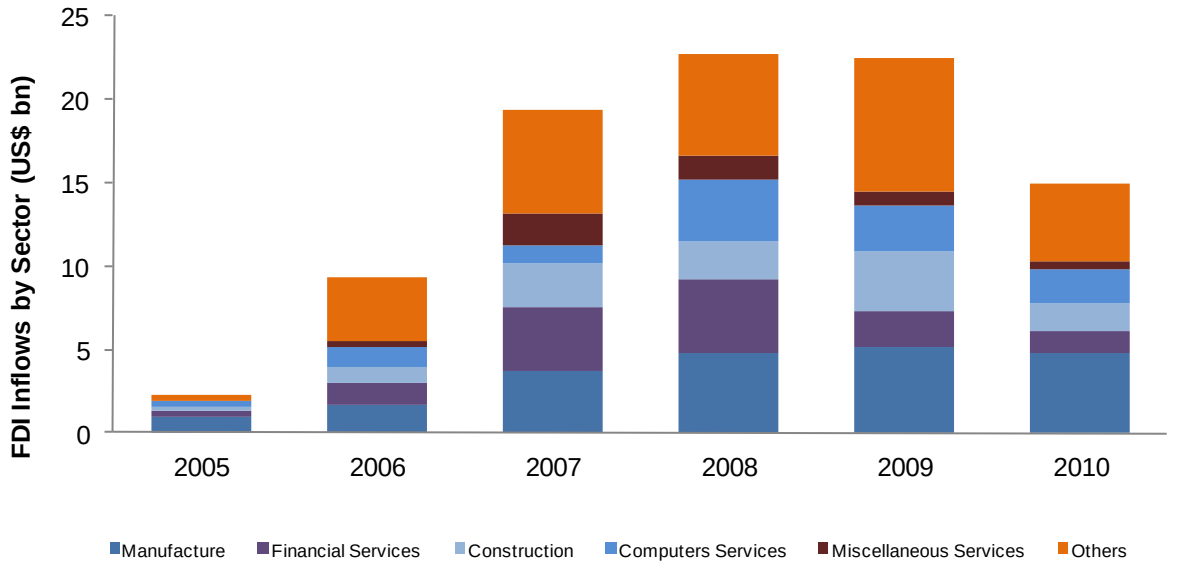


Source: Bombay Stock Exchange of India and ICD Research analysis

8.1.3 FDI inflows by sector

FDI inflows decreased in the financial services and real estate sectors, while IT and communication services continued to attract investments. This trend is expected to continue throughout 2011.

Figure 48: Indian FDI Inflows by Sector (US$ Billion), 2005–2010

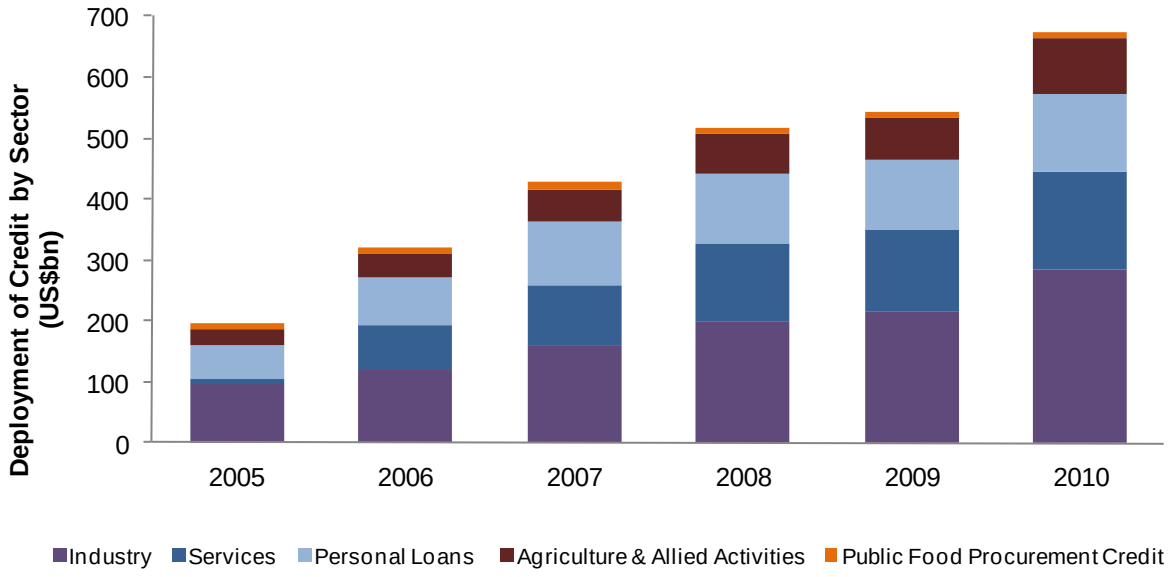


Source: Reserve Bank of India and ICD Research analysis

8.1.4 Deployment of credit by sector

Overall, the core industries attracted the majority of the country's credit deployment, which grew at a CAGR of 27.83% during the review period.

Figure 49: Indian Deployment of Credit by Sector (US$ Billion), 2005–2010



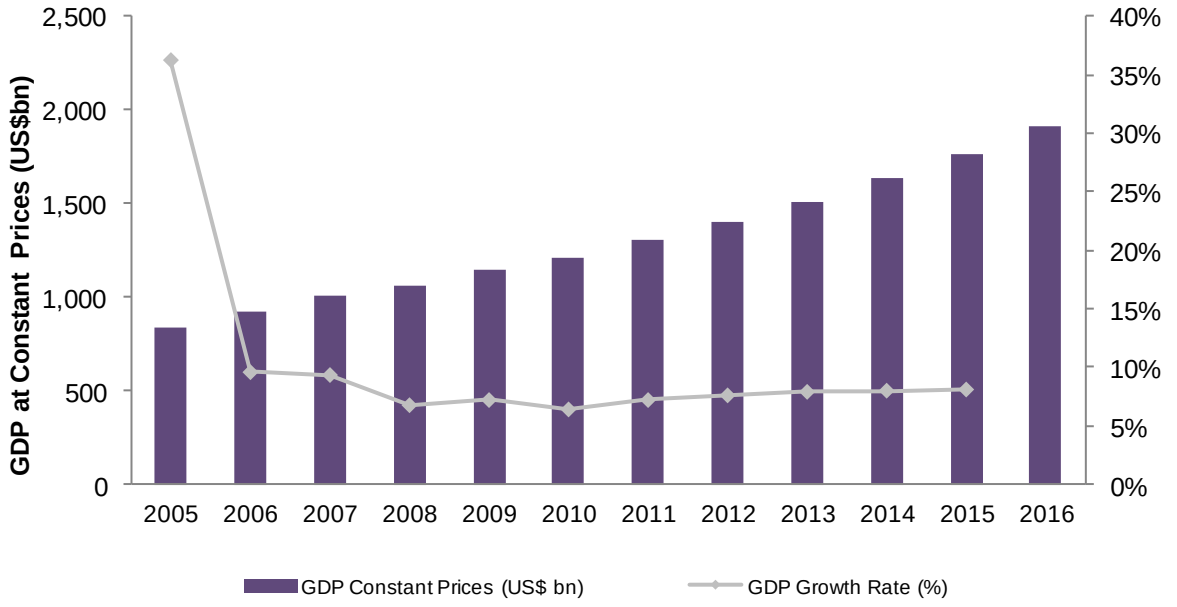
Source: Reserve Bank of India and ICD Research analysis

8.2 Economic Performance

8.2.1 GDP at constant prices

In 2010, GDP at constant prices stood at US$1,214.2 billion, recording a CAGR of 7.63% during the review period. However, the growth rate declined from 9.6% in 2006 to 6.4% in 2010, due to the global economic slowdown. GDP growth during the forecast period is expected to be robust, increasing at a CAGR of 7.96%, to reach US$1,908.9 billion in 2016.

Figure 50: Indian GDP Value at Constant Prices (US$ Billion), 2005–2016

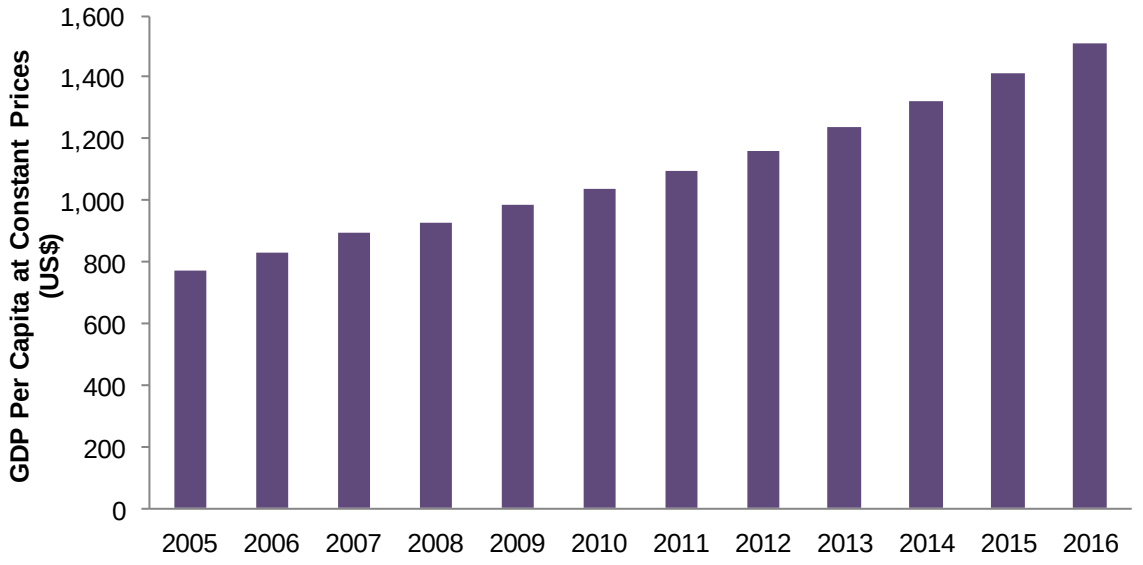


Source: Reserve Bank of India and ICD Research analysis

8.2.2 GDP per capita at constant prices

GDP per capita at constant prices stood at US$1,035 in 2010, recording a CAGR of 6.08% during the review period. GDP per capita is expected to be robust, increasing at a CAGR of 6.60% during the forecast period, to reach US$1,506.8 in 2016.

Figure 51: Indian GDP Per Capita at Constant Prices (US$), 2005–2016

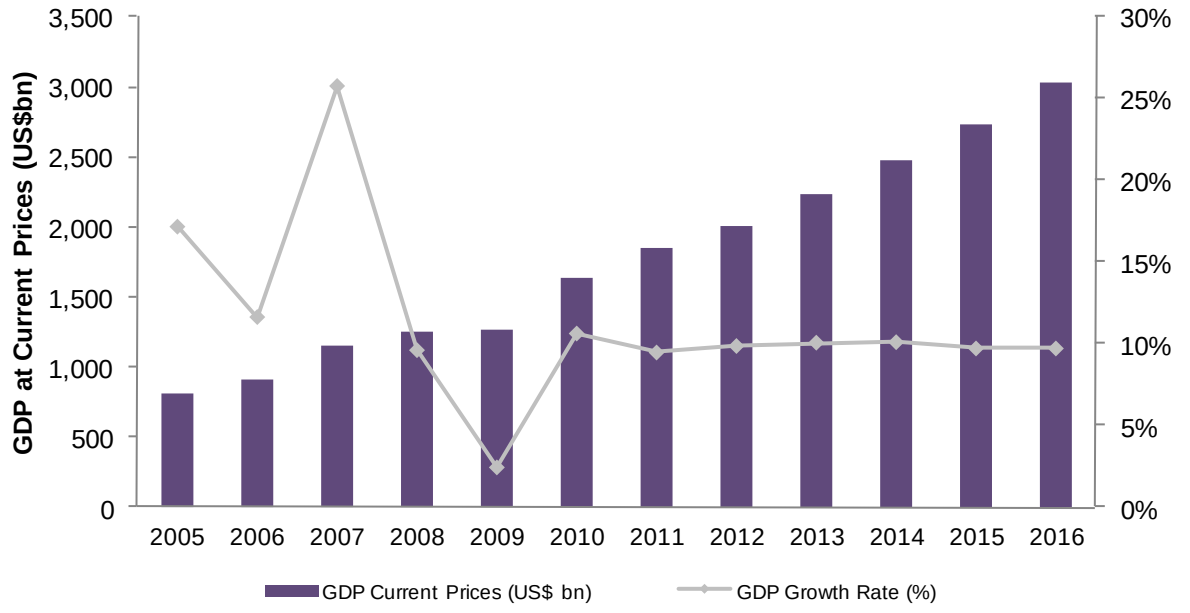


Source: Reserve Bank of India and ICD Research analysis

8.2.3 GDP at current prices

GDP at current prices stood at US$1,632 billion in 2010, recording a CAGR of 15.08% during the review period. However, the growth rate declined from 25.8% in 2007, to 10.6% in 2010, as a result of the global economic slowdown and high inflation. During the forecast period, GDP growth is expected to grow at a CAGR of 10.43%, to reach US$3,026.9 billion in 2016.

Figure 52: Indian GDP at Current Prices (US$ Billion), 2005–2016

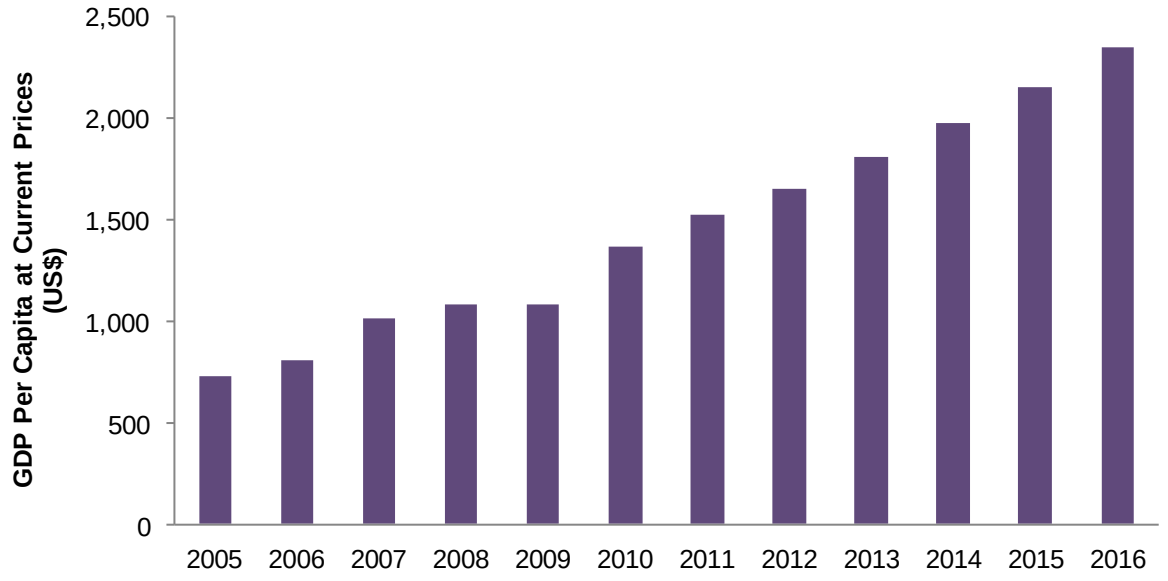


Source: ICD Research analysis

8.2.4 GDP per capita at current prices

GDP per capita at current prices valued US$1,370.8 in 2010, having grown at a CAGR of 13.48% during the review period. GDP per capita is expected to achieve a CAGR of 8.99% during the forecast period, to reach US$2,348.6 in 2016.

Figure 53: Indian GDP Per Capita at Current Prices (US$), 2005–2016

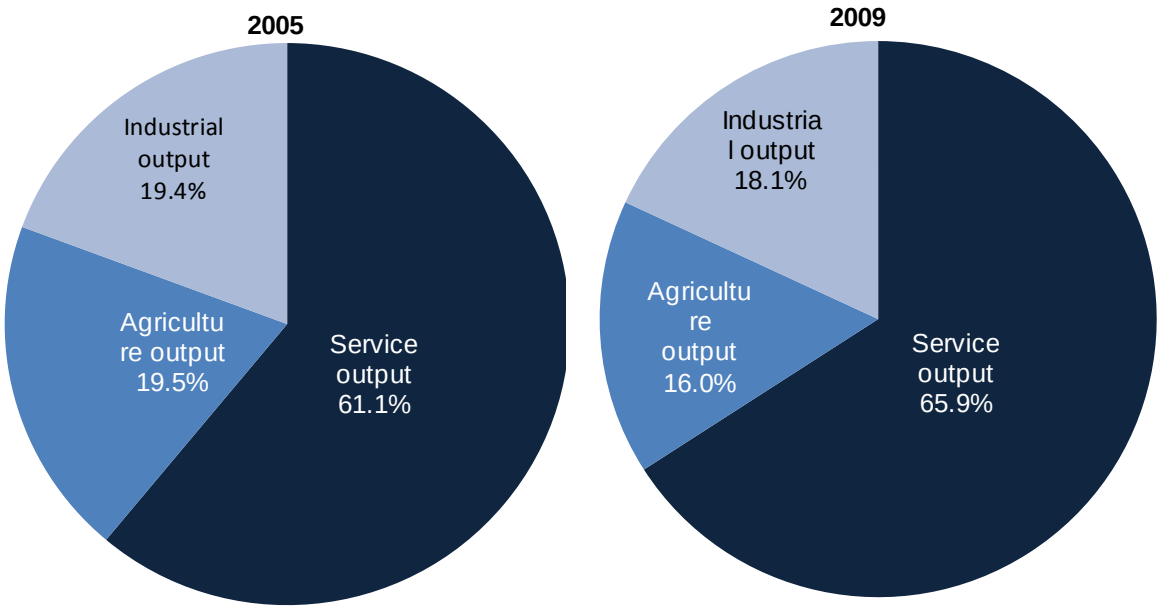


Source: World Bank and ICD Research analysis

8.2.5 GDP split by key sectors

The service sector's contribution to India's overall GDP increased to 65.9% in 2009, from 61.1% in 2005. The agriculture sector's contribution to the country's overall GDP declined to 16% in 2009, from 19.5% in 2005. The industrial sector's contribution to the country's overall GDP marginally declined to 18.1% in 2009, from 19.4% in 2005. The service sector was the Indian economy's major growth driver during the review period. This trend is expected to be maintained during the forecast period, as a result of strong demand for Indian IT and knowledge process outsourcing services.

Figure 54: Indian GDP Split by Key Sectors (%) 2005 vs 2009

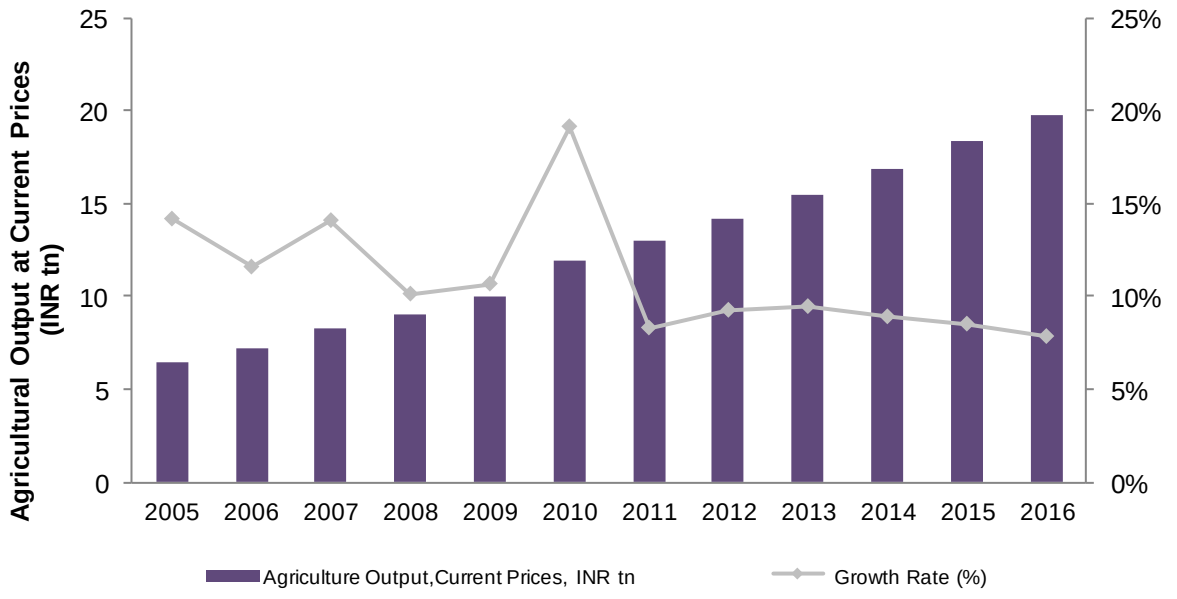


Source: Reserve Bank of India and ICD Research analysis

8.2.6 Agriculture – agricultural output value at current prices (INR trillion)

The agricultural output value at current prices was INR12.0 trillion in 2010, having grown at a CAGR of 13.11% during the review period. This sector is set to grow at a strong CAGR of 8.82% during the forecast period, to reach INR19.8 trillion by 2016

Figure 55: Indian Agricultural Output Value at Current Prices (INR Trillion), 2005–2016

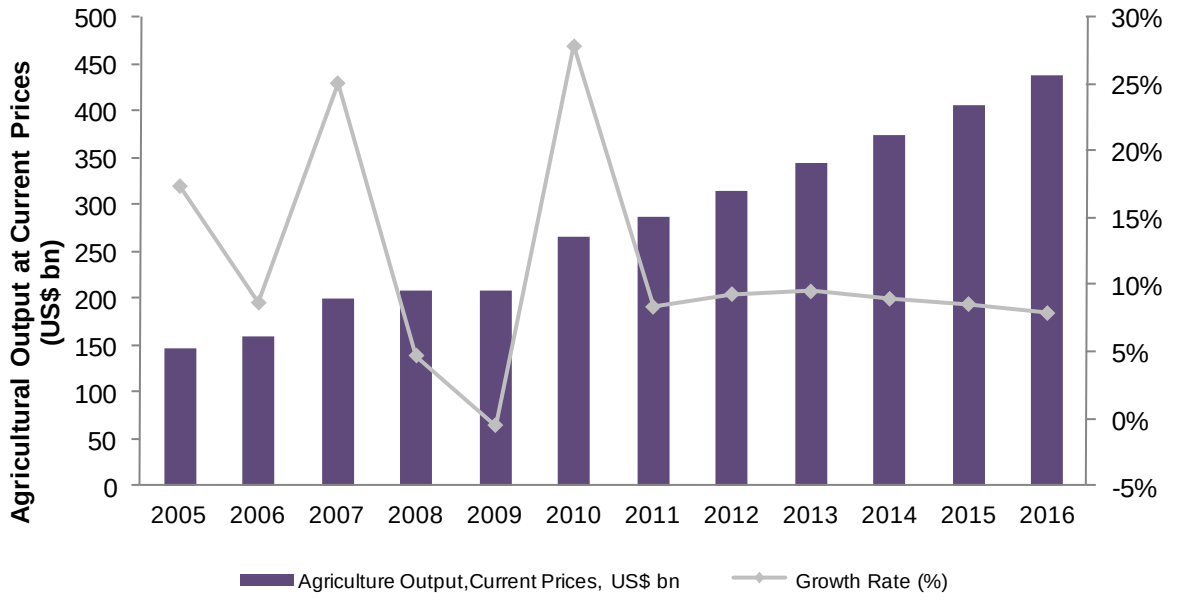


Source: United Nations Statistics Division and ICD Research analysis

8.2.7 Agriculture – agricultural output value at current prices (US billion)

The agricultural output value at current prices valued US$265.2 billion in 2010, having grown at a CAGR of 12.58% during the review period. This sector is set to grow at a steady CAGR of 8.82% during the forecast period. It is expected to reach US$438.4 billion by 2016

Figure 56: Indian Agricultural Output Value at Current Prices (US Billion), 2005–2016

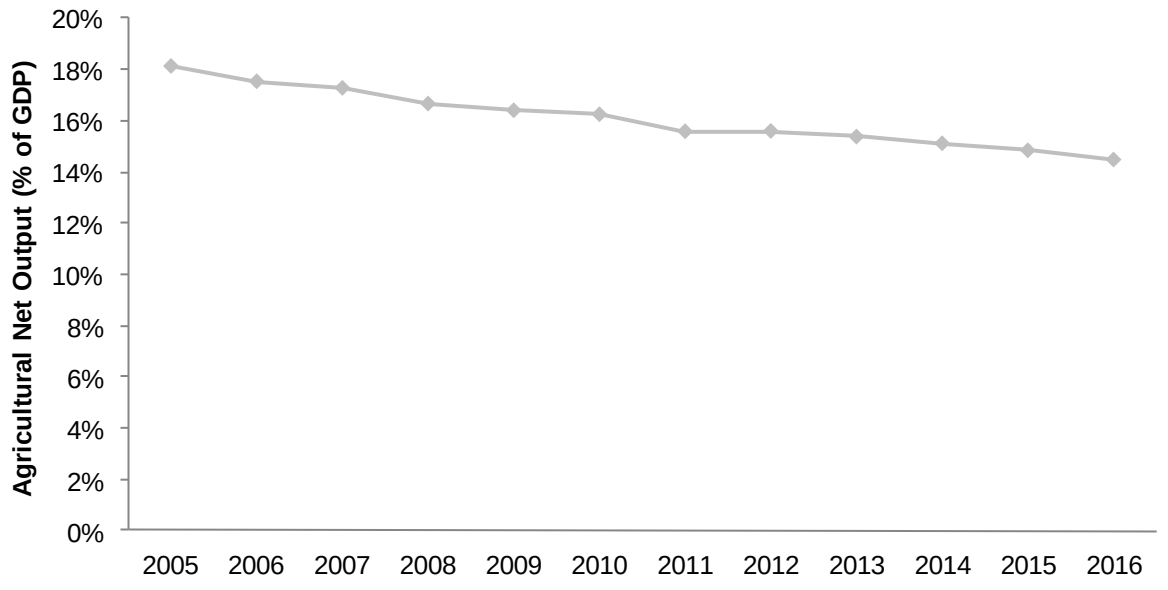


Source: United Nations Statistics Division and ICD Research analysis

8.2.8 Agriculture – agricultural output at current prices as a percentage of GDP

The agricultural output as a percentage of GDP stood at 16.3% in 2010, as compared to 18.9% in 2005. It is expected to reach 14.5% of GDP by 2016

Figure 57: Indian Agricultural Output at Current Prices as a Percentage of GDP, 2005–2016

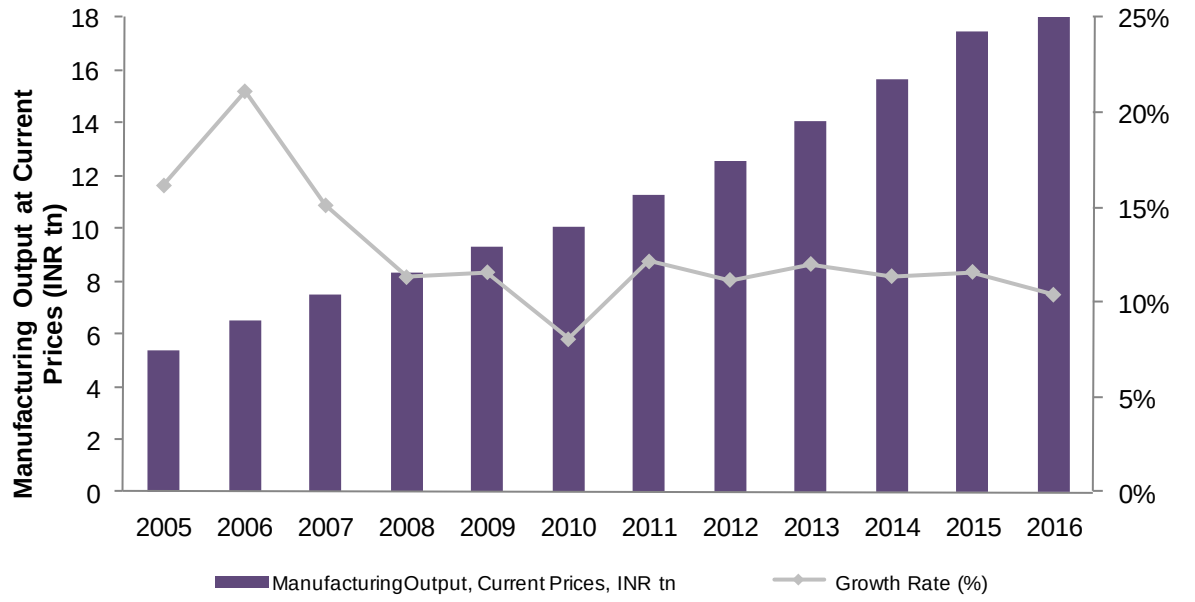


Source: United Nations Statistics Division and ICD Research analysis

8.2.9 Manufacturing – manufacturing output at current prices (INR trillion)

Manufacturing output at current prices valued INR10.1 trillion in 2010, grown at a CAGR of 13.34% during the review period. The manufacturing sector is expected to grow at a CAGR of 11.31% during the forecast period, due to growth in domestic consumption. It is expected to reach INR19.3 trillion by 2016.

Figure 58: Indian Manufacturing Output at Current Prices (INR Trillion), 2005–2016

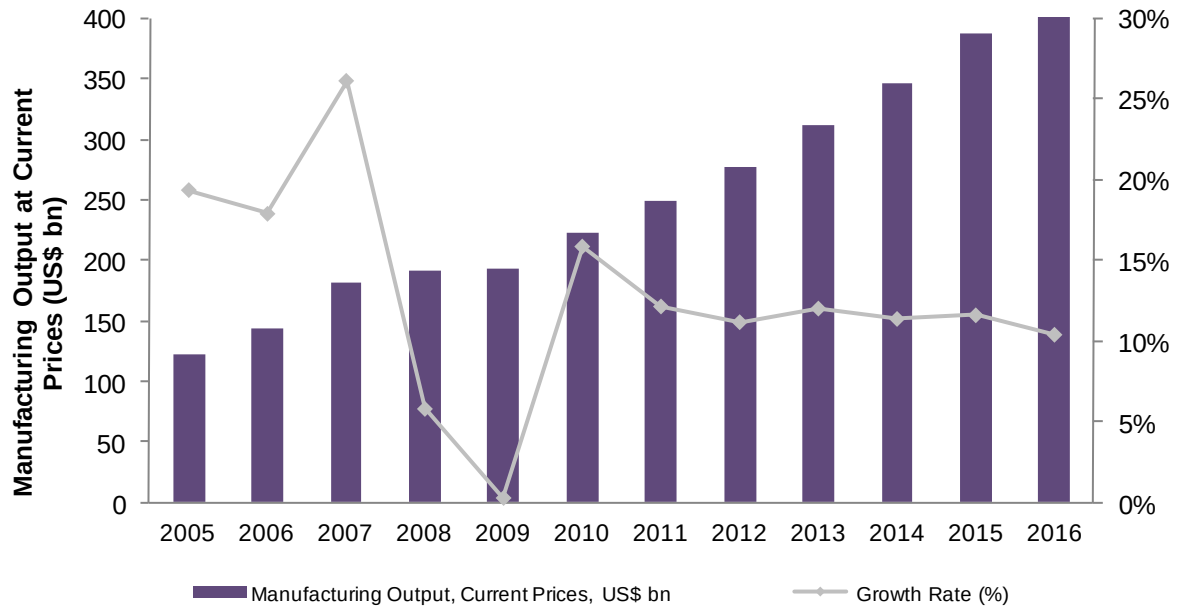


Source: United Nations Statistics Division and ICD Research analysis

8.2.10 Manufacturing – manufacturing output at current prices (US billion)

The manufacturing output at current prices valued US$222.8 billion in 2010, having grown at a CAGR of 12.82% during the review period. The manufacturing sector is expected to grow at a CAGR of 11.31% during the forecast period, due to growth in domestic consumption. It is expected to reach US$426.9 billion by 2016.

Figure 59: Indian Manufacturing Output at Current Prices (US Billion), 2005–2016

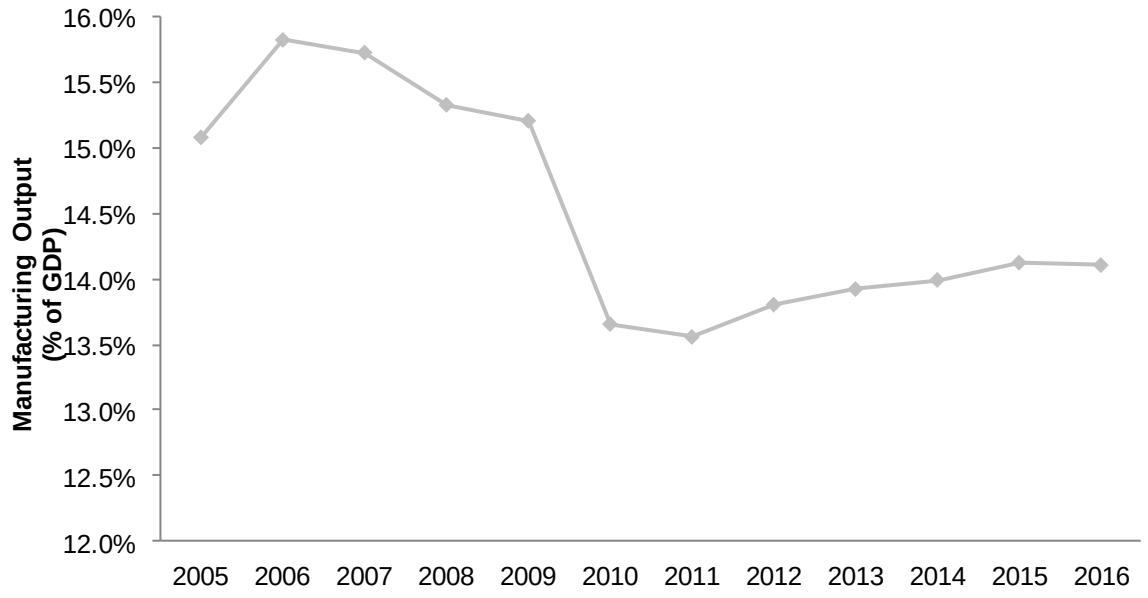


Source: United Nations Statistics Division and ICD Research analysis

8.2.11 Manufacturing – manufacturing output at current prices as a percentage of GDP

The manufacturing output at current prices as a percentage of GDP increased from 15.1% in 2005 to 13.7% in 2010. The manufacturing output as a percentage of GDP is expected to grow during the forecast period and reach 14.1% in 2016.

Figure 60: Indian Manufacturing Output at Current Prices as a Percentage of GDP, 2005–2016

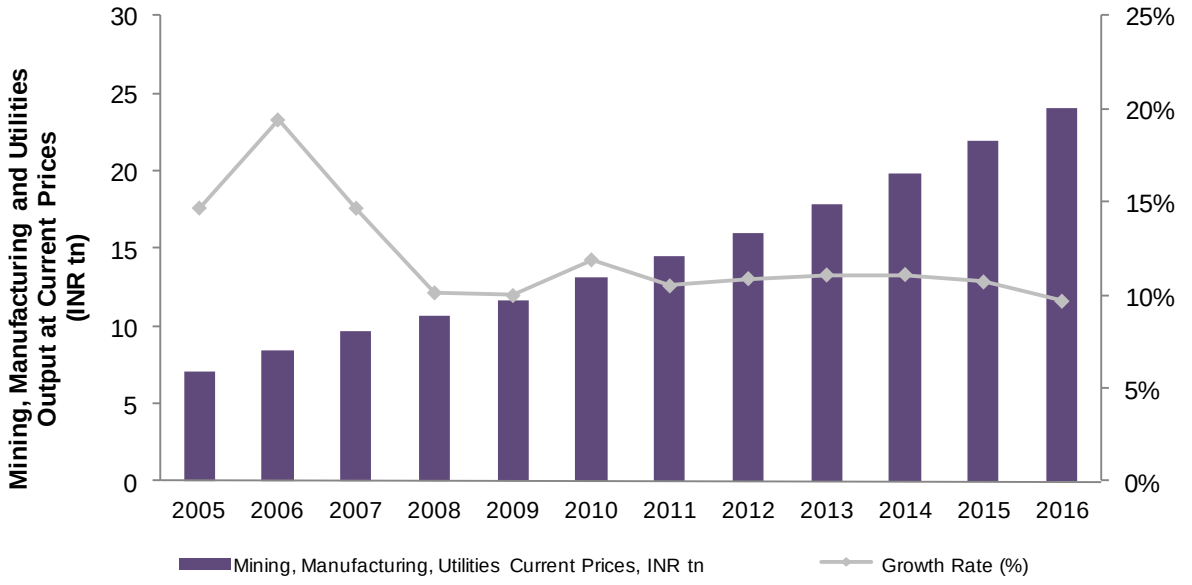


Source: United Nations Statistics Division and ICD Research analysis

8.2.12 Manufacturing – mining, manufacturing and utilities at current prices (INR trillion)

The combined output of mining, manufacturing and utilities at current prices valued INR13.1 trillion in 2010, having grown at a CAGR of 13.15% during the review period. The growth in mining, manufacturing and utilities is the result of increasing demand from the real estate and construction industries. This sector is forecast to grow at a CAGR of 10.68% during the forecast period, to achieve a combined output of INR24.0 trillion in 2016.

Figure 61: Indian Mining, Manufacturing and Utilities Output at Current Prices (INR Trillion), 2005–2016

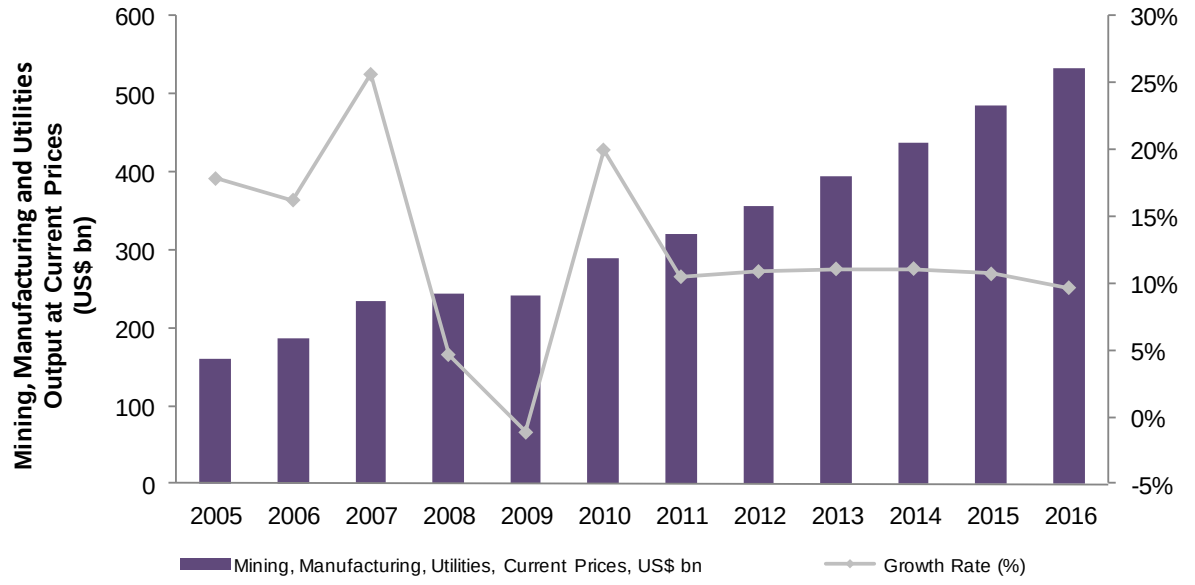


Source: ICD Research analysis

8.2.13 Manufacturing – mining, manufacturing and utilities at current prices (US billion)

The combined output of mining, manufacturing and utilities at current prices reached US$289.8 billion in 2010, having grown at a CAGR of 12.63% during the review period. The sector is forecast to grow at a CAGR of 10.68% during the forecast period, to achieve a combined output of US$532.1 billion in 2016.

Figure 62: Indian Mining, Manufacturing and Utilities Output at Current Prices (US Billion), 2005–2016

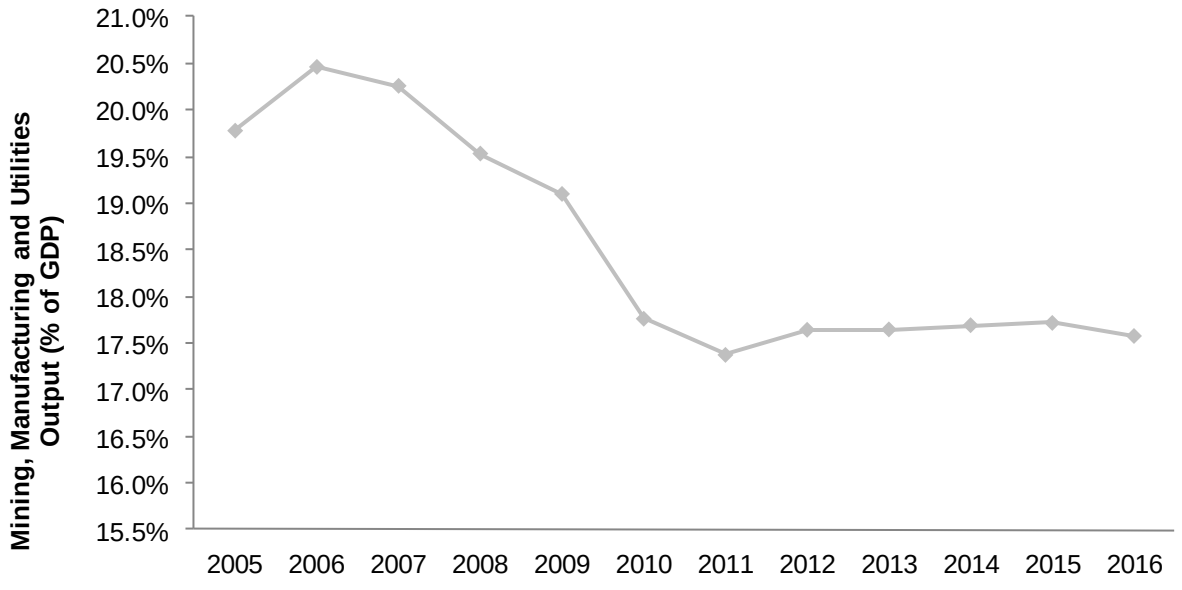


Source: ICD Research analysis

8.2.14 Manufacturing – mining, manufacturing and utilities at current prices as a percentage of GDP

In 2010, the combined output of mining, manufacturing and utilities at current prices as a percentage of GDP decreased to 17.8%, from 19.8% in 2005. These sub-sectors are expected to contribute 17.6% by 2016.

Figure 63: Indian Mining, Manufacturing and Utilities Output at Current Prices as a Percentage of GDP, 2005–2016

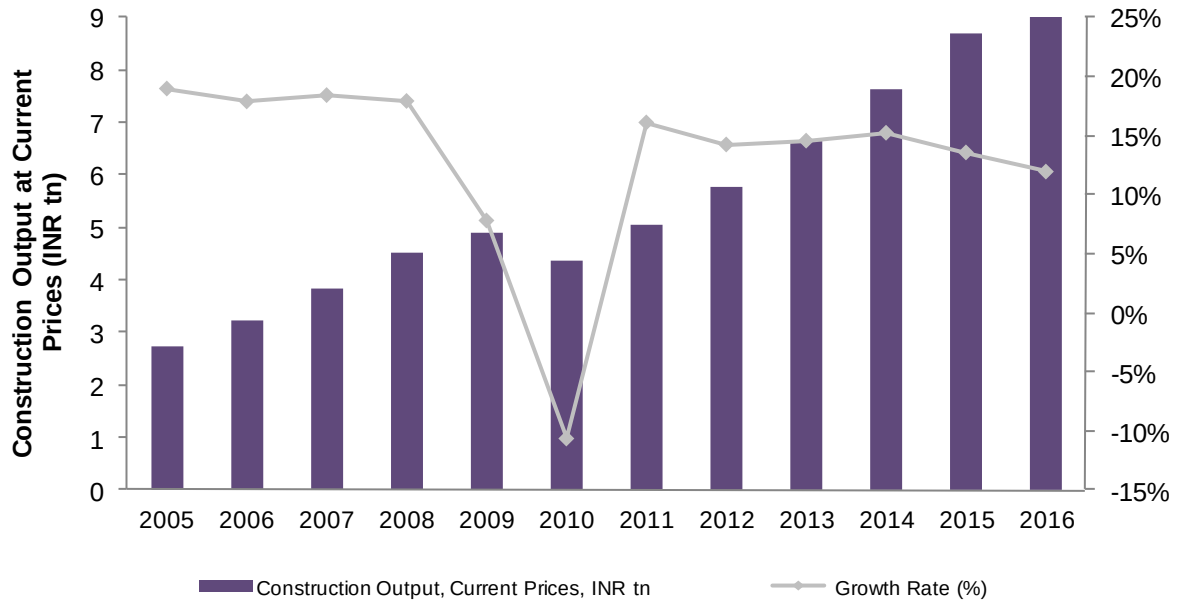


Source: ICD Research analysis

8.2.15 Construction – construction output at current prices (INR trillion)

The construction output at current prices valued INR4.4 trillion in 2010, having grown at a CAGR of 9.67% during the review period. This sector is expected to grow at a strong CAGR of 13.91% during the forecast period, supported by the growth in domestic demand. It is expected to reach INR9.7 trillion by 2016.

Figure 64: Indian Construction Output at Current Prices (INR Trillion), 2005–2016

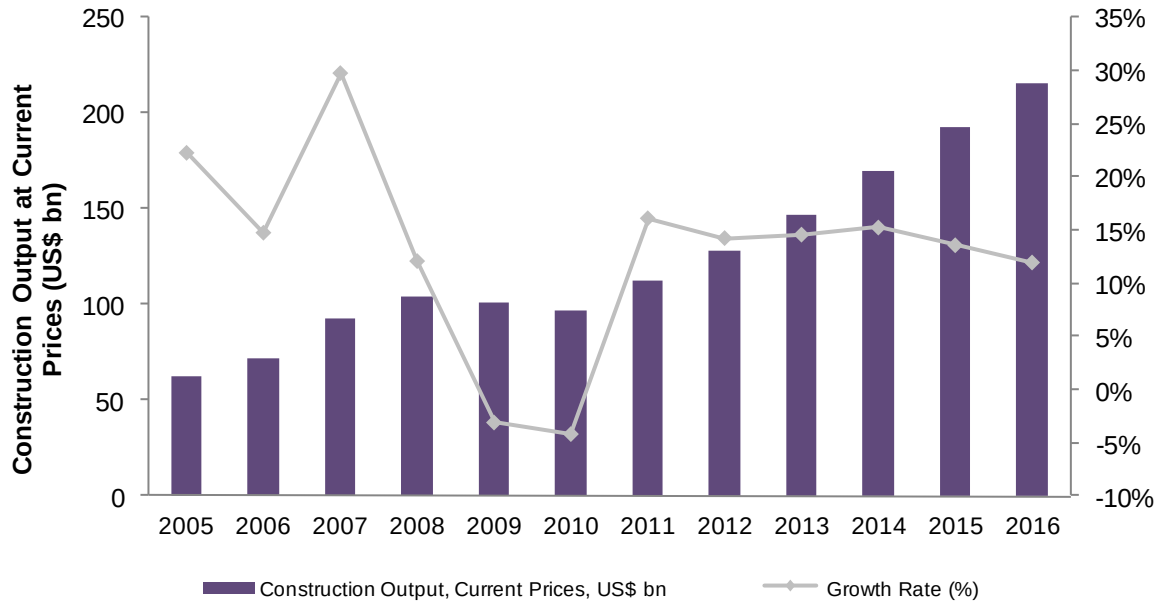


Source: ICD Research analysis

8.2.16 Construction – construction output at current prices (US billion)

Construction output at current prices valued US$96.7 billion in 2010, having grown at a CAGR of 9.16% during the review period. Due to growth in domestic demand, the construction sector is expected to grow at a CAGR of 13.91% during the forecast period, to reach US$215.2 billion by 2016.

Figure 65: Indian Construction Output at Current Prices (US Billion), 2005–2016

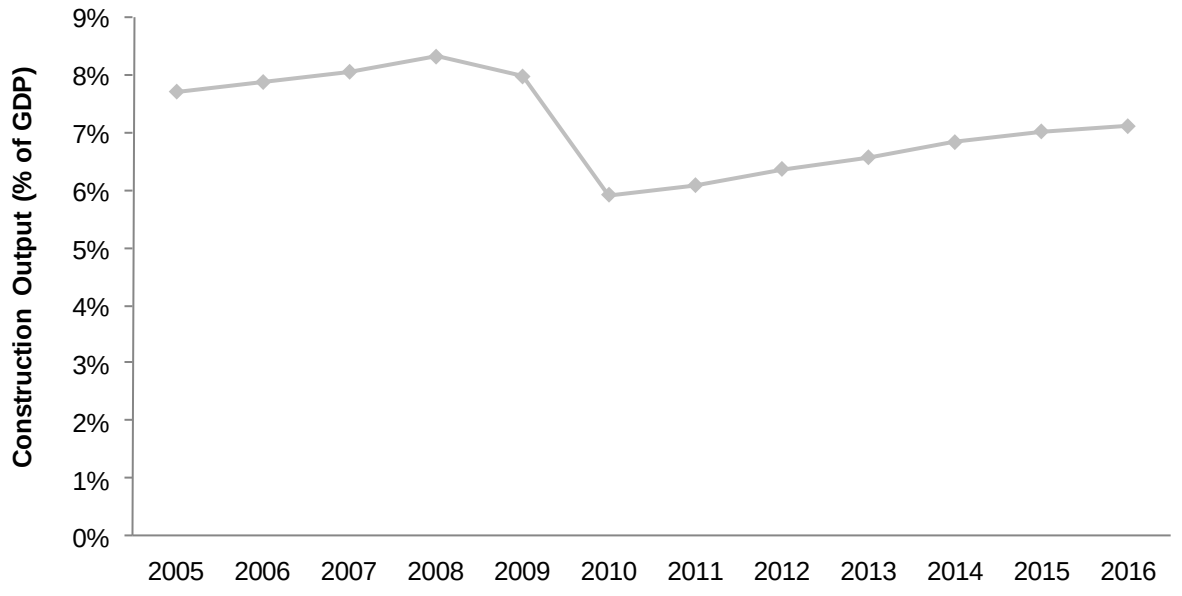


Source: ICD Research analysis

8.2.17 Construction – construction output at current prices as a percentage of GDP

Construction output at current prices as a percentage of GDP declined from 7.7% in 2005 to 5.9% in 2010. It is expected to reach 7.1% of GDP by 2016

Figure 66: Indian Construction Output at Current Prices as a Percentage of GDP, 2005–2016

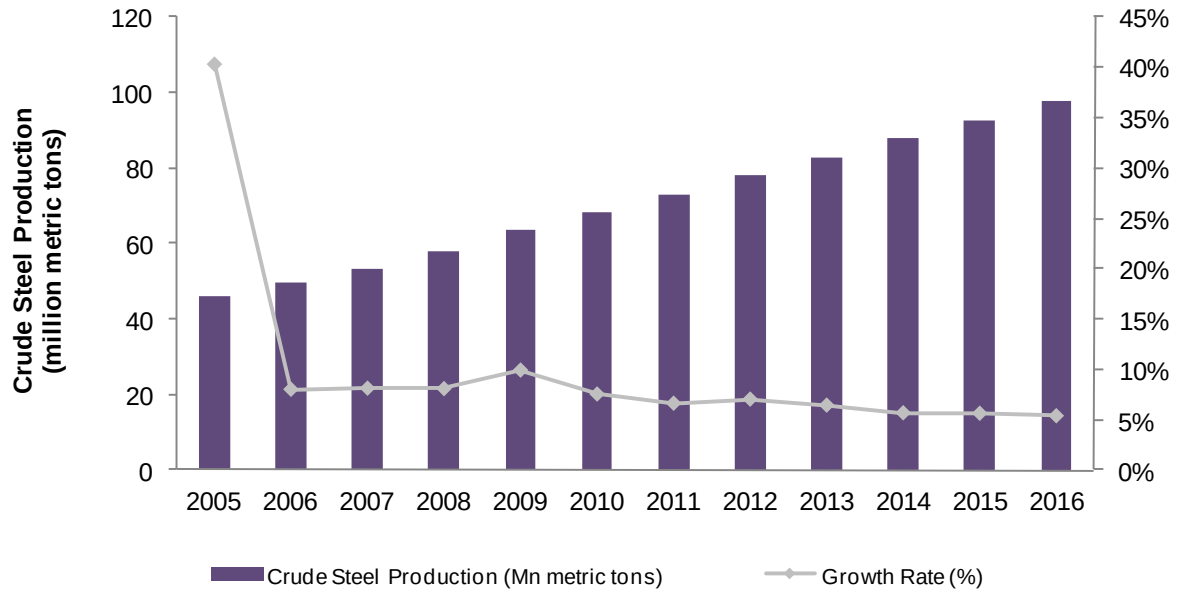


Source: ICD Research analysis

8.2.18 Industry – crude steel production

Crude steel production stood at 68.3 million tons (MT) in 2010, recorded a CAGR of 8.34% during the review period. Crude steel is expected to register strong growth, achieving a CAGR of 6.04% during the forecast period, to reach 97.7 million tons by 2016.

Figure 67: Indian Crude Steel Production (Million Tons), 2005–2016

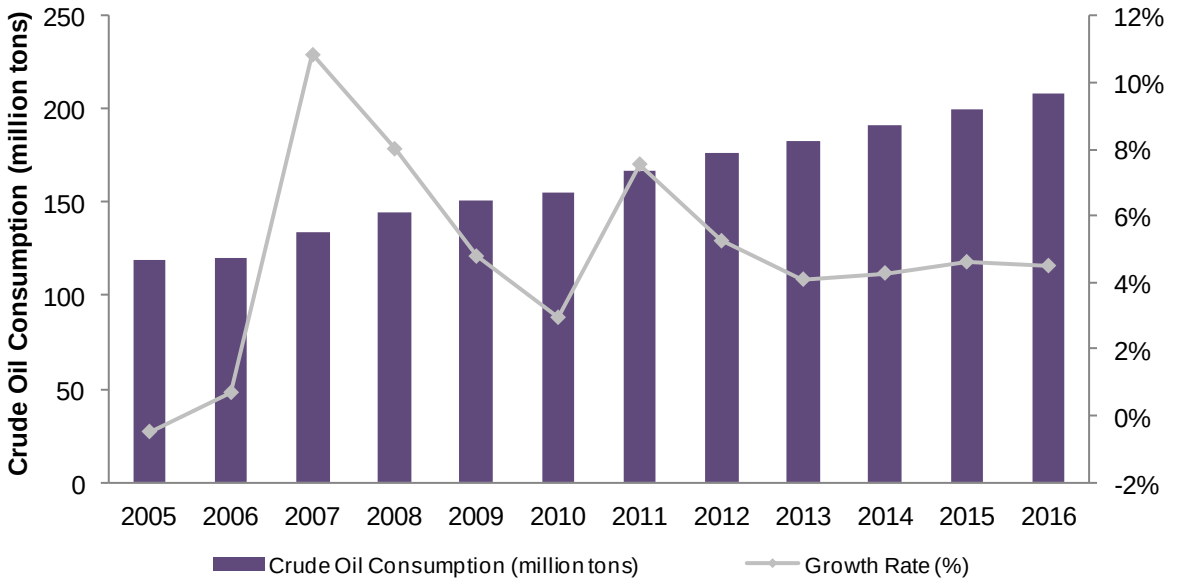


Source: ICD Research analysis

8.2.19 Industry – crude oil consumption

Crude oil consumption was 155.5 million tons (MT) in 2010, recording a CAGR of 5.39% during the review period. Crude oil consumption is expected to grow at a CAGR of 4.55% during the forecast period, to reach 208.8 million tons by 2016.

Figure 68: Indian Crude Oil Consumption (Million Tons), 2005–2016

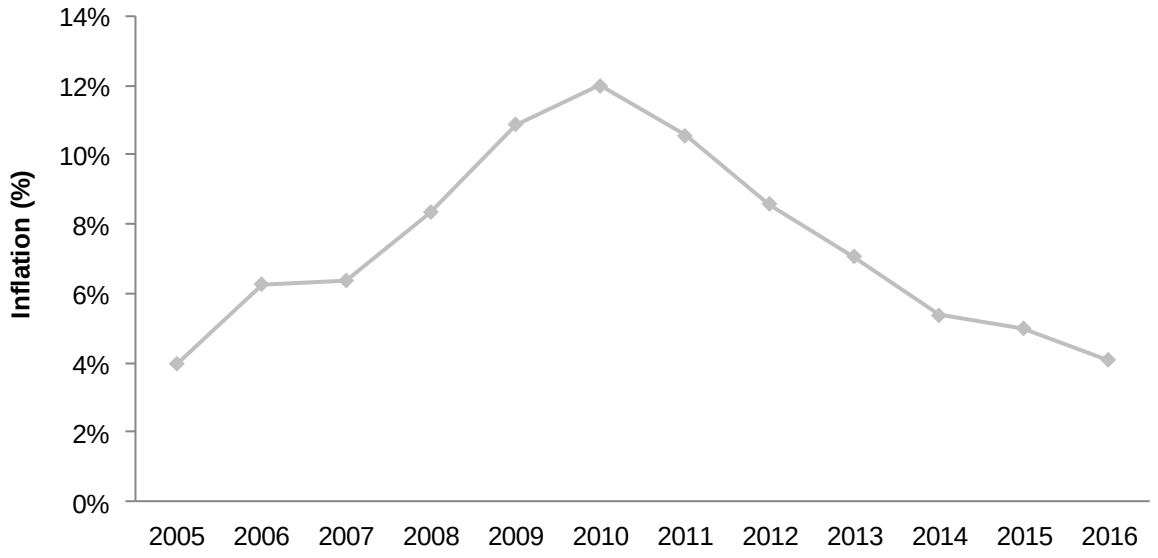


Source: ICD Research analysis

8.2.20 Inflation rate

The inflation rate increased to 12.0% in 2010, from 4.0% in 2005. Inflation is forecast to decline to 4.1% by 2016.

Figure 69: Indian Inflation Rate (%), 2005–2016

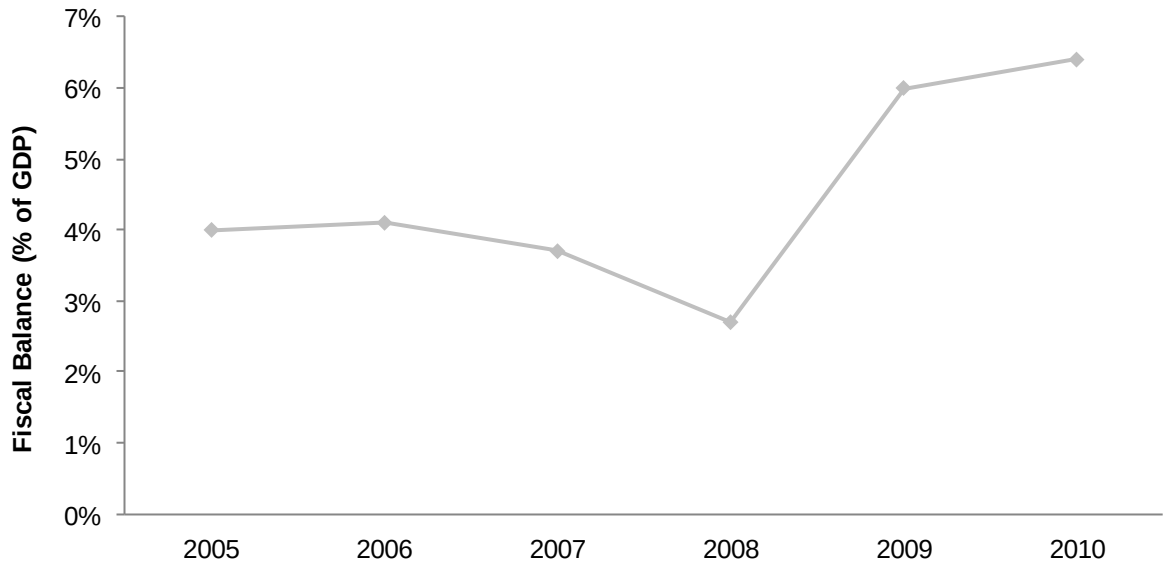


Source: ICD Research analysis

8.2.21 Fiscal deficit as a percentage of GDP

Fiscal deficit as a percentage of GDP increased to its highest level of 6.4% in 2010 due to the economic stimulus packages launched by the Indian government from 4.0% in 2005.

Figure 70: Indian Fiscal Deficit as a Percentage of GDP, 2005–2010

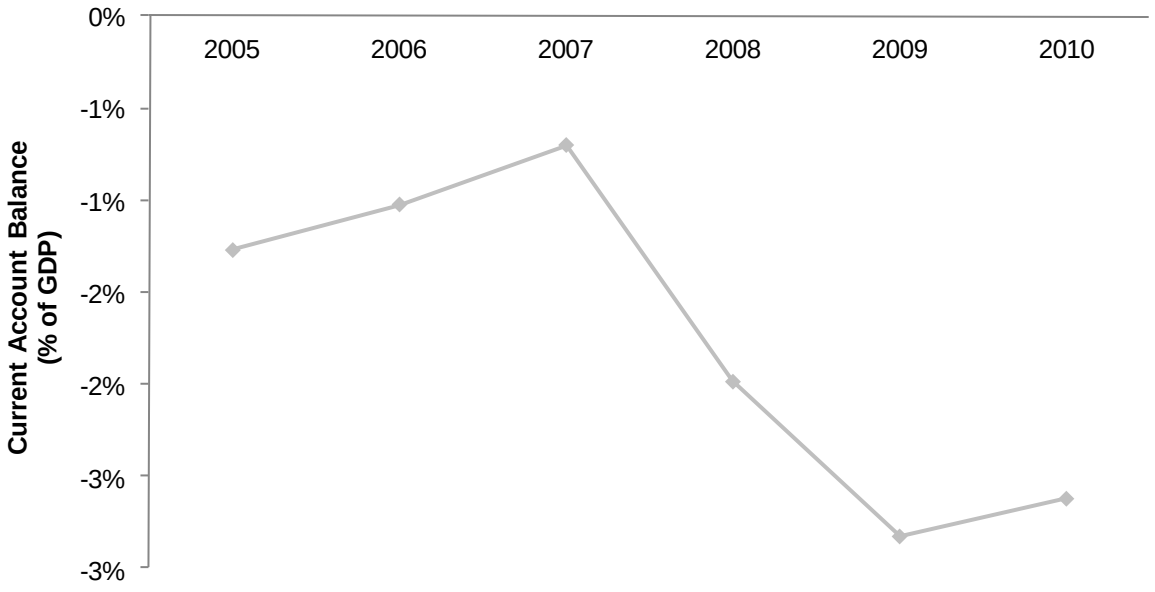


Source: ICD Research analysis

8.2.22 Trade balance as a percentage of GDP

The country has been registering a deficit in its current account balance since 2004, indicating that there were far more imports than exports in the country. The deficit widened in 2008, due to the economic recession, which led to decline in exports. Trade balance as a percentage of GDP stood at -1.3% in 2005, which declined to -2.6% in 2010. While the economy recovers, the country is expected to reduce the disproportion in the trade balance, by increasing exports.

Figure 71: Indian Trade Balance as a Percentage of GDP, 2005–2010

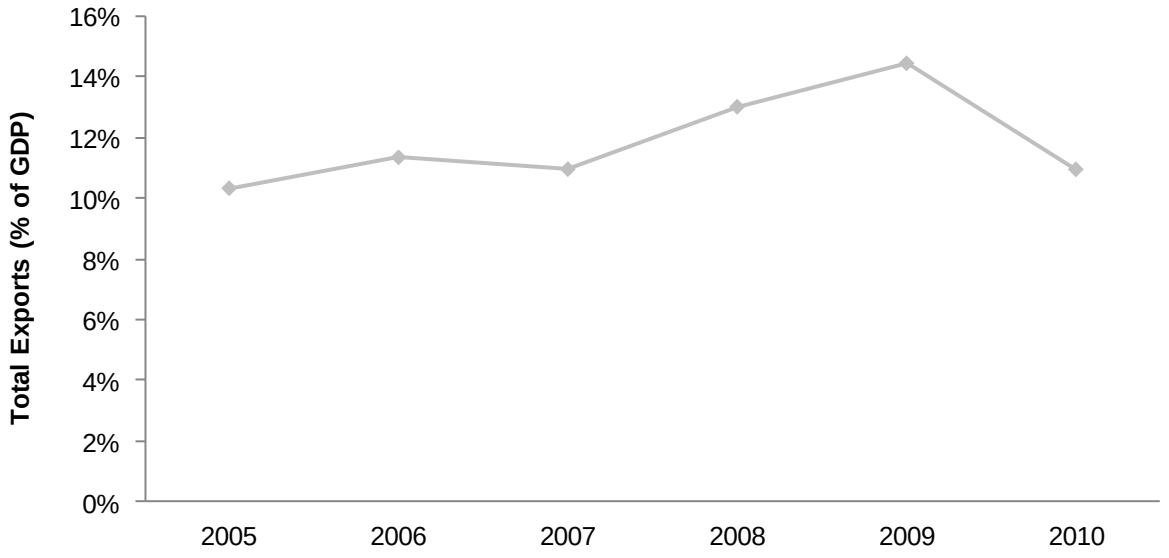


Source: ICD Research analysis

8.2.23 Exports as a percentage of GDP

Exports as a percentage of GDP were at their highest level of 14.5% in 2009. However, this declined to 10% in 2010, primarily due to the global economic slowdown.

Figure 72: Indian Exports as a Percentage of GDP, 2005–2010

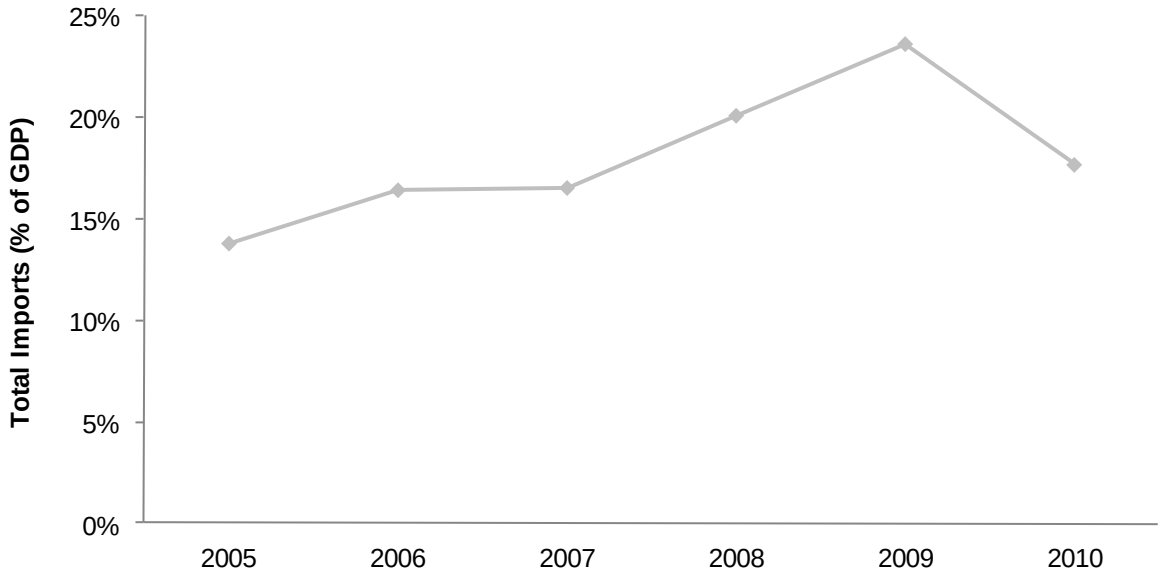


Source: ICD Research analysis

8.2.24 Imports as a percentage of GDP

Imports as a percentage of GDP were at their highest level of 23.6% in 2009. However, this declined to 17.7% in 2010, due to the global economic slowdown, as domestic demand for imported goods reduced.

Figure 73: Indian Imports as a Percentage of GDP, 2005–2010

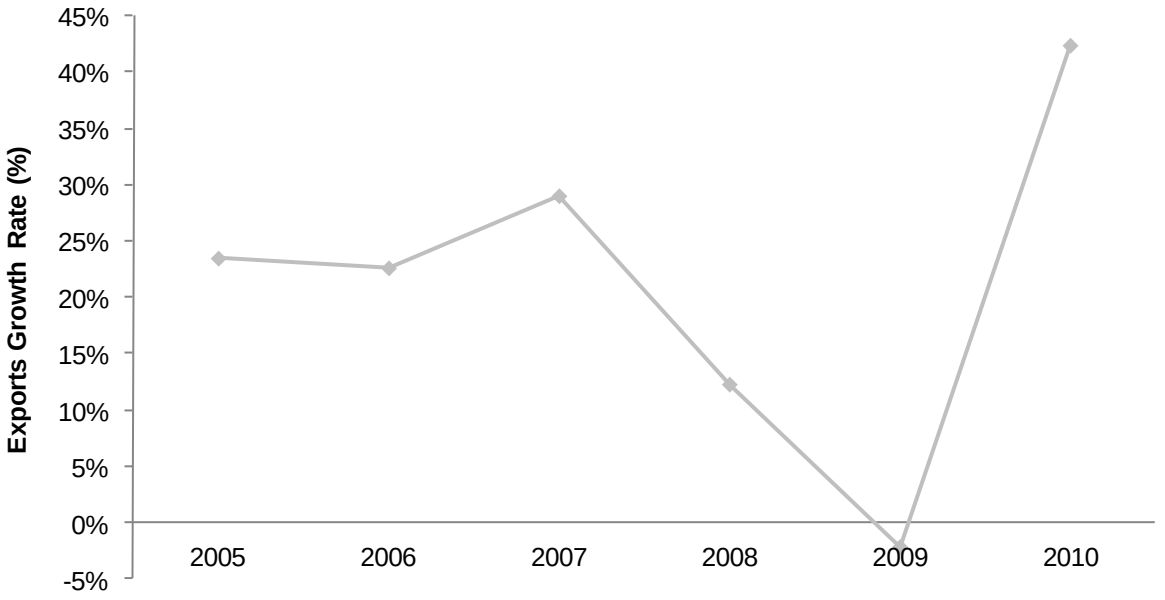


Source: ICD Research analysis

8.2.25 Exports growth

Exports growth was at its highest level in 2010, when it posted an annual increase of 42.3% compared to previous year when the growth rate was -2.2%.

Figure 74: Indian Exports Growth (%), 2005–2010

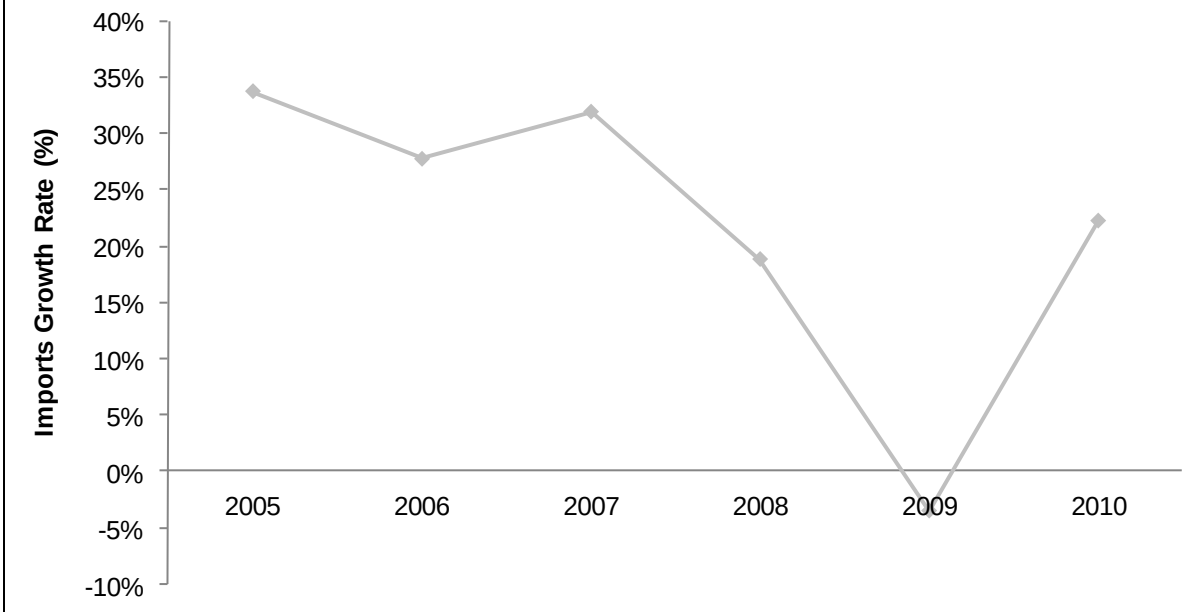


Source: ICD Research analysis

8.2.26 Imports growth

Imports growth reached its highest level of 33.8% in 2005. However, growth was negative in 2009, at -3.5%, before recovering to 22.3% by 2010.

Figure 75: Indian Imports Growth (%), 2005–2010

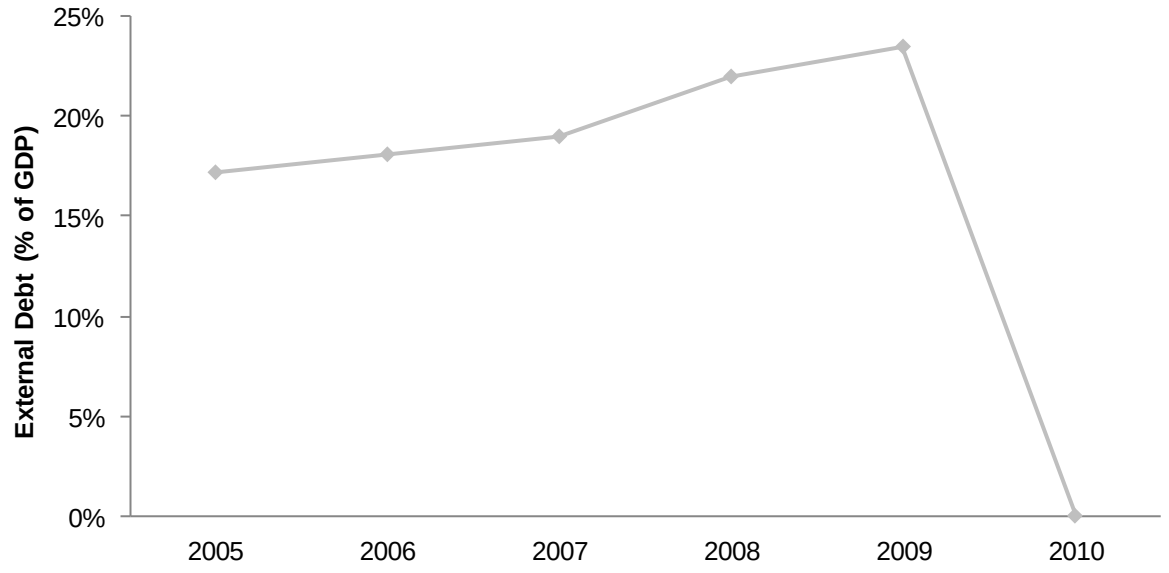


Source: ICD Research analysis

8.2.27 External debt as percentage of GDP

External debt as percentage of GDP was at 17.2% in 2005, which reduced to 0.0% in 2010.

Figure 76: Indian External Debt as a Percentage of GDP 2005–2010

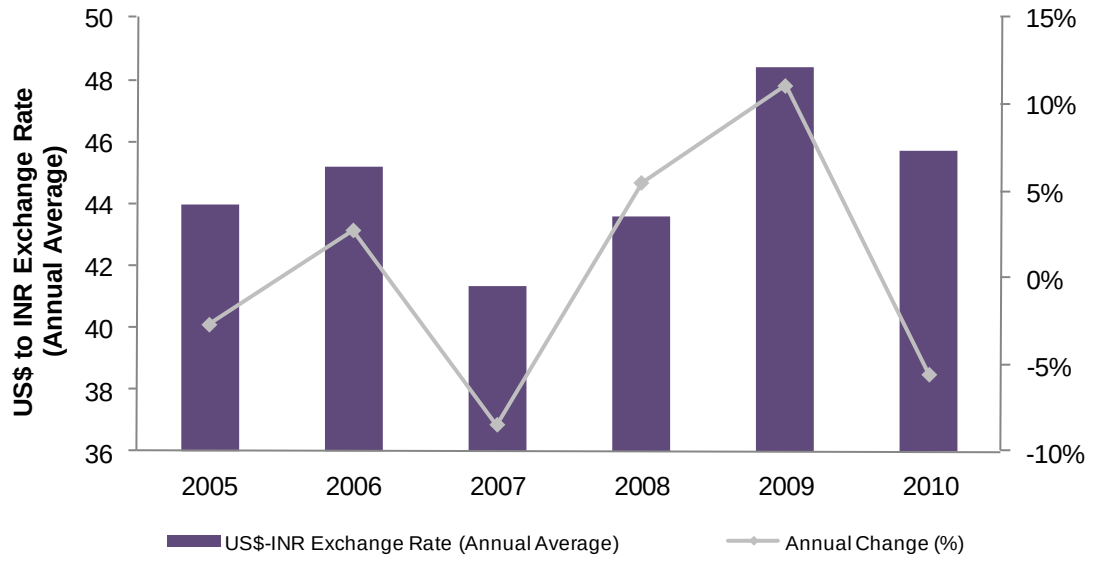


Source: ICD Research analysis

8.2.28 Exchange rate US$-INR (annual average)

The annual exchange rate was INR44.0 to the US dollar in 2005. However, this appreciated to INR41.3 in 2007 and depreciated to INR45.7 in 2010. The Indian rupee is expected to appreciate against the US dollar during the forecast period, supported by robust forecast economic growth.

Figure 77: Indian Exchange Rate US$-INR (Annual Average), 2005–2010

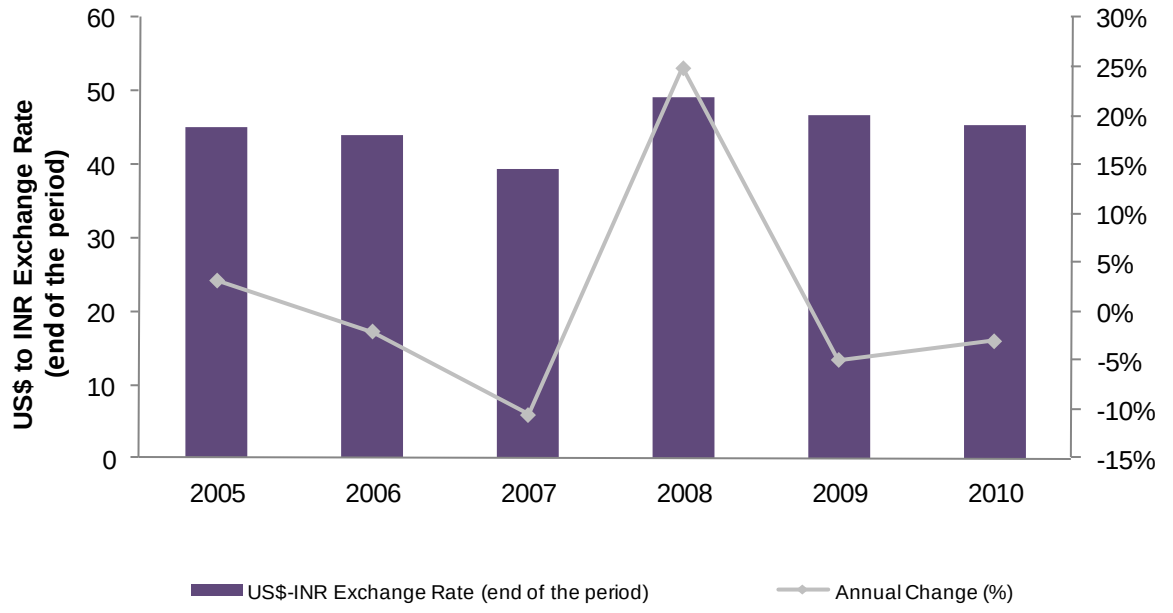


Source: ICD Research analysis

8.2.29 Exchange rate US$-INR (end of fiscal year)

The exchange rate at the end of the fiscal year was INR45.0 against the US dollar in 2005, before appreciating to INR39.4 in 2007 and later depreciating to INR45.3 in 2010. The Indian rupee is expected to appreciate against the US dollar during the forecast period, supported by robust forecast economic growth.

Figure 78: Indian Exchange Rate (End of Fiscal Year), 2005–2010

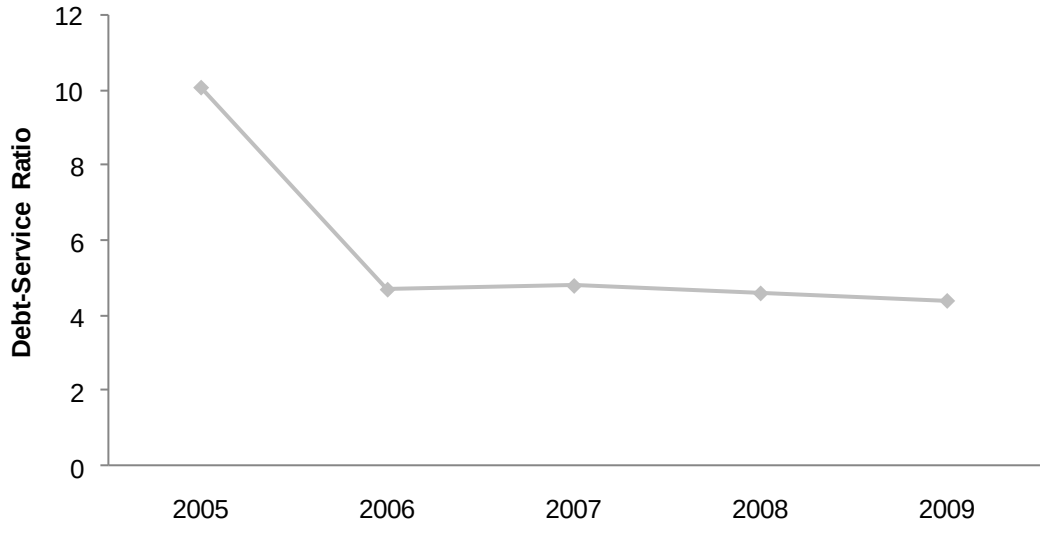


Source: ICD Research analysis

8.2.30 Debt service ratio

The debt service ratio was 10.1% in 2005, but declined to 4.4% in 2009.

Figure 79: Indian Debt Service Ratio, 2005–2009



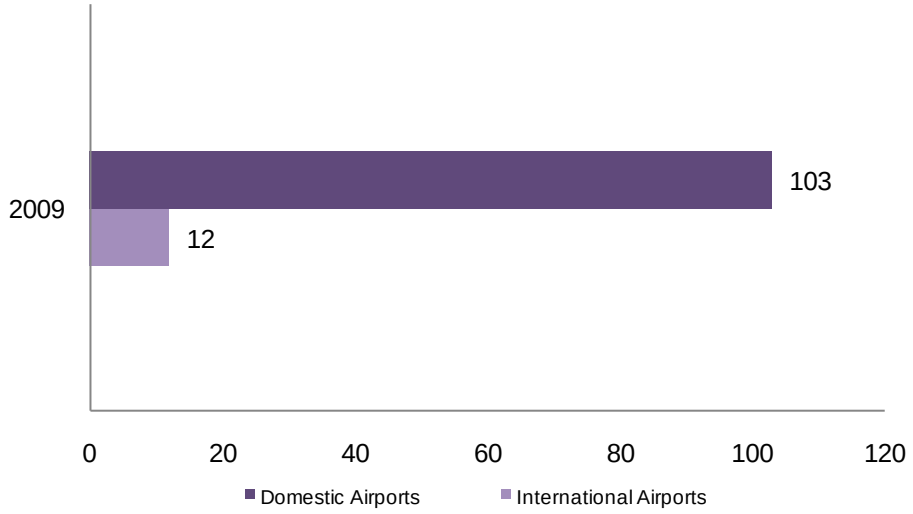
Source: ICD Research analysis

8.3 Infrastructure Quality and Availability

8.3.1 Transport – total airports

By the end of 2009, the total number of international airports in the country was 12, and the number of domestic airports was 103. The government has been focusing on the expansion of airports and the introduction of new runways, in order to handle the growing number of air passengers. As a result, the number of airports is projected to further increase during the forecast period. The country has 12 major ports and 187 minor ports as of 2009, which handle over 90% of the country's foreign maritime trade.

Figure 80: Indian Airports and Ports, 2009



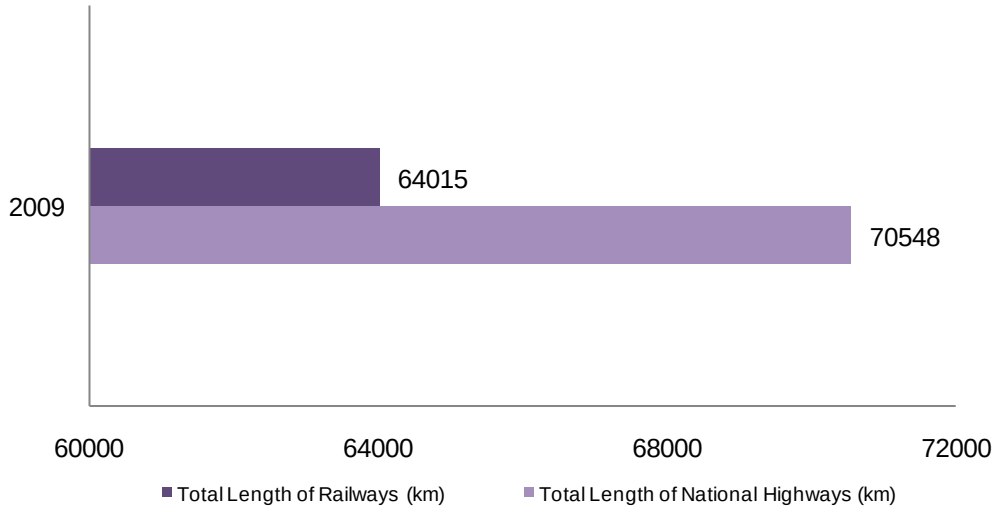
Source: ICD Research analysis

Note: Ports are classified by the volume of trade they handle. Major ports are under the jurisdiction of the central government and the minor ports are under the jurisdiction of the respective state government.

8.3.2 Transport – highways and railways

The total length of the India's highways was 70,548 kilometers in 2009, while its railway length was 64,015 kilometers. Rail and road transport is expected improve during the forecast period, as the government focuses on improving rail and road infrastructure.

Figure 81: Indian Total Land Transportation System, 2009

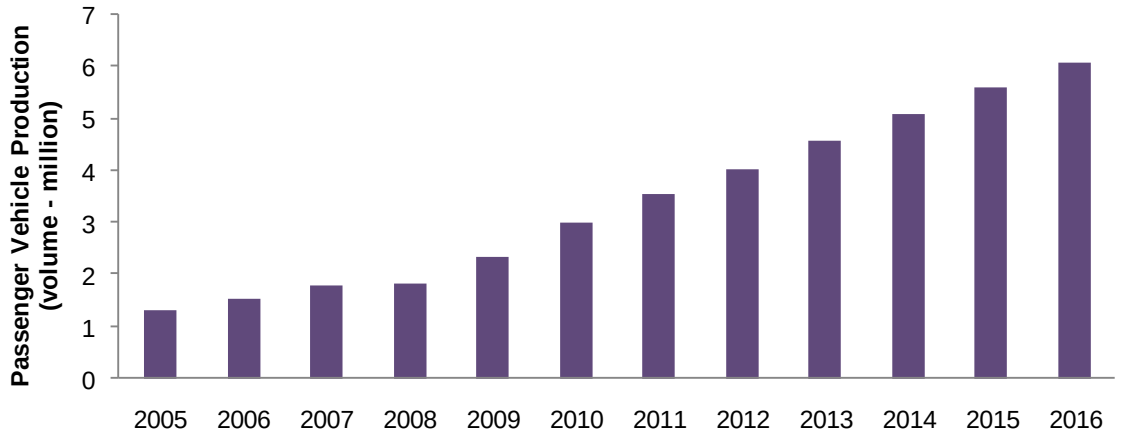


Source: ICD Research analysis

8.3.3 Transport – passenger vehicle production volume

Passenger vehicle production recorded a CAGR of 17.94% during the review period, and reached 3.0 million units in 2010. During the forecast period, production is forecast to grow at a CAGR of 13.42%, due to increased demand in the economy and increases in per-capita income. It is expected to reach 6.1 million units in 2016.

Figure 82: Indian Passenger Vehicle Production (Million), 2005–2016

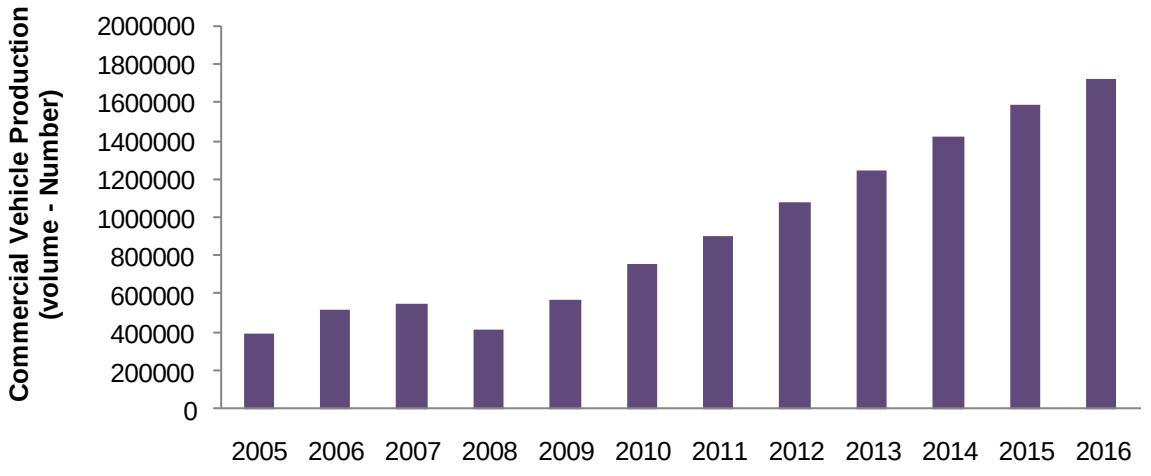


Source: ICD Research analysis

8.3.4 Transport – commercial vehicle production volume

Commercial vehicle production reached 752.7 thousand in 2010, having grown at a CAGR of 13.99% during the review period. Commercial vehicle production is forecast to register a CAGR of 16.06% during the forecast period, due to growth in GDP and rising income levels. It is expected to reach 1,718 thousand units by 2016.

Figure 83: Indian Commercial Vehicle Production, 2005–2016

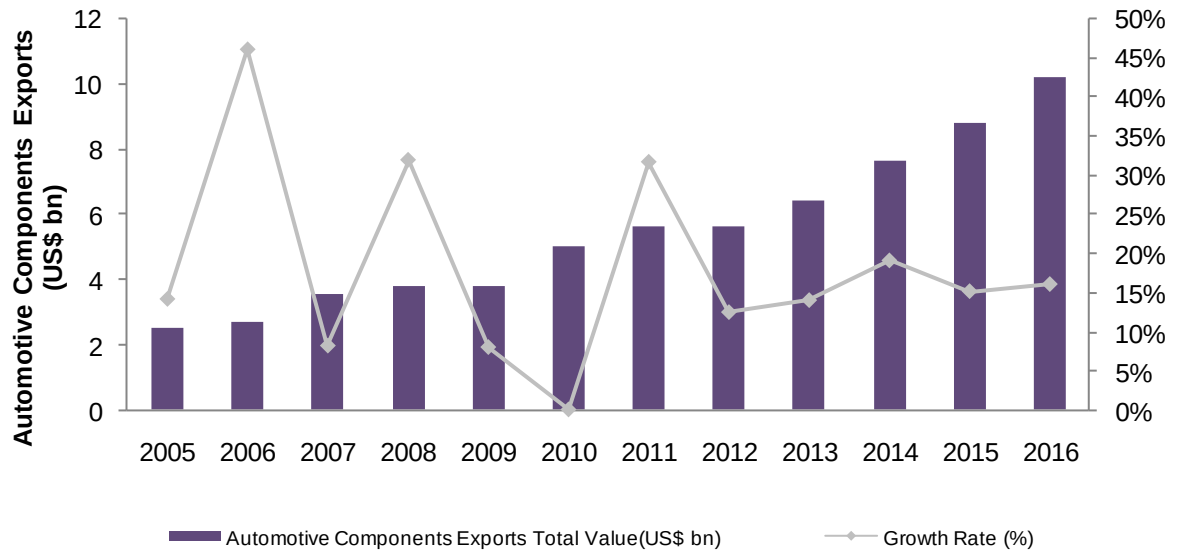


Source: ICD Research analysis

8.3.5 Transport – automotive components exports trend

Automotive components exports valued US$5.0 billion in 2010, recording a CAGR of 15.16% during the review period. Exports from this sector are expected to grow at a CAGR of 12.60% during the forecast period, due to recovery in the global economy. It is expected to reach US$10.2 billion by 2016.

Figure 84: Indian Automotive Components Exports (US$ Billion), 2005–2016

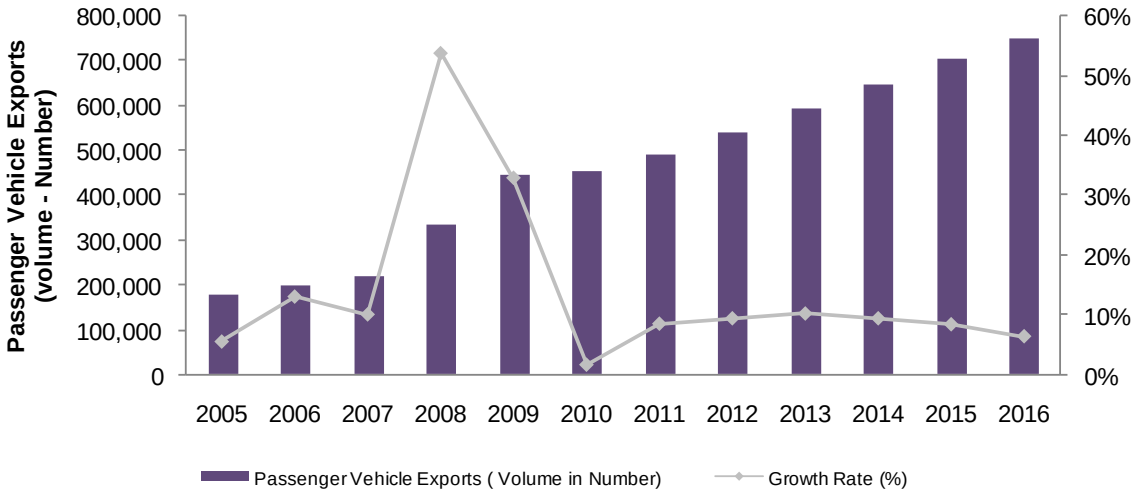


Source: ICD Research analysis

8.3.6 Transport – passenger vehicle export volume trend

Passenger vehicle export volume was 492 thousand units in 2010, having grown at a CAGR of 20.90% during the review period. Passenger vehicle export volume is expected to demonstrate robust growth due to recovery in the global economy, achieving a CAGR of 9.18% during the forecast period, to reach a volume of 748.5 thousand units by 2016.

Figure 85: Indian Passenger Vehicle Exports Volume, 2005–2016

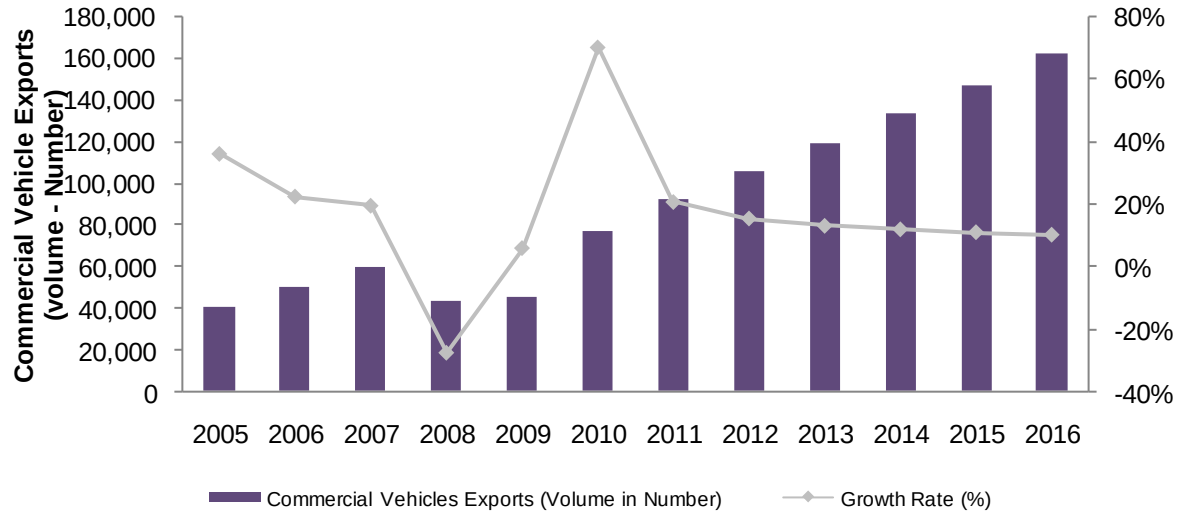


Source: ICD Research analysis

8.3.7 Transport – commercial vehicle export volume trend

Commercial vehicle export volume was 76.3 thousand units in 2010, having grown at a CAGR of 13.45% during the review period. Export volume is expected to grow at a CAGR of 13.99% during the forecast period, to reach 161.3 thousand by 2016.

Figure 86: Indian Commercial Vehicle Exports, 2005–2016

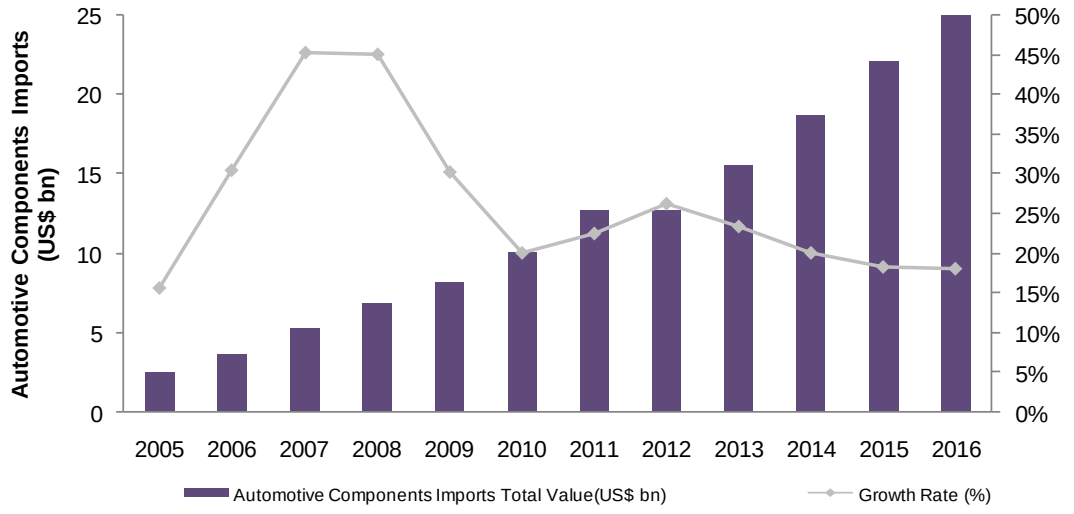


Source: ICD Research analysis

8.3.8 Transport – automotive products imports trend

Automotive products imports valued US$10.0 billion in 2010, having grown at a CAGR of 32.16% during the review period. This sector is expected to generate a CAGR of 17.15% during the forecast period, to reach US$26.0 billion in 2016.

Figure 87: Indian Automotive Components Imports (US$ Billion), 2005–2016

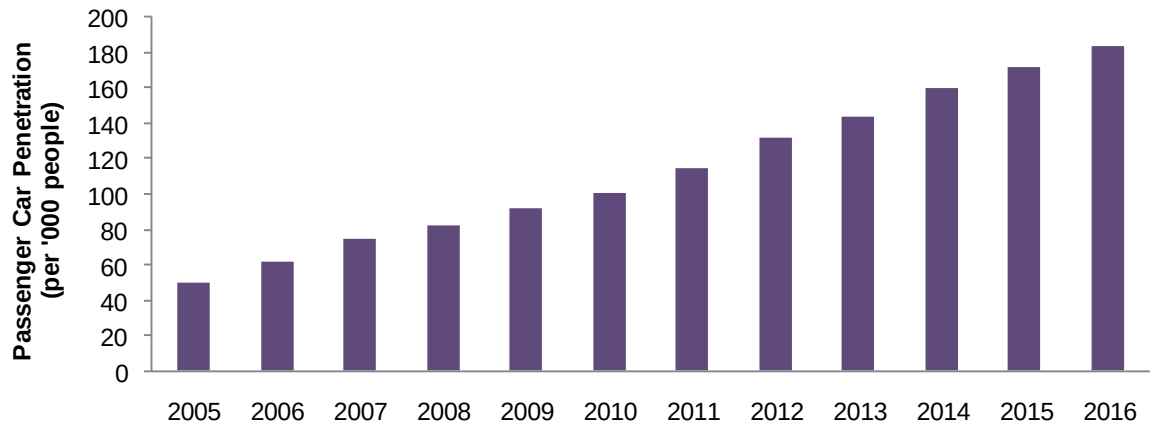


Source: ICD Research analysis

8.3.9 Transport – passenger car penetration

Passenger car penetration was at 101 cars per thousand people in 2010, recording a CAGR of 15.01% during the review period. This is projected to grow at a CAGR of 11.23% during the forecast period, to reach 184 cars per thousand people by 2016, due to an increasing per-capita income in the country and steady economic growth.

Figure 88: Indian Passenger Car Penetration (per Thousand People), 2005–2016

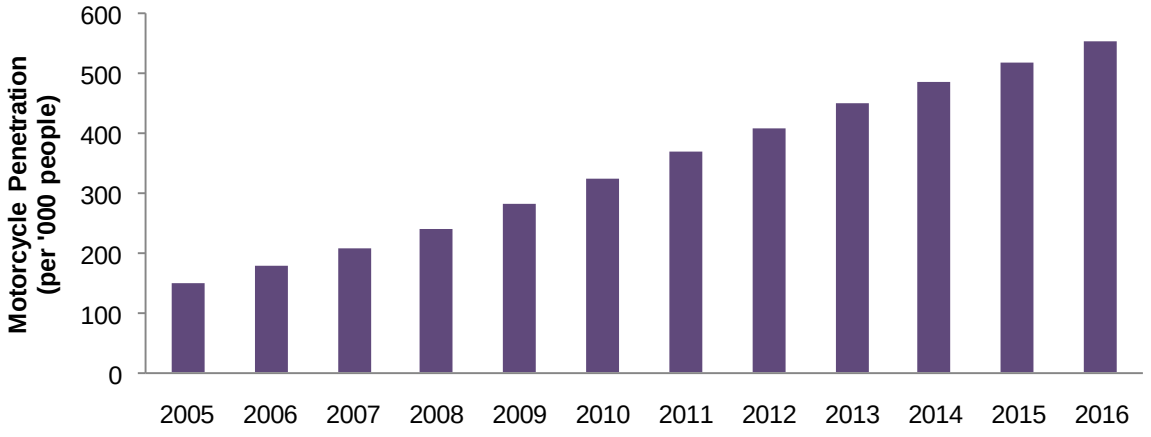


Source: ICD Research analysis

8.3.10 Transport – motorcycle penetration

Motorcycle penetration was at 325 motorcycles per thousand people in 2010, grown at a CAGR of 17.10% during the review period. This is projected to reach 555 motorcycles per thousand people by 2016, growing at a CAGR of 9.86% during the forecast period.

Figure 89: Indian Motorcycle Penetration (per Thousand People), 2005–2016

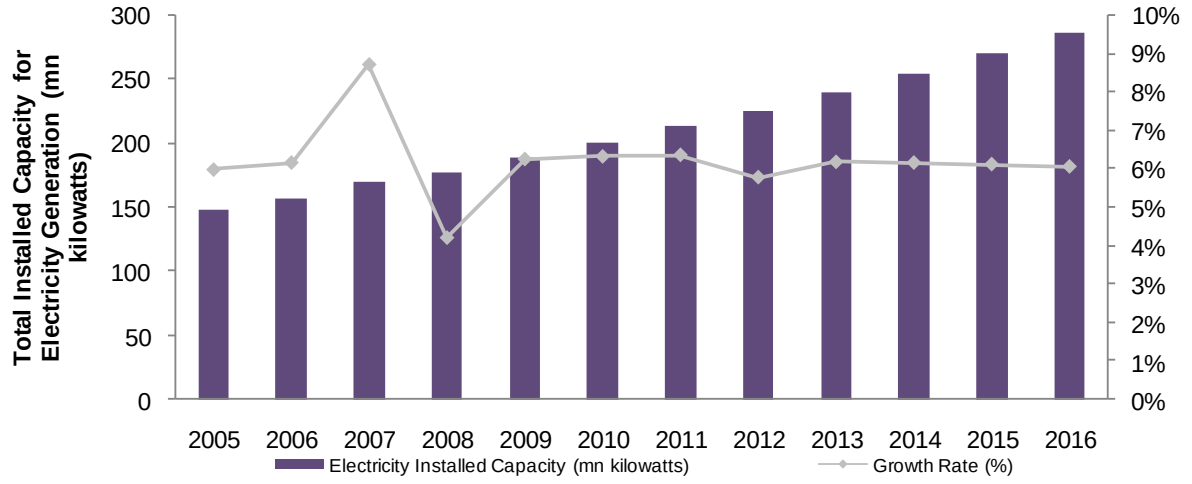


Source: ICD Research analysis

8.3.11 Utilities – total installed capacity for electricity generation

India's total installed electricity capacity was at 200.3 million kilowatts in 2010, having grown at a CAGR of 6.30% during the review period. This is projected to register a CAGR of 6.04% during the forecast period, to reach at 285.6 million kilowatts by 2016.

Figure 90: Indian Total Installed Capacity for Electricity Generation (Million Kilowatts), 2005–2016

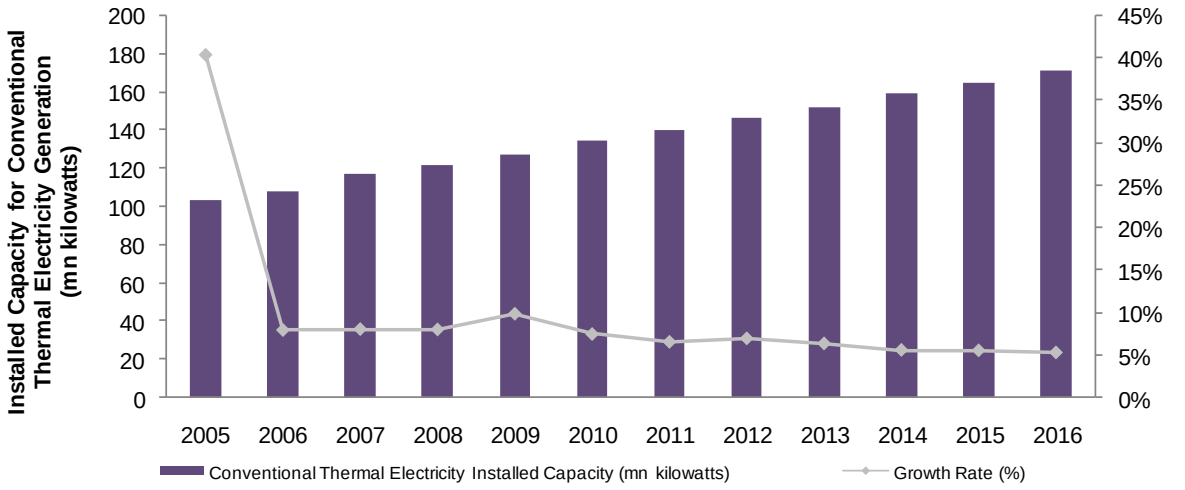


Source: ICD Research analysis

8.3.12 Utilities – installed capacity for conventional thermal electricity generation

Total installed conventional thermal electricity capacity reached 134.5 million kilowatts in 2010, having grown at CAGR of 5.33% during the review period. This is projected to increasing at a CAGR of 4.04% during the forecast period, to reach 171.5 million kilowatts by 2016.

Figure 91: Indian Installed Capacity for Conventional Thermal Electricity Generation (Million Kilowatts), 2005–2016



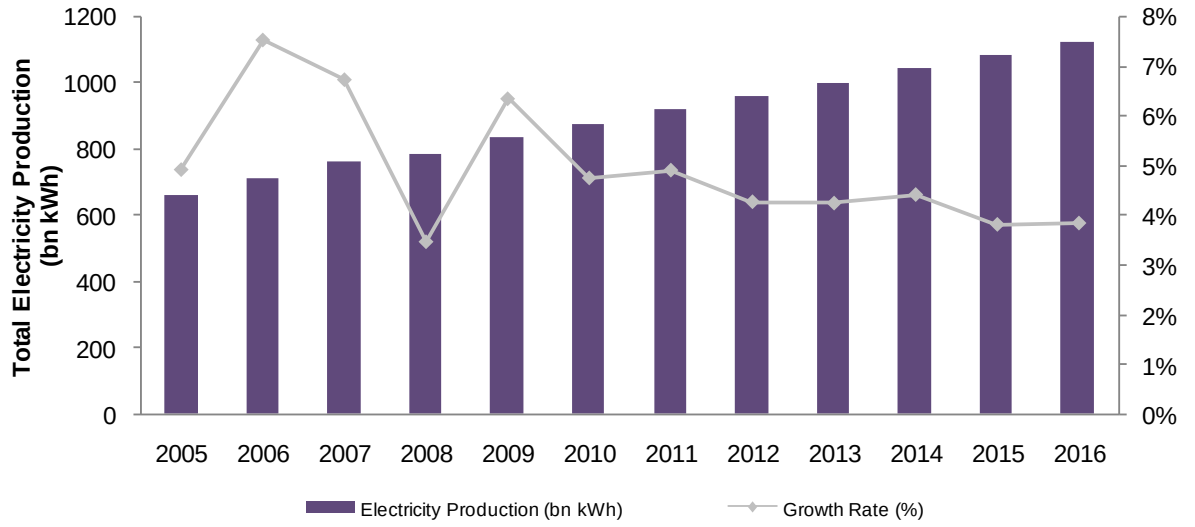
Source: ICD Research analysis

Published: November 2011

8.3.13 Utilities – electricity production

Electricity production reached 874.8 billion kilowatt hours in 2010, having grown at CAGR of 5.74% during the review period. Electricity production is projected to grow at a CAGR of 4.10% during the forecast period, to reach 1,121.9 billion kilowatt hours by 2016.

Figure 92: Indian Electricity Production (Billion Kilowatt Hours), 2005–2016

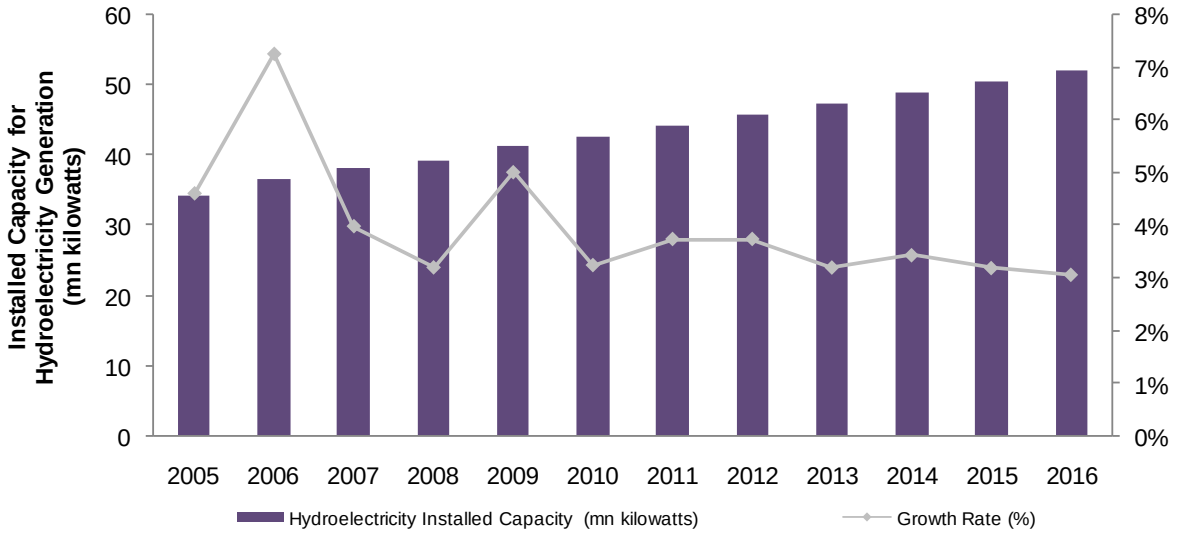


Source: ICD Research analysis

8.3.14 Utilities – installed capacity for hydroelectricity generation

The country's hydroelectricity installed capacity was 44.2 million kilowatts in 2010, having grown at CAGR of 4.53% during the review period. Installed capacity is projected to grow at a CAGR of 3.32% during the forecast period, to reach 52.1 million kilowatts by 2016.

Figure 93: Indian Installed Capacity for Hydroelectricity Generation (Million Kilowatts), 2005–2016

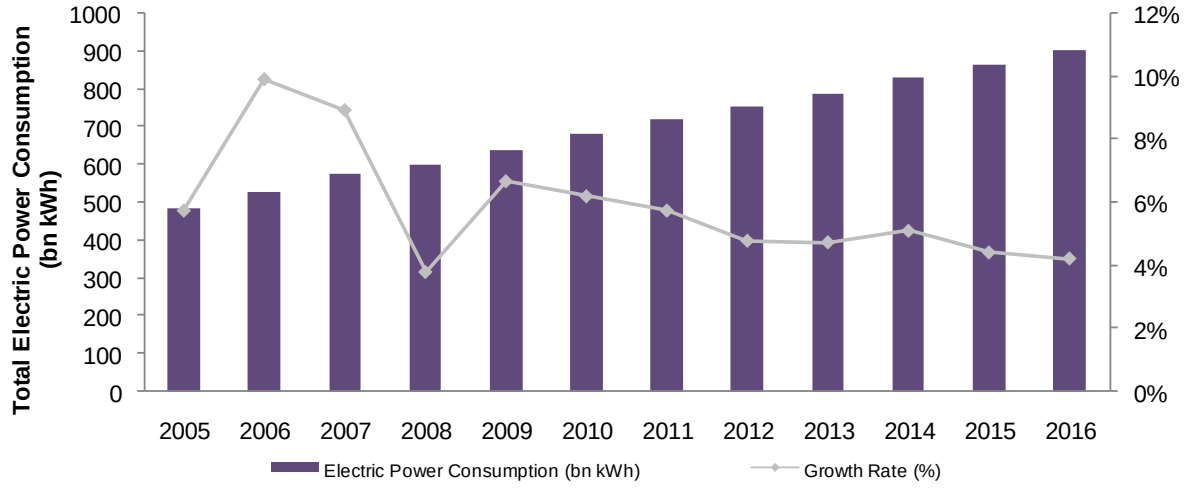


Source: ICD Research analysis

8.3.15 Utilities – electric power consumption

Electricity power consumption reached 680.4 billion kilowatt hours in 2010, having grown at CAGR of 7.08% during the review period. It is projected to register a CAGR of 4.64% during the forecast period, to reach 902.7 billion kilowatt hours by 2016. Future growth in electric power consumption will be primarily driven by growth in the manufacturing sector and the electric power consumption in the country's households increase.

Figure 94: Indian Electric Power Consumption (Billion Kilowatt Hours), 2005–2016

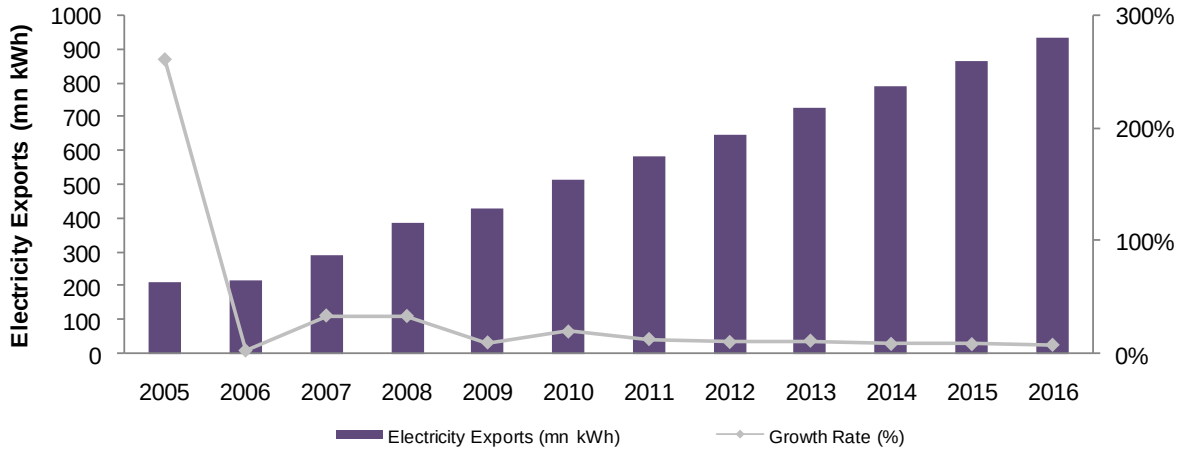


Source: ICD Research analysis

8.3.16 Utilities – electricity exports

Electricity exports reach 541.5 million kilowatt hours in 2010, having grown at CAGR of 19.74% during the review period. Growth in electricity power exports is expected to achieve a CAGR of 9.84% during the forecast period, to reach 933.3 million kilowatt hours by 2016.

Figure 95: Indian Electricity Exports (Million Kilowatt Hours), 2005–2016

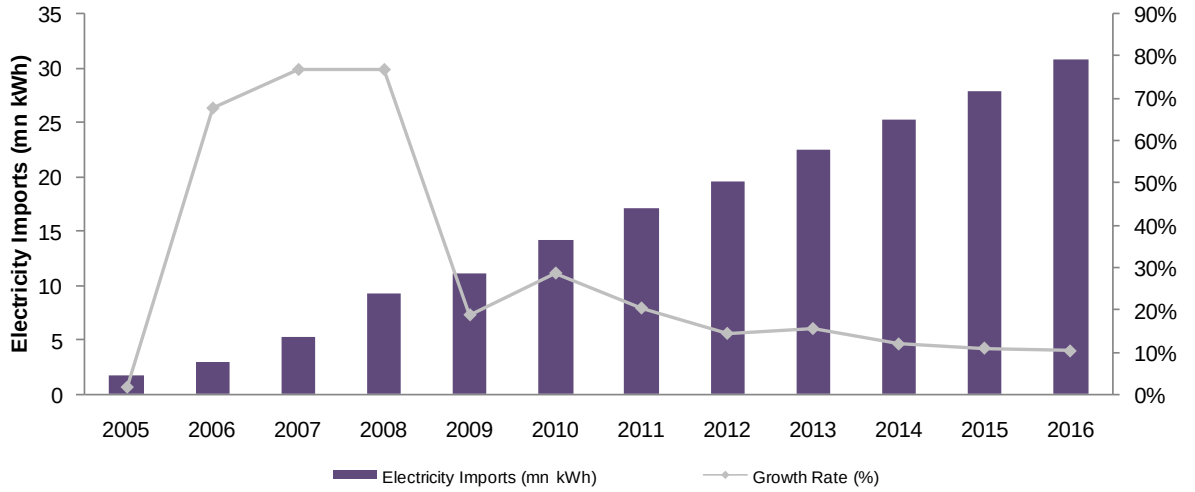


Source: ICD Research analysis

8.3.17 Utilities – electricity imports

Electricity imports reached 14.1 million kilowatt hours in 2010, having grown at CAGR of 51.62% during the review period. Growth in electricity imports is expected to achieve a CAGR of 12.52% during the forecast period, to reach 30.7 million kilowatt hours by 2016.

Figure 96: Indian Electricity Imports (Million Kilowatt Hours), 2005–2016

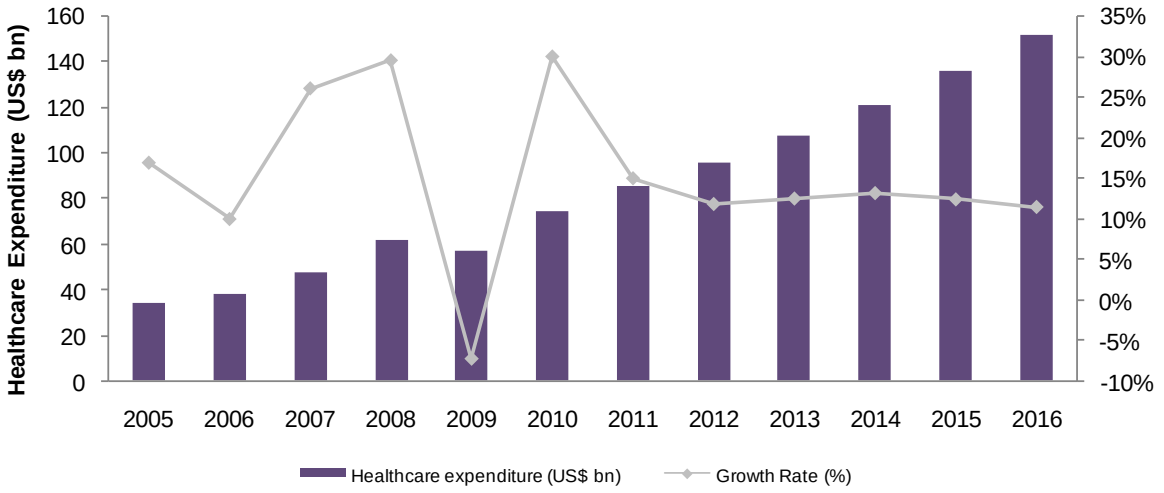


Source: ICD Research analysis

8.3.18 Healthcare – healthcare expenditure

Healthcare expenditure in India reached US$73.9 billion in 2010, having grown at CAGR of 16.66% during the review period. Growth in healthcare expenditure is expected at a CAGR of 12.24% during the forecast period, to reach US$151.3 billion by 2016. This growth will be driven by a rise in lifestyle-related diseases. To meet the growing demand, the government will be investing significant amounts of money to increase the infrastructure used for providing cost effective healthcare.

Figure 97: Indian Healthcare Expenditure (US$ Billion), 2005–2016

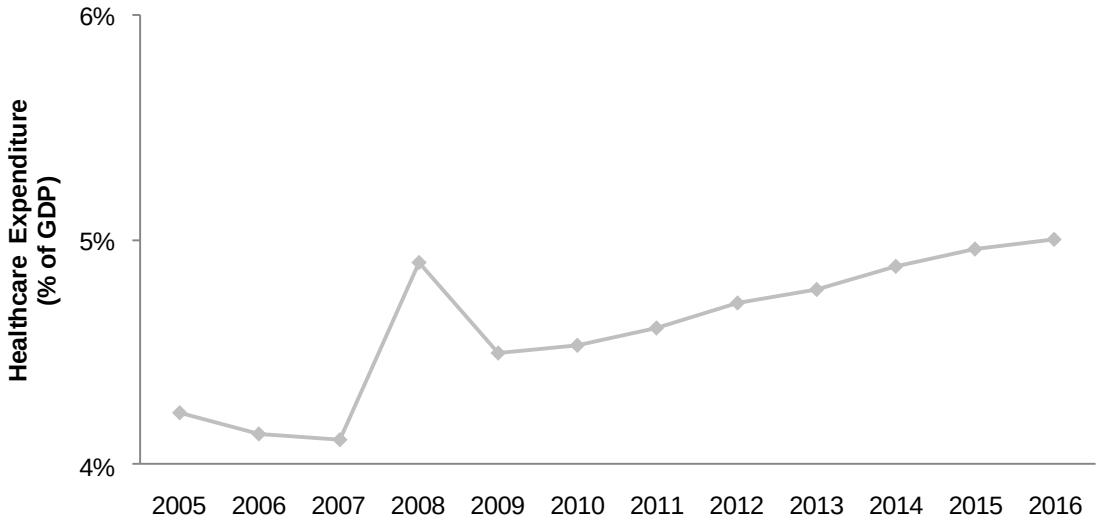


Source: ICD Research analysis

8.3.19 Healthcare – healthcare expenditure as a percentage of GDP

Healthcare expenditure as a percentage of GDP was 4.2% in 2010, and demonstrated slight growth to reach 4.5% in 2010. It is expected to reach 5.0% by 2016.

Figure 98: Indian Healthcare Expenditure as a Percentage of GDP, 2005–2016

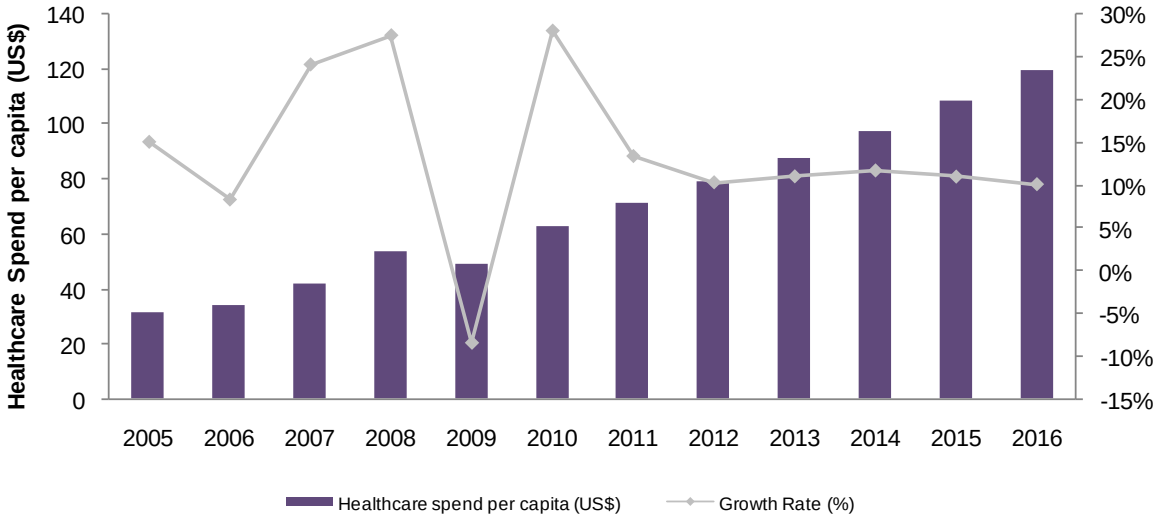


Source: ICD Research analysis

8.3.20 Healthcare – healthcare expenditure per capita

Healthcare expenditure per capita was US$63.0 in 2010, having grown at CAGR of 14.98% during the review period. Growth in healthcare expenditure is expected to achieve a CAGR of 10.82% during the forecast period, to reach US$119.5 by 2016.

Figure 99: Indian Per-Capita Healthcare Expenditure, 2005–2016

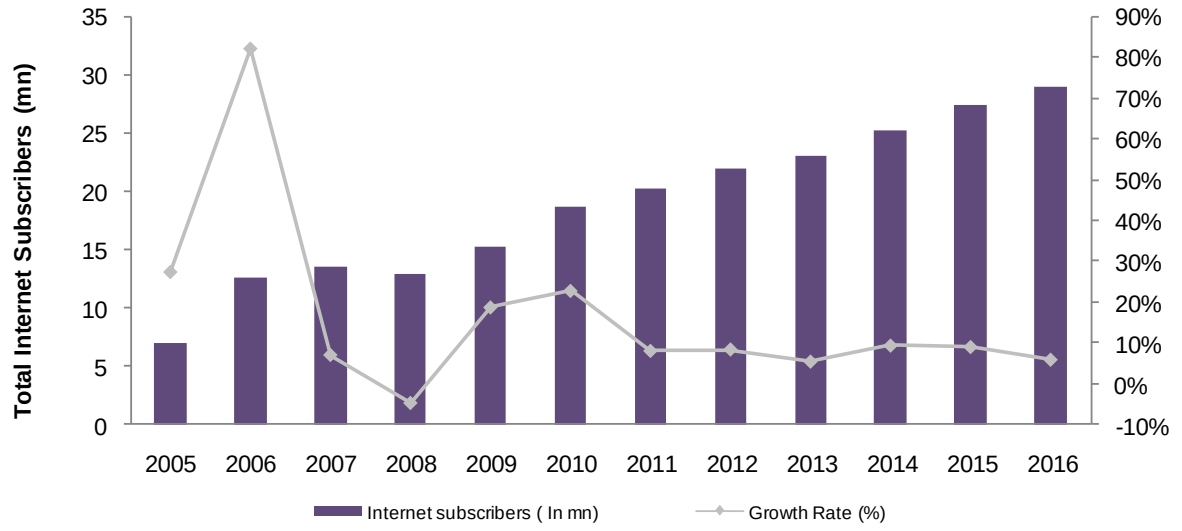


Source: ICD Research analysis

8.3.21 Communication – total number of internet subscribers

The total number of internet subscribers was 18.7 million in 2010, having grown at CAGR of 23.82% during the review period. This number of internet subscribers is expected to grow at a CAGR of 7.53% during the forecast period, to reach 29 million by 2016. The rise in the number of internet subscribers is largely attributed to the increased availability of affordable PCs and improved infrastructure for data transmission.

Figure 100: Indian Internet Subscribers, 2005–2016

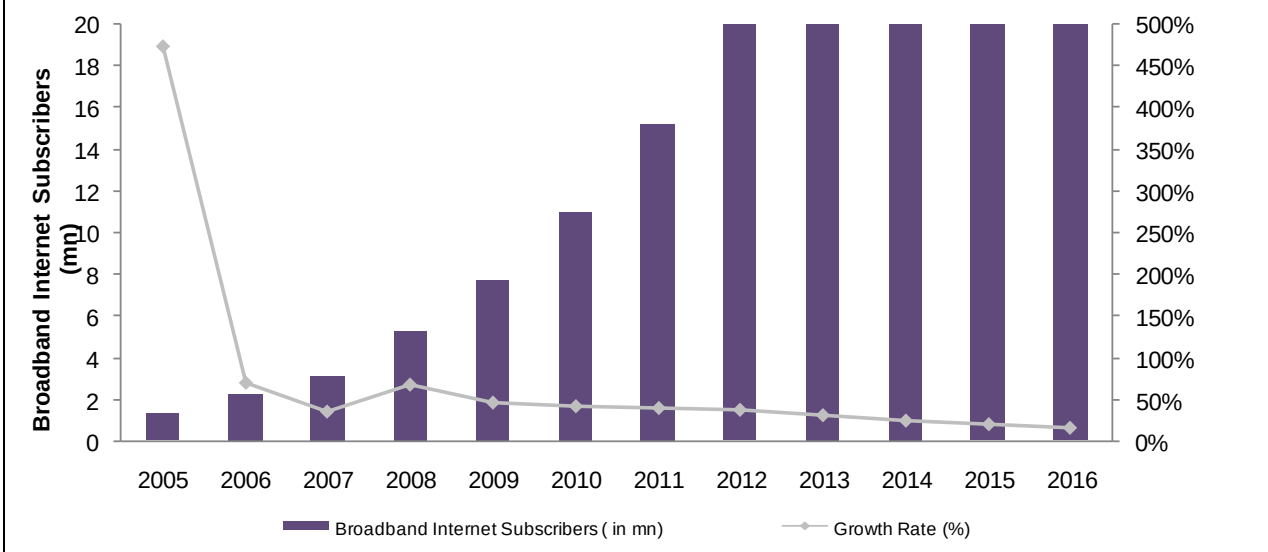


Source: ICD Research analysis

8.3.22 Communication – number of broadband internet subscribers

The number of broadband internet subscribers was 11.0 million in 2010, having grown at a CAGR of 62.48% during the review period. Growth in the number of broadband internet subscribers is projected to achieve a CAGR of 25.66% during the forecast period, to reach 47.8 million users by 2016.

Figure 101: Indian Broadband Internet Subscribers (Million), 2005–2016

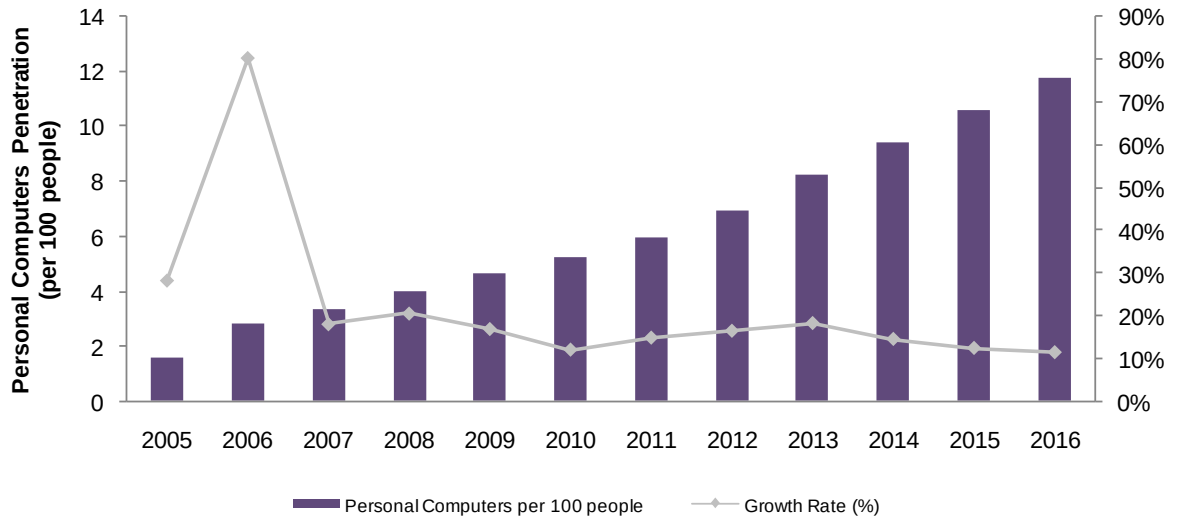


Source: ICD Research analysis

8.3.23 Communication – personal computer penetration

Personal computer penetration reached 5.2 computers per hundred people in 2010, having grown at a CAGR of 30.86% during the review period. Growth in personal computer penetration is expected to achieve a CAGR of 14.55% during the forecast period, to reach 11.7 computers per hundred people by 2016. This growth is largely due to growth in the service sector and the enhanced computer awareness that has been created through the education system.

Figure 102: Indian Personal Computer Penetration (per Hundred People), 2005–2016

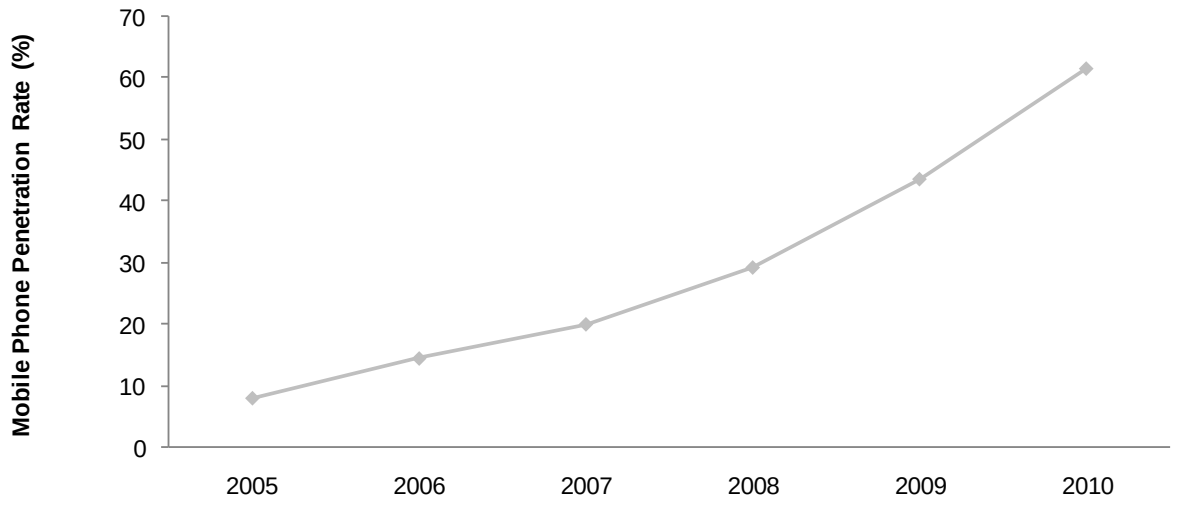


Source: ICD Research analysis

8.3.24 Communication – mobile phone penetration rate

The mobile phone penetration rate in the country was 7.91 in 2005, which grew to 61.42 by 2010.

Figure 103: Indian Mobile Phone Penetration (%), 2005–2010

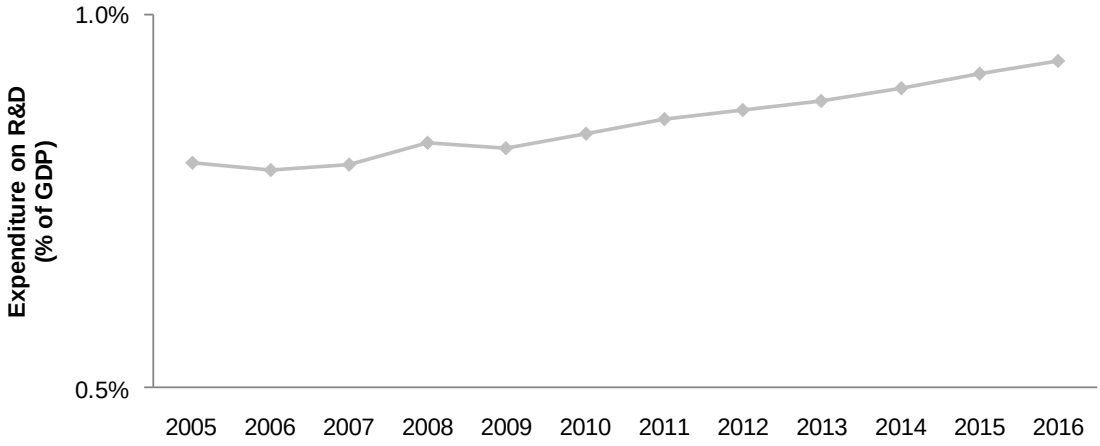


Source: ICD Research analysis

8.3.25 Technology – research and development expenditure as a percentage of GDP

The country's research and development (R&D) as a percentage of GDP was 0.8% in 2010. This is unlikely to change significantly during the forecast period, and is forecast to rise slightly to 0.9% by 2016.

Figure 104: Indian R&D Expenditure as a Percentage of GDP, 2005–2016



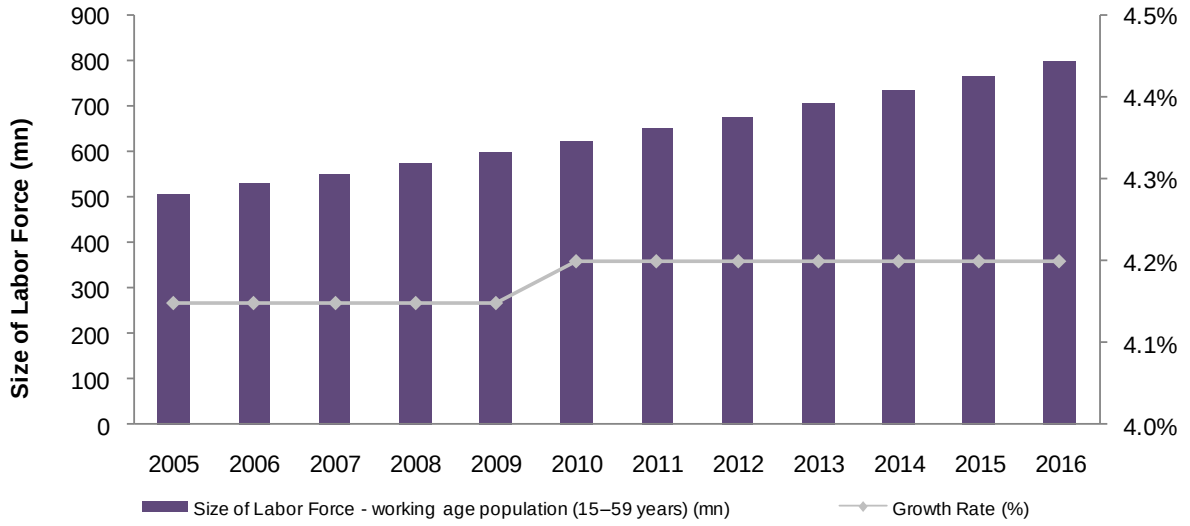
Source: ICD Research analysis

8.4 Labor Force

8.4.1 Labor force

The Indian labor force count, which consists of the amount of people aged 15–59, stood at 622.7 million in 2010, having grown at a CAGR of 4.16% during the review period. In the forecast period, the labor force is projected to grow at a CAGR of 4.20%, to reach 797 million in 2016.

Figure 105: Indian Size of Labor Force (Million), 2005–2016

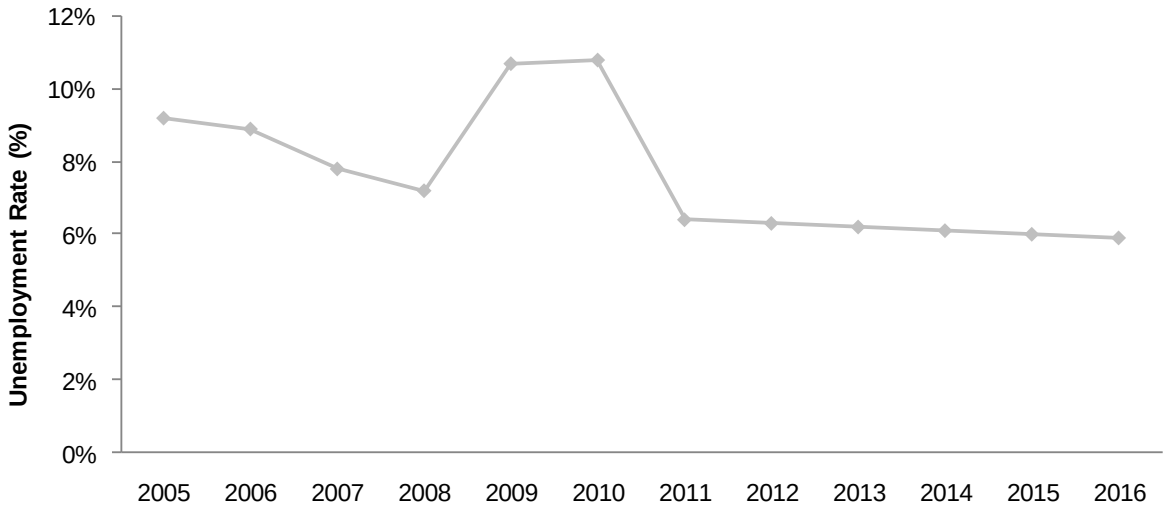


Source: Indexmundi and ICD Research analysis

8.4.2 Unemployment rate

India's strong economic growth has led to a steady decline in the unemployment rate, until 2008 when the economic recession led to the unemployment rate increasing. As a result of these factors, the unemployment rate increased from 9.2% in 2005 to 10.8% in 2010. Unemployment is expected to fall during the forecast period, and reach 6.2% in 2016.

Figure 106: Indian Unemployment Rate (%), 2005–2016



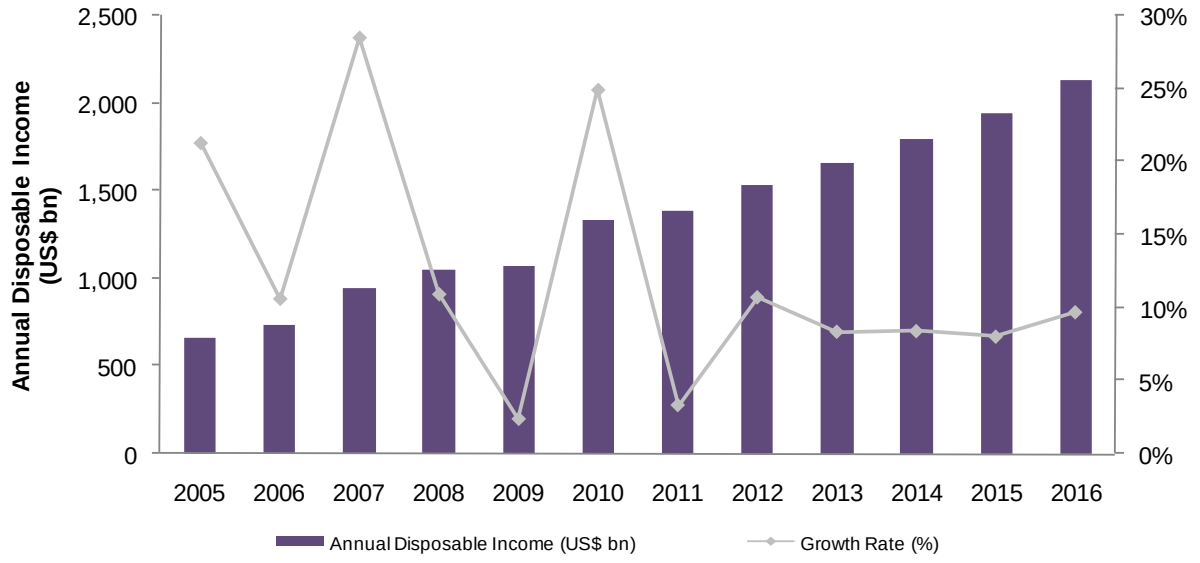
Source: Indian Economic Survey and ICD Research analysis

8.5 Demographics

8.5.1 Annual disposable income

In 2010, the country's annual disposable income reached US$1,383.2 billion, having grown at a CAGR of 15.08% during the review period. Growth in annual disposable income is expected to achieve a CAGR of 9.04% during the forecast period, to reach US$2,132.6 billion by 2016.

Figure 107: Indian Annual Disposable Income (US$ Billion), 2005–2016

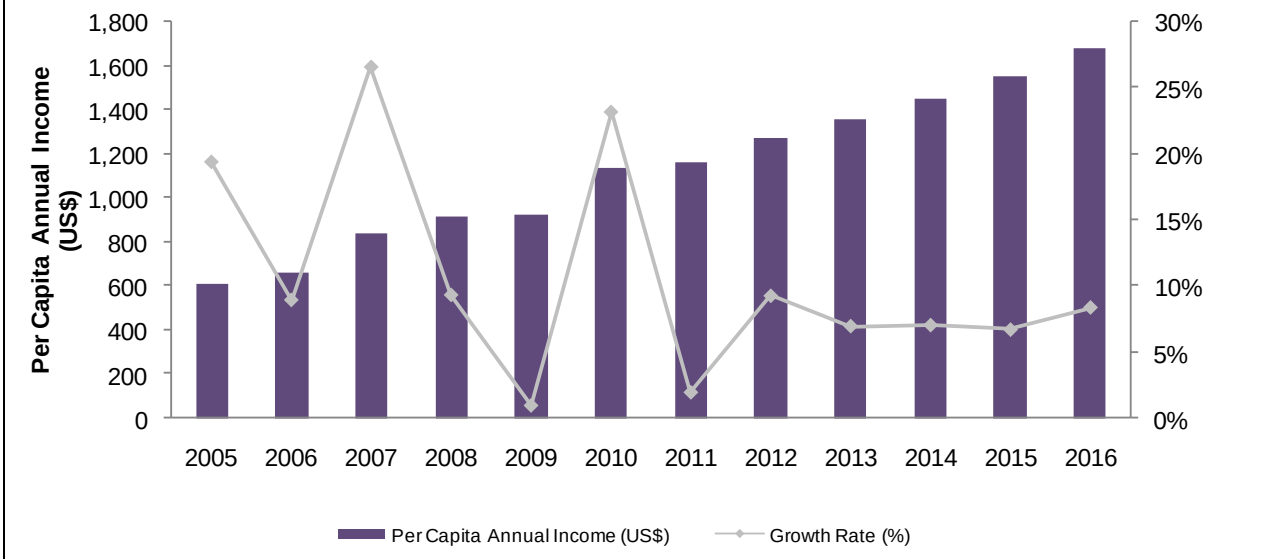


Source: Ministry of Statistics India and ICD Research analysis

8.5.2 Annual per-capita disposable income

India's annual per-capita disposable income valued US$1,140.9 in 2010, having grown at a CAGR of 13.42% during the review period. Growth in per-capital annual disposable income is expected to register a CAGR of 7.67% during the forecast period, to reach US$1,683.3 in 2016.

Figure 108: Indian Annual Per Capita Disposable Income (US$), 2005–2016

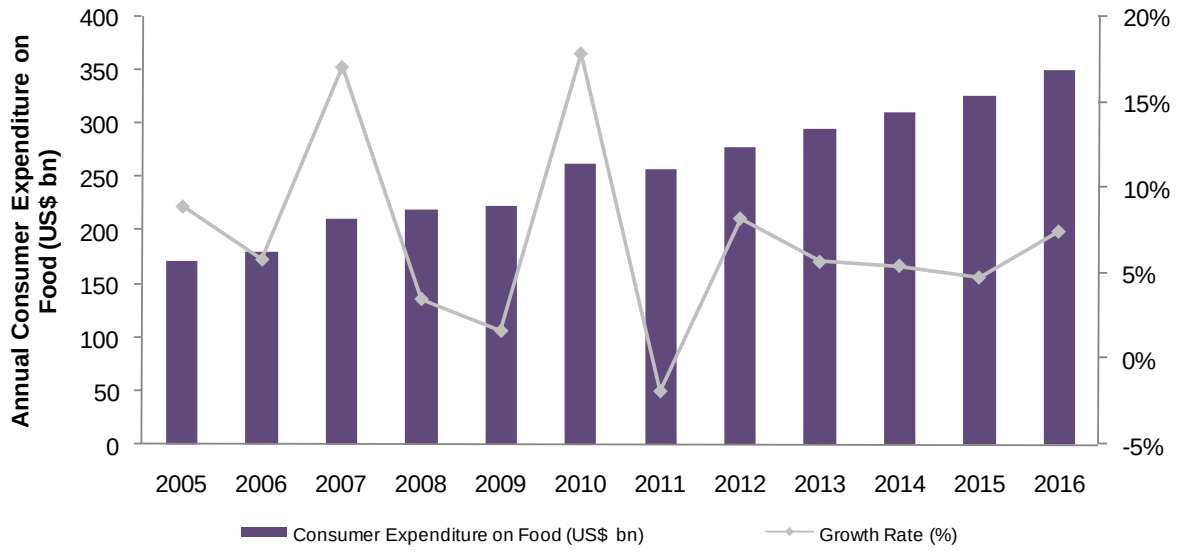


Source: Ministry of Statistics India and ICD Research analysis

8.5.3 Annual consumer expenditure on food

Annual consumer expenditure on food valued US$262.5 billion in 2010, having grown at a CAGR of 8.97% during the review period. Annual expenditure on food is expected to grow at a CAGR of 6.31% during the forecast period, to reach US$349.9 billion in 2016.

Figure 109: Indian Consumer Expenditure on Food (US$ Billion), 2005–2016

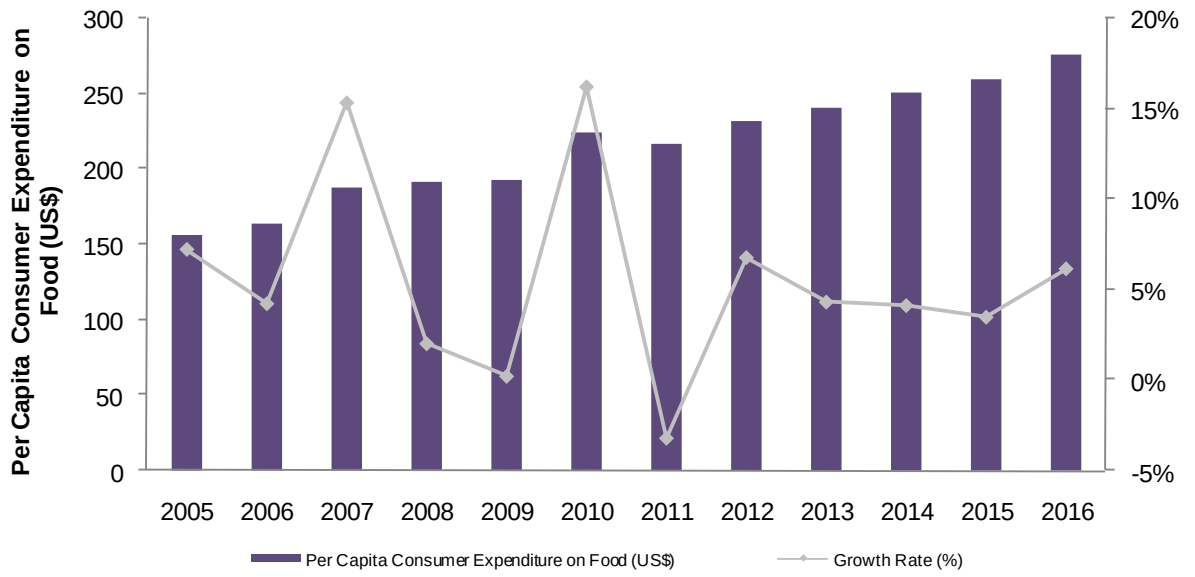


Source: Ministry of Statistics India and ICD Research analysis

8.5.4 Annual per-capita consumer expenditure on food

Annual per-capita consumer expenditure on food was US$223.8 in 2010, having grown at a CAGR of 7.40% during the review period. Annual per-capita consumer expenditure on food is expected to grow at a CAGR of 4.98% during the forecast period, to reach US$276.2 by 2016.

Figure 110: Indian Annual Per-Capita Consumer Expenditure on Food (US$), 2005–2016

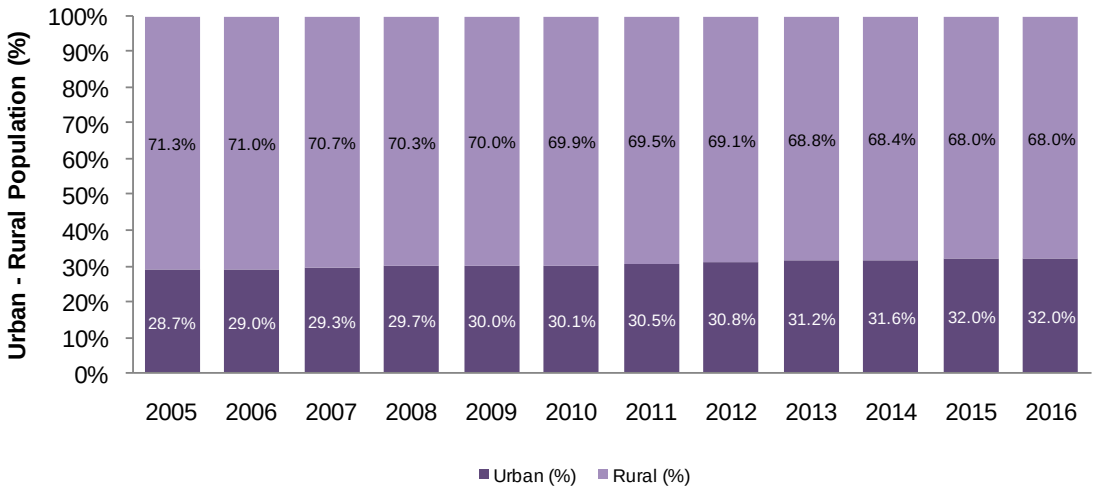


Source: Ministry of Statistics India and ICD Research analysis

8.5.5 Urban and rural population

The rural population decreased from 71.3% of the total population in 2005, to 69.9% of the total population in 2010. It is expected to fall to 68% of total population by 2016. The rise in the urban population is mainly due to the higher income level and attractive lifestyle of the country's urban population.

Figure 111: Indian Urban and Rural Population (%), 2005–2016

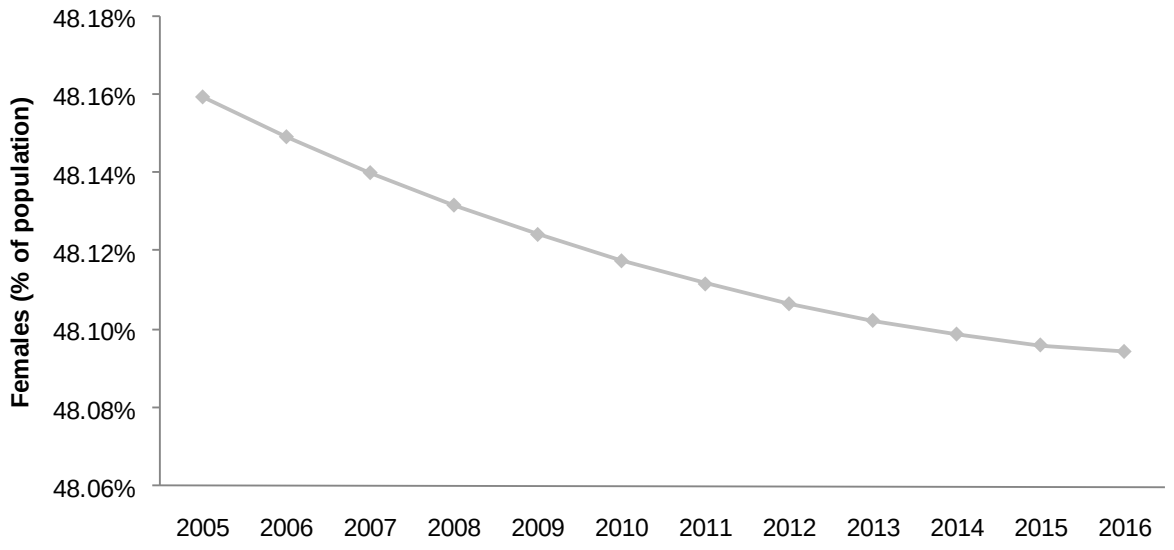


Source: Census India and ICD Research analysis

8.5.6 Females as a percentage of population

The percentage of female population was 48.12% in 2010 compared to 48.16% in 2005. The percentage of female population is expected to be 48.10% in 2016.

Figure 112: Indian Female as a Percentage of Population, 2005–2016

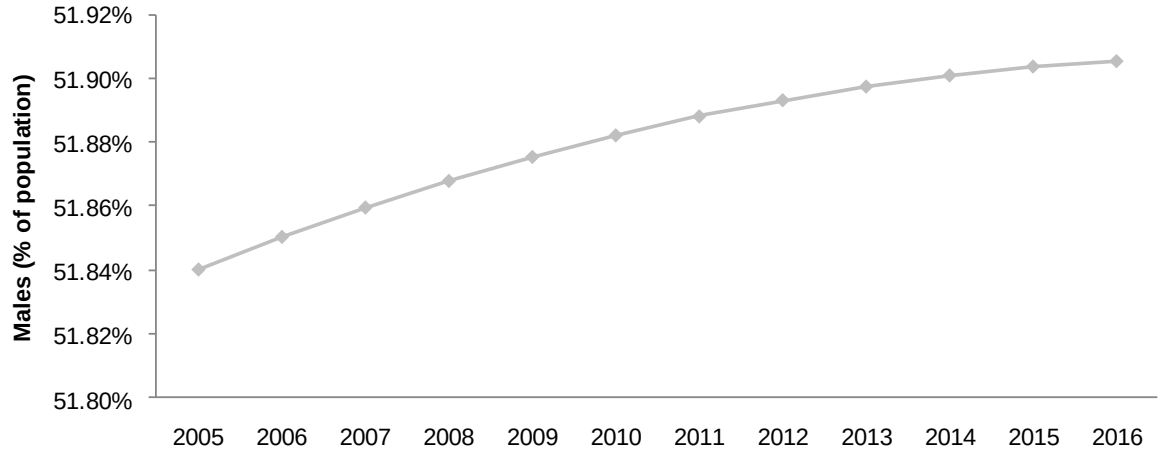


Source: ICD Research analysis

8.5.7 Males as a percentage of the population

The percentage of male population was 51.9% in 2010 compared to 51.8% in 2005. The percentage of males in the population is expected to reach 51.90% in 2016.

Figure 113: Indian Males as a Percentage of Population, 2005–2016

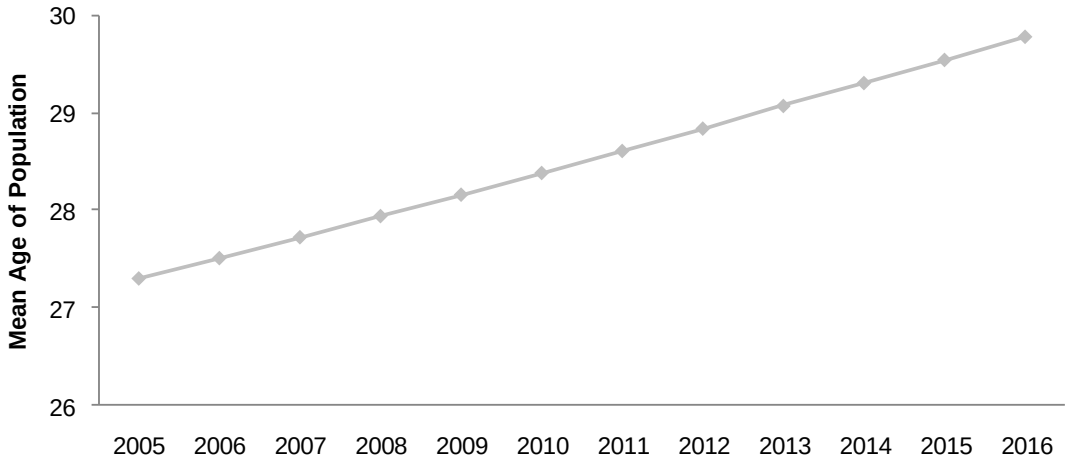


Source: ICD Research analysis

8.5.8 Mean age of population

The mean population age of India was 28.4 years in 2010, as compared to 27.3 years in 2005. It is expected to remain below 30 years during the forecast period.

Figure 114: Indian Mean Age of Population, 2005–2016

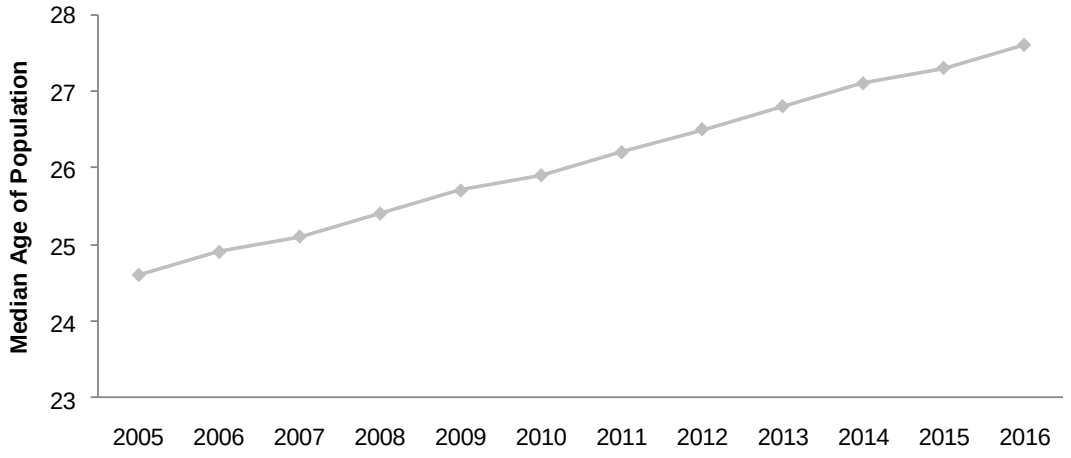


Source: ICD Research analysis

8.5.9 Median age of population

The median age of the population was 25.9 years in 2010, as compared to 24.6 years in 2005. It is expected to reach 27.6 years by 2016

Figure 115: Indian Median Age of Population, 2005–2016

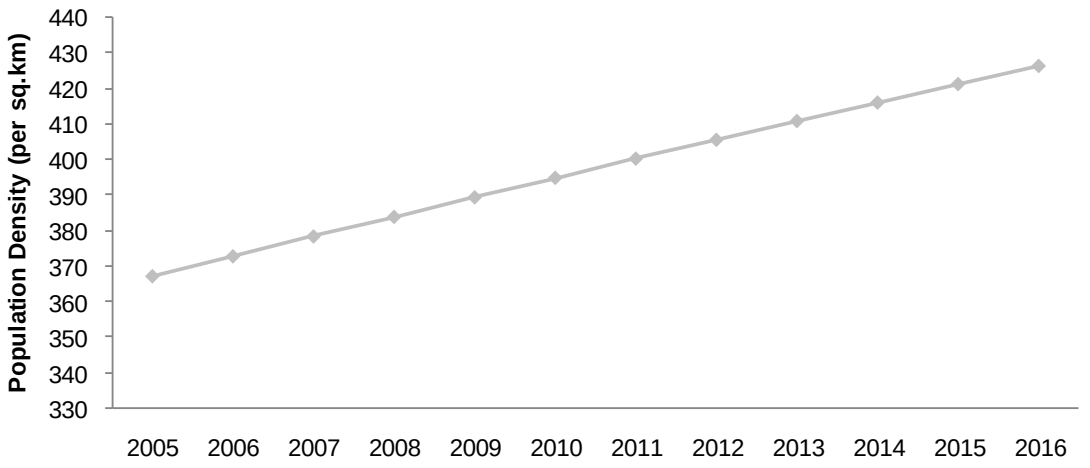


Source: ICD Research analysis

8.5.10 Population density

India's population density was 394.6 per square kilometer in 2010, as compared to 366.9 per square kilometer in 2005. It is expected to be 426.1 per square kilometer in 2016, with the population growing at a constant rate.

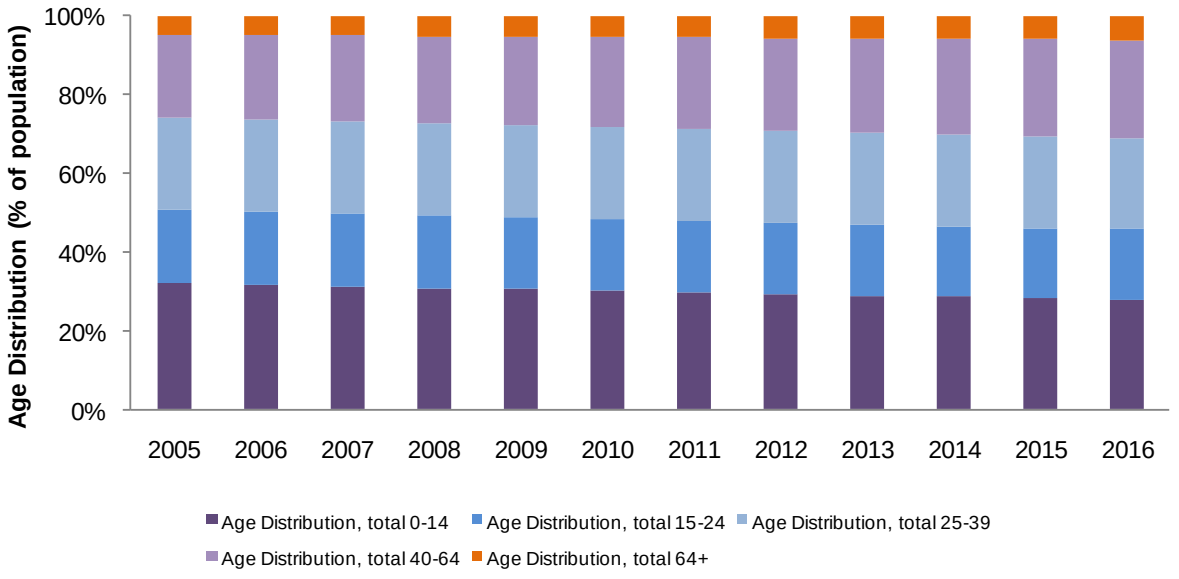
Figure 116: Indian Population Density (per Square Kilometer), 2005–2016



Source: ICD Research analysis

8.5.11 Age distribution – total population

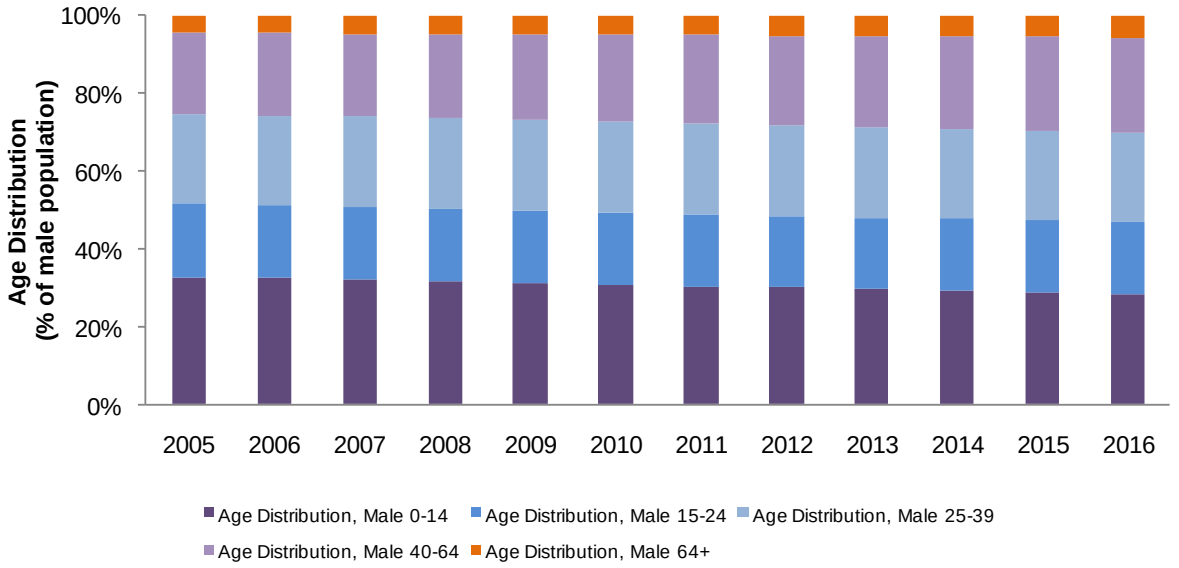
Figure 117: Indian Age-wise Population Distribution (%), 2005–2016



Source: ICD Research analysis

8.5.12 Age distribution – male population

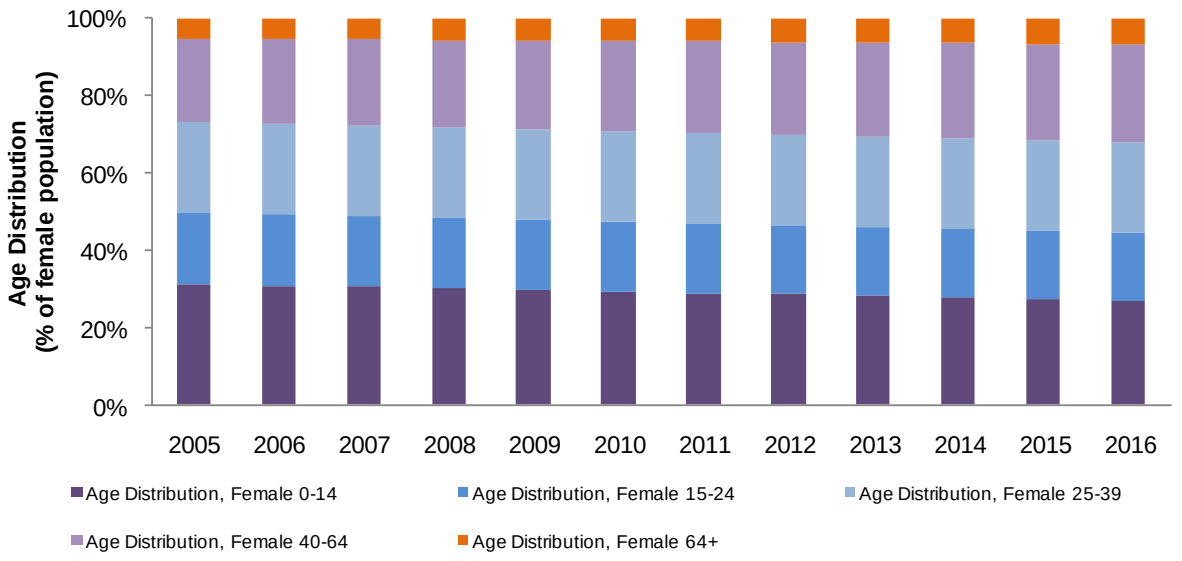
Figure 118: Indian Age Distribution of Male Population (%), 2005–2016



Source: ICD Research analysis

8.5.13 Age distribution – female population

Figure 119: Indian Age Distribution of Female Population (%), 2005–2016

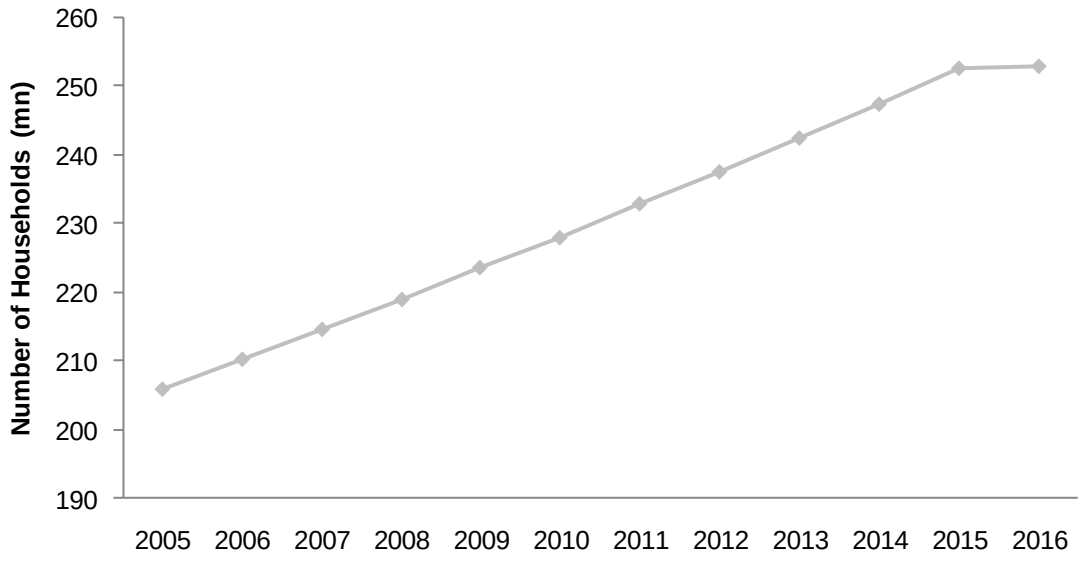


Source: ICD Research analysis

8.5.14 Number of households

The number of households in the country was 228 million in 2010, having grown at a CAGR of 2.06% during the review period. The number of households is expected grow at a CAGR of 1.67% during the forecast period, to reach 252.7 million in 2016.

Figure 120: Indian Number of Households (Million), 2005–2016



Source: ICD Research analysis

8.6 Political and Social Risk

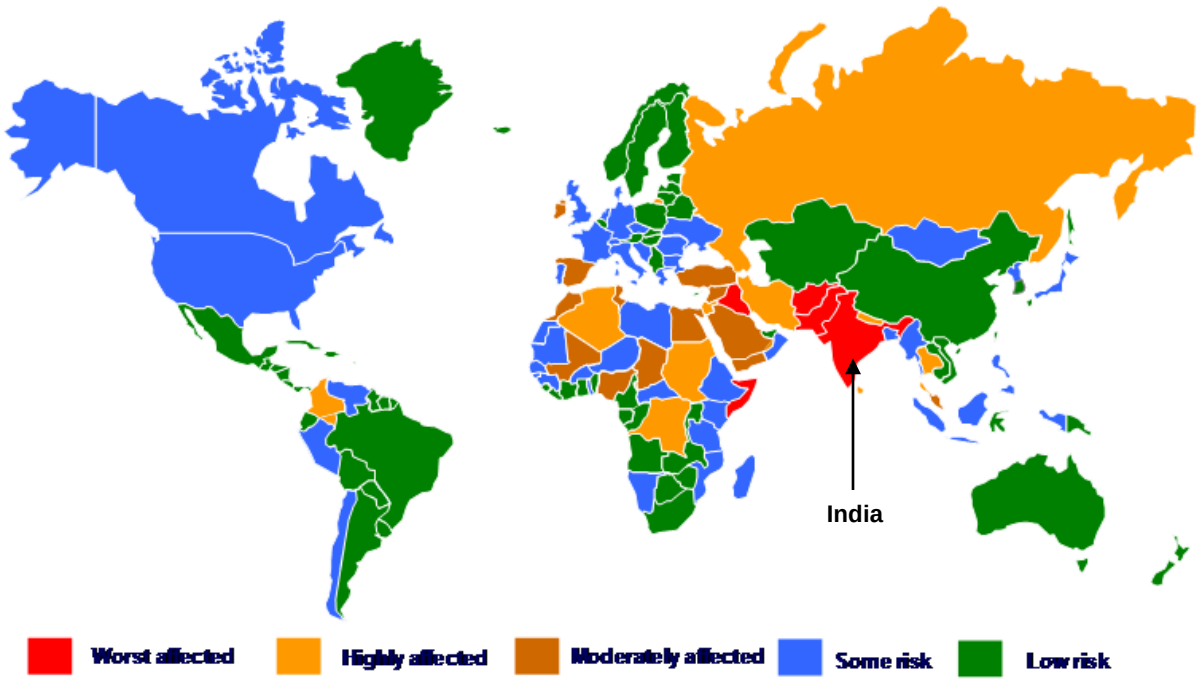
8.6.1 Political stability

Number of governments unable to complete full term in last 10 years: none.
Current form of government: coalition government.

8.6.2 Terrorism index

India falls under the "worst affected" areas on the ICD Research Terrorism Index, with a global rank as the fourth-worst-affected country. During the review period, the threat of terrorism has increased significantly in light of continued terrorist attacks across the country, such as Mumbai 26/11, the war in Afghanistan, and the regrouping and strengthening of the Taliban. In addition, long-running domestic insurgencies, driven by separatist groups such as the Maoists and the Naxalities, continue to pose new challenges for the security forces, in addition to religion-based insurgencies.

Figure 121: Global Terrorism Heat Map, 2010

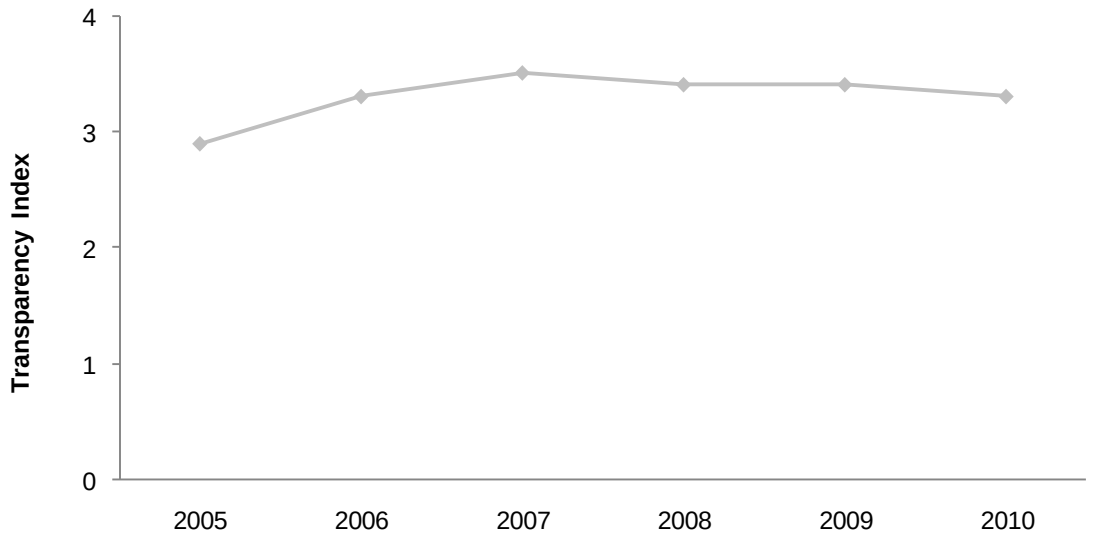


Source: ICD Research analysis

8.6.3 Transparency index

The country's transparency index was 3.3 in 2010, a significant rise from the 2005 level of 2.9, which translates as a reduction in corruption levels. India is ranked eighty-fourth globally on the corruption index, and needs to further reduce its corruption levels during the forecast period to attract more business.

Figure 122: Indian Transparency Index, 2005–2010



Source: Transparency International and ICD Research analysis

Note: Transparency Perception Index is a score that indicates the perceived level of public sector transparency in a country or territory. The score is on a scale of one to 10, in which 10 corresponds to highest degree of transparency. The score is released by Transparency International through 13 independent surveys. A country ranked first in the index would have the highest transparency level, and the score would be closer to 10.

9 Appendix

9.1 Contact Us

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9.2 About ICD Research

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9.3 Disclaimer

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