The Brazilian Defense Industry-Market Opportunities and Entry Strategies Analyses and Forecasts to 2017

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

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 Brazilian defense industry. In particular, it offers in-depth analysis of the following:

- **Market opportunity and attractiveness:** detailed analysis of the current industry size and growth expectations during 2013–2017, 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 Brazilian defense industry.
- **Industry structure:** five forces analysis to identify 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 Brazil, providing an overview of key defense companies (both domestic and foreign), 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 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:**2008 to 2012
- **Forecast Period:**2013 to 2017

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, and the transportation and storage of weaponry and other equipment. 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.

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 missile defense systems.
- **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, ferry troops, or attack other navies, ports, or shore installations. They include 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 disaster. Its margins extend to border and maritime patrol, customs checks in ports and airports, search and rescue operations, disaster recovery, and 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 wherein 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 video 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. Summary Methodology

SDI'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.

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, 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

Primary Research

SDI conducts hundreds of primary interviews a year with industry participants and commentators, in order to validate its data and analysis. A typical research interview fulfills 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, telephone 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

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; therefore, growth rates may appear inconsistent with absolute values due to this rounding method
- The forecasted values are projected on the basis of nominal values; inflation was not taken into account

1.4. SDI Terrorism Index

The SDI Terrorism Index classifies countries across the world into one of the following categories, based on the risk of terrorism:

- Worst affected
- Highly affected
- 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 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 defense industry.

Strategic Defence Intelligence's unique monitoring platform tracks global defense 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 defense industry activity. The site features daily updated analysis, comment and news, company and customer profiles, defense spending, tenders, and contracts, product and technology intelligence, a research and analysis database giving you access to industry and competitor reports to inform your business and market planning, as well as fully customizable tools including instant personalized report generation and custom alerts.

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

2. Executive Summary

Brazil is a peaceful country which is currently modernizing its defense equipment, and is expected to spend US$241.41 billion on defense during the forecast period

Brazil maintains stable and amicable relationships with its neighboring countries, and has not engaged in any major armed conflict with another nation in over 50 years. The country is vast and geographically diverse and is home to the Amazon River and rainforests. It also has large reserves of several natural resources, and has recently discovered substantial oil reserves. The country's defense procurements are largely focused on the protection of its substantial resources from illegal mining, deforestation, and drug trafficking. The Brazilian Ministry of Defense aims to decrease its dependence on foreign OEMs (original equipment manufacturers) and enhancing its domestic defense capabilities. As such, it prefers to procure defense technology from foreign OEMs, which is then constructed by domestic defense companies. This provides domestic defense firms with technology and equipment which they can integrate into their existing systems. The technology procured has assisted the development of the country's aeronautical industry, and continues to provide the Brazilian defense forces advanced attack helicopters, light attack aircraft, and air cargo transport systems.

The total Brazilian defense expenditure is expected to grow at a CAGR of 6.6% during the forecast period. The country is expected to spend 1.5% of its gross domestic product (GDP) on defense during the forecast period, with an average per capita defense expenditure of US$234, which indicates the country's commitment towards protecting its civilians and natural resources. Throughout the forecast period, the country is expected to spend US$20.83 billion on arms procurements. Brazil is expected to allocate as much as 91.4% of its defense budget towards revenue expenditure, of which almost 50% will be used to pay pension allowances to its retired military personnel.

There are attractive opportunities expected to emerge during the forecast period in the Brazilian defense industry, as Brazil will seek to procure fighter jets and components for the development of its indigenous transport aircrafts, submarines, and satellite-based imaging systems to help protect the Amazon region.

Brazil is expected to increase its aircraft exports, supported by increased technology and component procurements from Europe

Although Brazil is currently a net importer of arms, it has focused considerable attention on developing its indigenous defense manufacturing capabilities through offset-enabled technology transfer. Germany is the leading supplier of arms to Brazil, and it mostly supplies components for the manufacture of aircraft and submarines. During the forecast period, the country will continue to focus on the indigenous development of its aerial refueling, air cargo transport aircraft, and diesel-electric submarines, which will lead to an increased demand for importing components.

The Brazilian defense export market is expected to expand, fueled by the sale of its indigenous air cargo transport aircraft, in which a number of countries have expressed an interest. The Brazilian manufacturing companies Embraer and Helibras, which specialize in the manufacture of light attack aircraft and helicopters, are global leaders in defense production. These firms specialize in the creation of superior quality customized defense systems, and are a popular choice for developing countries as they provide an affordable alternative to advanced fighter planes.

Defense deals are secured through competitive bidding and stringent offset obligations

Brazil adopts a competitive bidding approach for both domestic and international acquisitions. In addition to compliance with the defense requirements, a bidder must offer the lowest price with the maximum technology transfer to win a defense contract from the country. Any defense deal worth more than US$5 million has an offset obligation equivalent to 100% of the contract value. The main entry strategy for foreign OEMs is through the direct offset route, which entails the transfer of technology to local companies and the manufacture and assembly of systems in Brazil. However, a number of foreign OEMs have established manufacturing bases in Brazil, in order to capitalize on its low labor costs and availability of raw materials. As such, Brazil is considered to be an export hub for Latin America.

The key challenges for foreign OEMs are the extensive requirements for technology transfer coupled with the delay in the country's approval of defense deals

In order to promote Brazil’s domestic defense industry, the majority of its arms imports deals include technology transfer obligations. However, a number of defense firms are either reluctant to share proprietary information or are prohibited by their country's policy on the transfer of technology. This requirement has been a key deterrent for foreign OEMs entering the Brazilian industry. Foreign OEMs have also been deterred by Brazil’s relatively low defense budget allocation for arms procurements, set at 7.5% of the total defense budget in 2012. Foreign suppliers also face significant delays in the approval of defense deals, as the Brazilian Ministry of Defense takes a considerable amount of time in evaluating offset agreements. This results in constant revisions of offset agreements by bidders attempting to win contracts, which leads to further delays in contract approvals.

3. Market Attractiveness and Emerging Opportunities

Brazil has the highest defense expenditure in Latin America, and contributes 48% of the region's total defense expenditure. Brazil is historically a peaceful country, with a negligible threat from its neighbors, and a history of non-involvement in armed conflict. During the review period, the country's position as a net exporter of arms has reversed, and Brazil now imports defense systems from other nations in order to satisfy its defense requirements.

As Brazil's long-term focus is the reduction of its reliance on foreign arms suppliers, it is working towards enhancing its indigenous defense capabilities through technology transfer agreements. The country currently operates a combination of both domestically manufactured and old foreign defense systems, and is expected to begin a modernization process during the forecast period.

The country's defense expenditure is expected to grow during the forecast period due to Brazil's aim to become the leading arms exporter in Latin America. The country is also expected to spend more on defense over the forecast period due to its current modernization of its outdated defense systems, and the country's desire to protect the Amazon rainforest, Amazon River, and other natural reserves.

3.1. Defense Market Size Historical and Forecast

The Brazilian defense market valued US$38.27 billion in 2012, with US$2.87billion spent on the procurement of military hardware and a considerable amount spent on training, pension payments, maintenance, repair, and overhaul. The country's modernization of its outdated defense systems, and simultaneous focus on the development of its domestic defense capabilities to reduce dependence on foreign suppliers, has resulted in Brazil's pursuing technology transfer agreements. During the review period, the country allocated an average of 1.5% of its GDP to defense, a figure which is among the lowest in the region, and it also has the smallest per capita defense expenditure, in the region of US$195in 2012.

3.1.1. Brazilian annual defense expenditure valued US$38.27 billion in 2012

Brazil had the tenth-largest defense expenditure in the world in 2012. The country's defense expenditure, which valued US$23.81 billion in 2008, grew at a CAGR of 12.6% during the review period, to reach US$38.27 billion in 2012. Throughout the review period the government spent a total of US$155 billion on its defense. The modernization initiatives in Brazil have resulted in higher spending on defense.

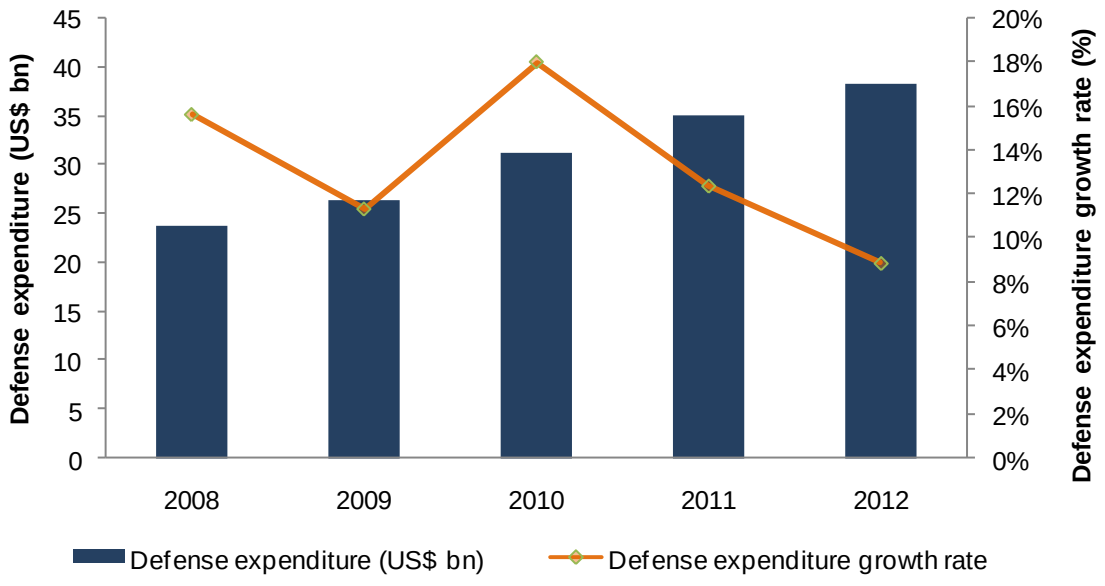
The following table and figure show Brazilian defense expenditure during the review period:

Table 1: Brazilian Defense Expenditure (US$ Billion), 2008–2012

Year	Defense expenditure (US$ bn)	Defense growth percentage (%)
2008	23.81	15.61%
2009	26.51	11.34%
2010	31.28	17.99%
2011	35.15	12.38%
2012	38.27	8.88%
	CAGR2008–2012	**12.6%**

Source: Ministry of Defense and SDI analysis © SDI

Figure 1: Brazilian Defense Expenditure (US$ Billion),2008–2012



Source: Ministry of Defense and SDI analysis © SDI

The Brazilian defense budget, which registered a CAGR of 12.60% over the review period, is expected to continue to grow at a CAGR of 6.6% during the forecast period. The growth in the defense budget has been driven by the government's modernization initiatives. The Brazilian defense budget is expected to grow from US$28.27 billion in 2012, to reach US$54.65 billion by 2017. Throughout the forecast period, the Ministry of Defense is expected to spend a total of US$224.41 billion on defense.

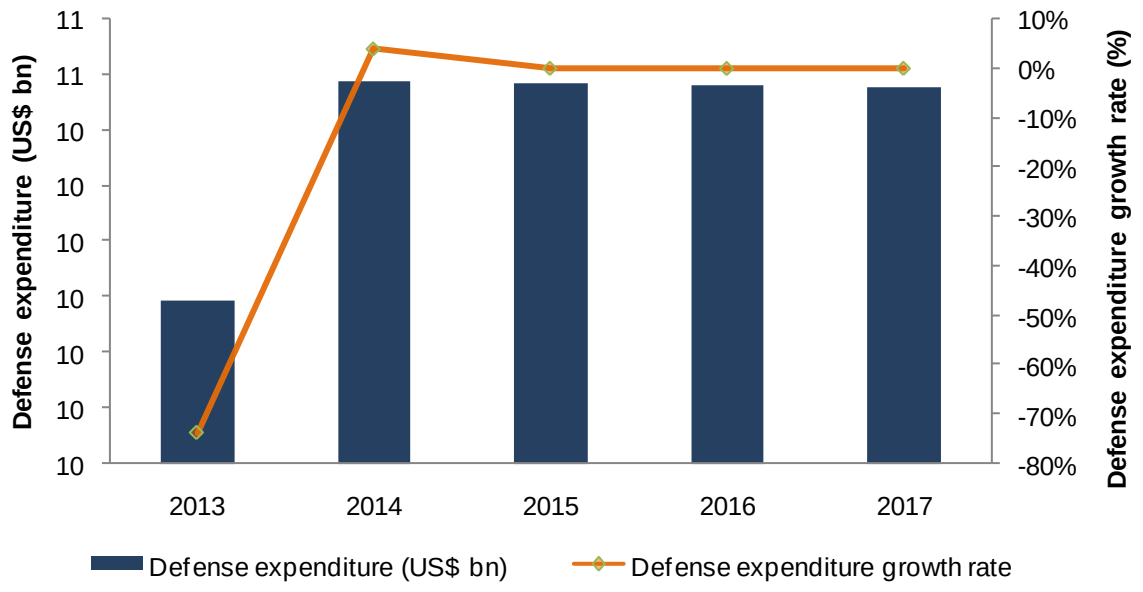
The following table and figure show the projected Brazilian defense expenditure over the forecast period:

Table 2: Brazilian Defense Expenditure (US$ Billion),2013–2017

Year	Defense expenditure(US$ bn)	Defense growth percentage
2013	42.32	10.58%
2014	45.11	6.59%
2015	48.08	6.60%
2016	51.26	6.61%
2017	54.65	6.60%
	CAGR2013–2017	**6.6%**

Source: Ministry of Defense and SDI analysis © SDI

Figure 2: Brazilian Defense Expenditure (US$ Billion),2013–2017



Source: Ministry of Defense and SDI analysis © SDI

3.1.2. Modernization of defense systems, development of indigenous defense capabilities, and protection of the Amazon region expected to drive defense expenditure

During the forecast period, Brazil's defense expenditure will be driven by the following factors:

Modernization of Brazil's defense systems: Brazil grounded 37% of its 719 air force planes due to their age, and the majority of its high-end fighter jets are also non-deployable. As a temporary measure, the country procured 12 second-hand Mirage 2000Cs, and is currently negotiating the procurement of 36 fourth-generation fighter jets from Dassault, SAAB, and Boeing. Brazil also plans to upgrade its domestically manufactured Urutu armored personnel carriers to 2,044 units of Italian-made Iveco Vehicles, in a deal worth US$3.5 billion. Brazil is expected to supplement its patrol systems with 12 refurbished P-3 Orions from Lockheed Martin, which will patrol the Brazilian coastal and maritime economic zones.

Developing Brazil's domestic defense capabilities: Brazil is attempting to develop its domestic defense capabilities to reduce its dependence on foreign OEMs. As such, it has increased expenditure on the procurement of defense technologies from foreign OEMs. The country is currently developing a 19-ton air transport and aerial refueling aircraft, which will require multinational technology, and is also constructing a ship building and naval yard with technology acquired from France. The shipyard is set to drive business in 30 domestic firms for the manufacture of more than 30,000 components for submarine construction.

Protecting the Amazon region: The system for the vigilance of the Amazon program (SIVAM), which the government executed in partnership with Raytheon, involves the patrol and protection of the dense, against deforestation, land invasion, drug trafficking, and illegal mining. The program will have increased funding during the forecast period, in order to improve surveillance through ground-based and airborne radars, as well as through satellite sensors. The expansion of the SIVAM is also expected by including data processing systems to assess radar information. Brazil is currently increasing its investment in the defense of the Amazon region, in order to better monitor both the Amazon jungle and the airspace above it.

3.1.3. Defense expenditure as a percentage of GDP is expected to average 1.52% during the forecast period

The Brazilian defense expenditure amounted to an average of 1.49% of the country's GDP during the review period, which is one of the lowest percentages in Latin America. The country's defense expenditure as a percentage of GDP increased from 1.43% in 2008 to 1.46% by 2012. In addition, the country's per-capita defense expenditure increased at a CAGR of 11.59% during the review period, from US$126 in 2008 to US$195in 2012.

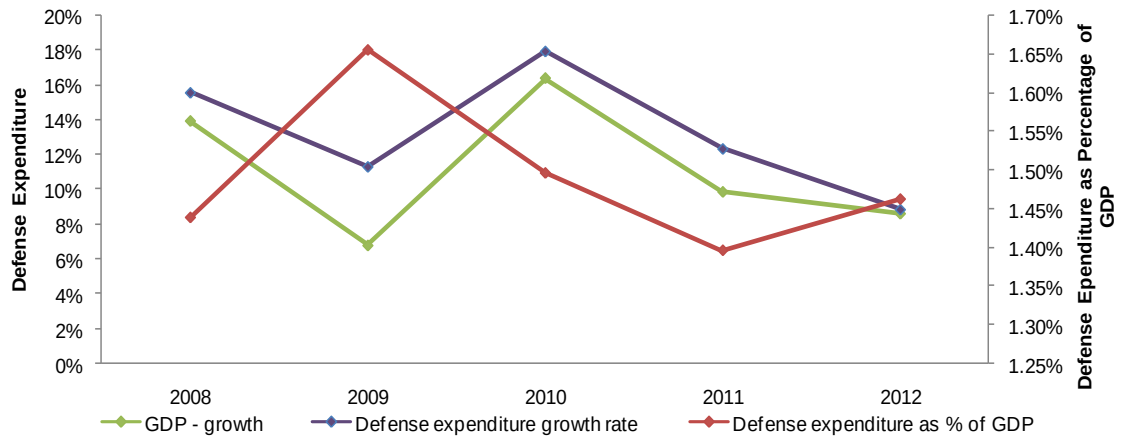
The following table and chart show Brazilian GDP growth vs. defense expenditure growth, and defense expenditure as a percentage of GDP during the review period:

Table 3: Brazilian GDP Growth vs. Defense Expenditure Growth and Defense Expenditure as Percentage of GDP, 2008–2012

Year	GDP growth (%)	Defense expenditure growth (%)	Defense expenditure as percentage of GDP
2008	13.94%	15.61%	1.438%
2009	6.83%	11.34%	1.656%
2010	16.38%	17.99%	1.496%
2011	9.89%	12.38%	1.396%
2012	8.65%	8.88%	1.462%

Source: IMF, Ministry of Defense and SDI analysis © SDI

Figure 3: Brazilian GDP Growth vs. Defense Expenditure Growth and Defense Expenditure as Percentage of GDP, 2008–2012



Source: IMF, Ministry of Defense and SDI analysis © SDI

It is expected that the Brazilian economy will grow at a CAGR of 6.55% over the forecast period, and as such, the country's defense budget is expected to grow strongly to fund the procurement of high-end aircraft and components for domestic submarine and air cargo aircraft development. The defense budget as a percentage of GDP is expected to increase to 1.52% in 2013 due to the fact that the country will be hosting the football world cup in 2014 and the Olympic Games in 2016. The defense budget as a percentage of GDP is expected to increase to an average of 1.52% over the forecast period. The per-capita defense spending is also expected to increase to US$239in 2017.

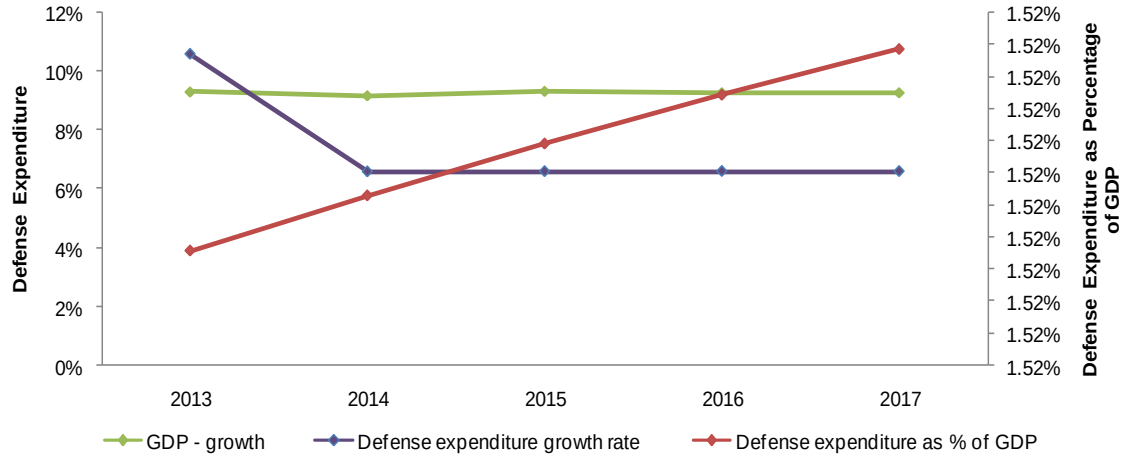
The following table and chart show Brazilian GDP growth vs. defense expenditure growth, and defense expenditure as a percentage of GDP over the forecast period:

Table 4: Brazilian GDP Growth vs. Defense Expenditure Growth and Defense Expenditure as Percentage of GDP, 2013–2017

Year	GDP growth (%)	Defense expenditure growth (%)	Defense expenditure as percentage of GDP
2013	9.32%	10.58%	1.517%
2014	9.18%	6.59%	1.518%
2015	9.34%	6.60%	1.519%
2016	9.29%	6.61%	1.520%
2017	9.29%	6.60%	1.520%

Source: IMF, Ministry of Defense and SDI analysis © SDI

Figure 4: Brazilian GDP Growth vs. Defense Expenditure Growth and Defense Expenditure as Percentage of GDP, 2013–2017



Source: IMF, Ministry of Defense and SDI analysis © SDI

3.2. Analysis of Defense Budget Allocation

3.2.1. The majority of Brazil's defense budget is allocated for revenue expenditure

During the review period, Brazil allocated an average of 93.2% of its total defense budget for revenue expenditure, and the remaining 6.8% for capital expenses. The share of revenue expenditure remained relatively constant throughout the review period.

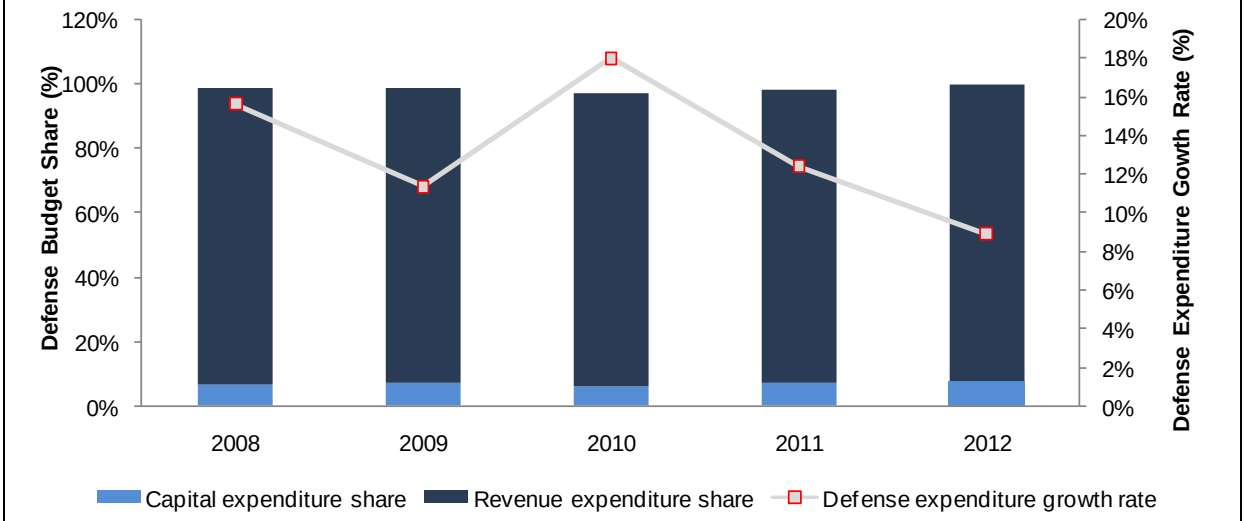
The following table and chart display the Brazilian defense budget share of capital and revenue expenditure during the review period:

Table 5: Brazilian Defense Budget Split Between Capital and Revenue Expenditure (%), 2008–2012

Year	Capital Expenditure Share	Revenue Expenditure Share
2008	6.25%	93.75%
2009	6.80%	93.20%
2010	6.00%	94.00%
2011	7.20%	92.80%
2012	7.50%	92.50%

Source: Ministry of Defense and SDI analysis © SDI

Figure 5:Brazilian Defense Budget Split Between Capital and Revenue Expenditure (%), 2008–2012



Source: Ministry of Defense and SDI analysis © SDI

The share of revenue expenditure is expected to decline to an average level of 91.4% during the forecast period. Meanwhile, the capital expenditure share, which is expected to be 7.9% in 2013, is expected to marginally increase to 8.1% by 2017. This indicates that Brazil is expected to continue its military modernization plans.

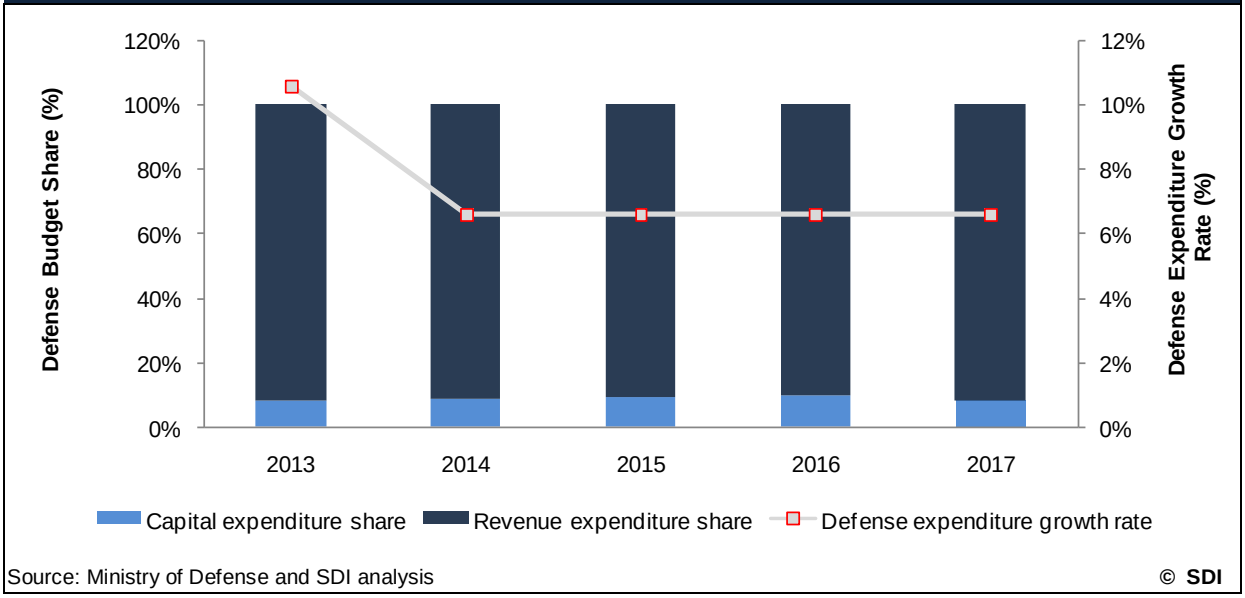
The following table and chart display the Brazilian defense budget share of capital and revenue expenditure over the forecast period:

Table 6: Brazilian Defense Budget Split Between Capital and Revenue Expenditure (%), 2013–2017

Year	Capital Expenditure Share	Revenue Expenditure Share
2013	7.90%	92.10%
2014	8.35%	91.65%
2015	9.20%	90.80%
2016	9.50%	90.50%
2017	8.10%	91.90%

Source: Ministry of Defense and SDI analysis © SDI

Figure 6: Brazilian Defense Budget Split Between Capital and Revenue Expenditure (%), 2013–2017



Source: Ministry of Defense and SDI analysis © SDI

3.2.2. Expenditure for weapons acquisition to reach US$4.43 billion by 2017

The Brazil Ministry of Defense is in the middle of its modernization cycle. The country will be spending a considerable amount on the acquisition of weapons, particularly until2016, due the fact that the country will be hosting the football world cup in 2014, as well as Olympic Games in 2016. This trend will change particularly after 2016. The capital expenditure, which represents the expenditure for weapons acquisition, increased at a CAGR of 17.86% over the review period, and grew from US$1.49 billion in 2008 to US$2.87 billion by 2012.

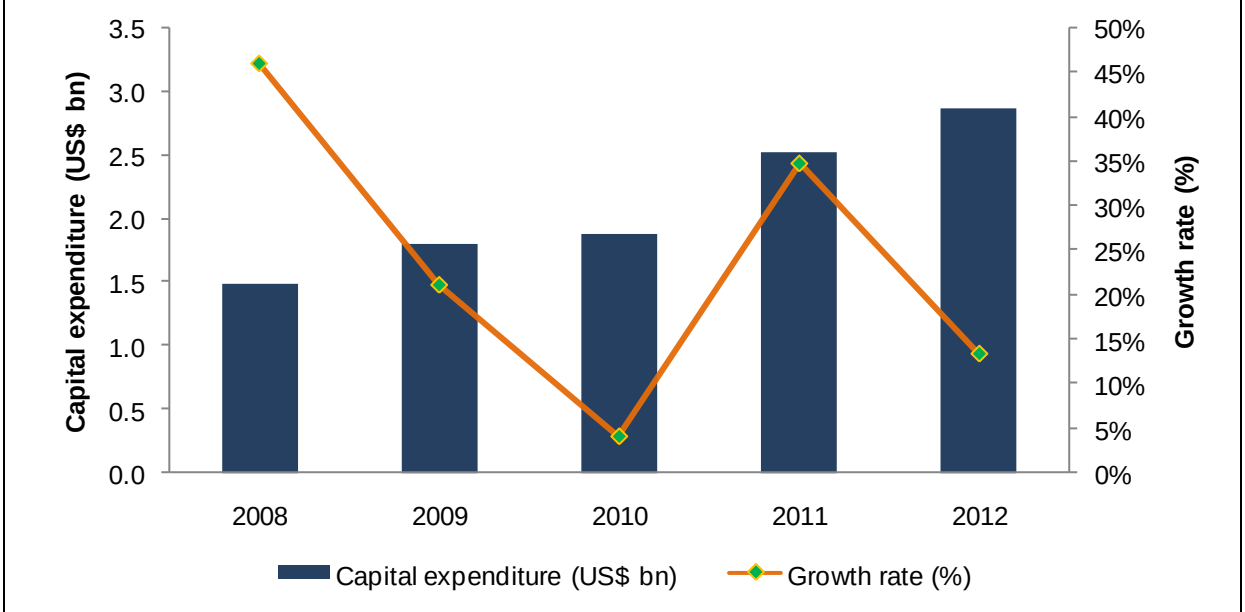
The following table and chart show the Brazilian defense expenditure during the review period:

Table 7: Brazilian Capital Expenditure (US$ billion), 2008–2012

Year	Capital expenditure (US$ bn)	Growth rate (%)
2008	1.49	46.1%
2009	1.80	21.2%
2010	1.88	4.1%
2011	2.53	34.9%
2012	2.87	13.4%

Source: Ministry of Defense and SDI analysis © SDI

Figure 7: Brazilian Capital Expenditure (US$ billion), 2008–2012



Source: Ministry of Defense and SDI analysis © SDI

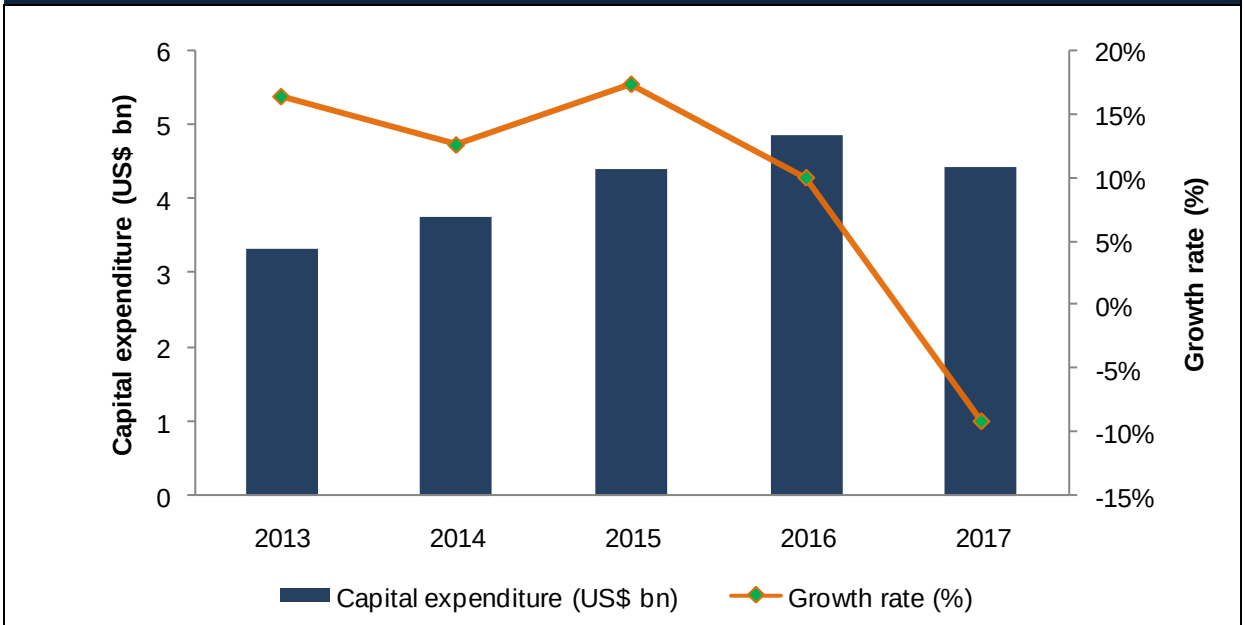
The following table and chart show the Brazilian capital expenditure over the forecast period:

Table 8: Brazilian Capital Expenditure (US$ billion), 2013–2017

Year	Capital expenditure (US$ bn)	Growth rate (%)
2013	3.34	16.5%
2014	3.77	12.7%
2015	4.42	17.5%
2016	4.87	10.1%
2017	4.43	-9.1%

Source: Ministry of Defense and SDI analysis © SDI

Figure 8: Brazilian Capital Expenditure (US$ billion), 2013–2017



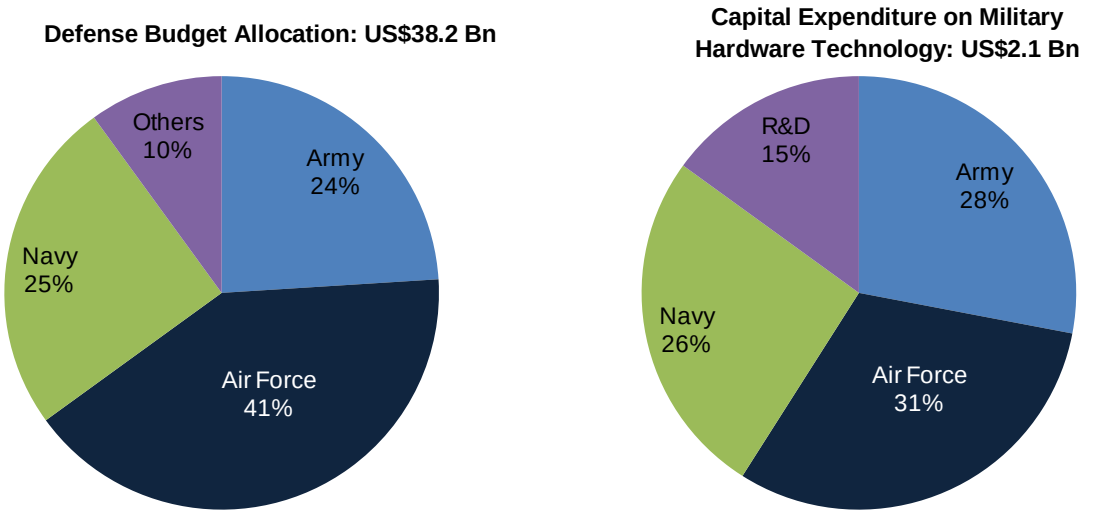
Source: Ministry of Defense and SDI analysis © SDI

3.2.3. Brazil to place focus on defense procurements across the army, navy, and air force

Brazil allocated US$38.27 billion on defense expenditure in 2012, of which US$2.3 billion was spent on acquiring military hardware and on the research of new defense systems. Traditionally, the country allocates an equal amount of finances to the three defense services: the army, navy, and air force. However, the country allocated 25% of its defense budget for the navy in 2012, in order to facilitate the construction of a ship building and naval yard, while it allocated 24% of its budget on the army and 41% on its air force. The Amazon protection system, naval yard construction, and development of indigenous air cargo aircraft are expected to drive army, navy, and air force acquisitions during the forecast period.

The following chart shows the budget allocation and capital expenditure allocation in 2012:

Figure 9: Brazilian Defense Capital Expenditure Breakdown (US$ billion), 2008–2012



Source: Ministry of Defense and SDI analysis

3.3. Homeland Security Market Size and Forecast

3.3.1. Brazil expected to invest US$3 billion in homeland security during the forecast period

Brazil is a vast country geographically, and is expected to be a lucrative market for suppliers of homeland security systems during the forecast period. The country's various geographical features, which include dense forests, the Amazon River, and a long coastline, have resulted in increased reliance on the use of satellite and radar-based imaging systems to monitor and maintain homeland security. In collaboration with Raytheon, the country operates a dedicated Amazon Protection System which monitors the river and surrounding region. The government has also established an agreement with Unisys for Unisys to assist in the monitoring of security across the Brazilian ports.

3.3.2. Protection of natural resources and improvement of security for Brazilian sporting events expected to stimulate homeland security expenditure

There are a number of large natural resource reserves within Brazil, including uranium, nickel, oil, and iron ore. It is also the largest global producer of ethanol, and is home to the ecologically diverse Amazon River and the Amazon Rainforest. The protection of these natural resources is expected to drive homeland security expenditure over the forecast period.

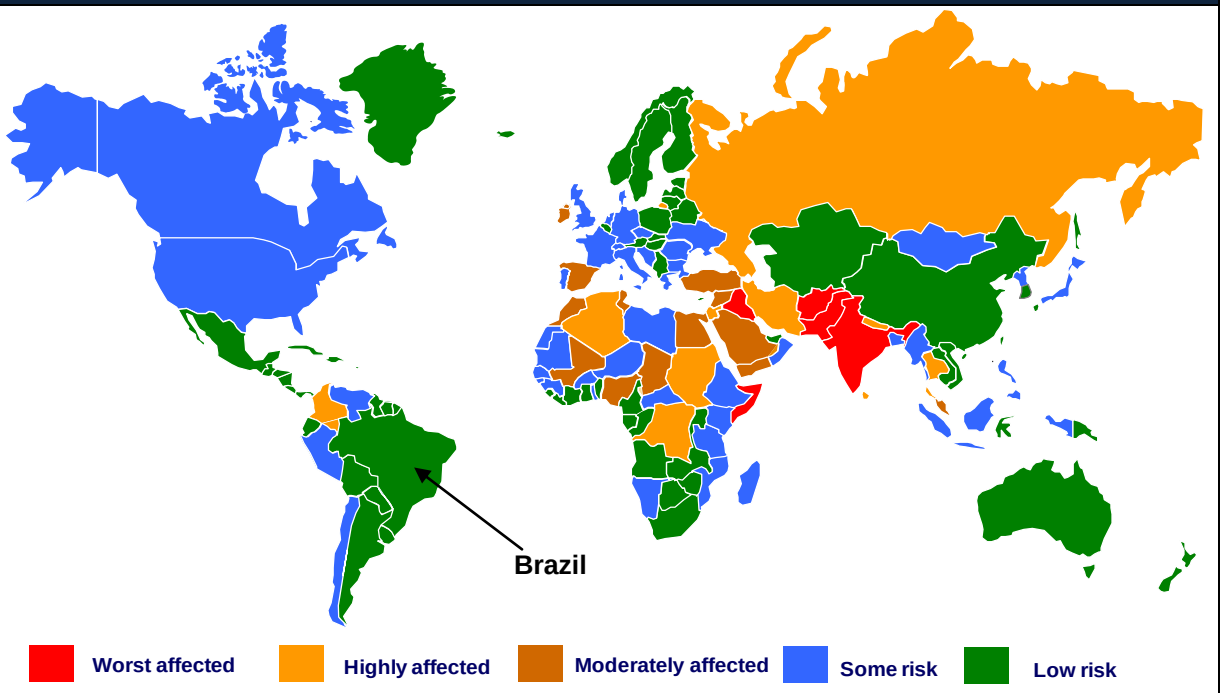
In addition, homeland security expenditure and product procurements are expected to increase during the forecast period to improve security for Brazil's hosting of major sporting events. Millions of spectators are expected to attend the 2014 Football World Cup and 2016 Olympics, which will take place in Brazil and will require additional security. The country has begun discussions with Israeli security companies in order to receive security services and technology in airports and transport systems. During the forecast period, the country will potentially acquire defense systems such as biometric facial recognition, luggage inspection, explosives detection and identification, perimeter defense, and security planning and management in preparation for these major international events.

3.3.3. SDI Terrorism Index rates Brazil to be a "low risk" region

Brazil is categorized as a 'low risk' region according to the SDI Terrorism Index. The country, despite its vast geography, has no threat to homeland security from terrorist organizations and has not experienced any terrorist attack. Through the utilization of extensive radar systems, the country's Amazon Protection System actively monitors and protects the region from drug trafficking, illegal mining, and deforestation.

The following figure displays a heat map based on the SDI Terrorism Index, which indicates the threat level faced by countries across the world:

Figure 10: SDI Terrorism Heat Map, 2011



Source: SDI Terrorism Index

© SDI

3.3.4. Brazil faces minimal threat from terrorists

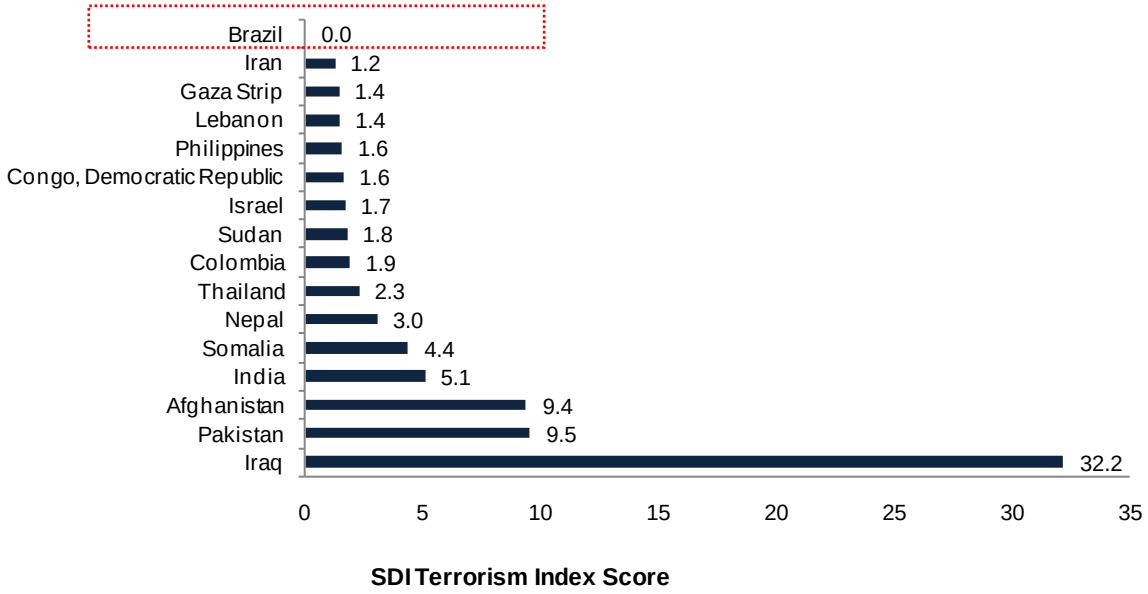
The terrorism index is calculated on the basis of the following factors:

- The number of terrorist attacks 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 5.2 on the terrorism index score, Brazil's score is estimated to be 0.0, indicating a low level risk of terrorist attacks.

The following figure displays the terrorism index score of the top 15 countries in the SDI Terrorism Index:

Figure 11: SDI Terrorism Index, 2011



Index score classification: >4 - Worst affected, between 4 and 1 - Highly affected, between 1 and 0.5 - Moderately affected, between 0.5 and 0.1 - Some risk, and <0.1 - Low risk

Source: SDI Terrorism Index

3.4. Benchmarking with Key Global Markets

3.4.1. Brazil defense expenditure is expected to grow faster than the majority of the largest global defense budgets

Brazil has not come under military attack in over 50 years, and traditionally favors negotiation over military force to resolve disputes with other countries. Through the procurement of foreign technology, Brazil is aiming to enhance its arms export capabilities. The country allocates 41% of its defense budget towards pension payments and is expected to spend only about 8.63% towards arms procurements during the forecast period. Despite this, Brazil's defense expenditure has grown faster than the majority of the world's largest defense budgets, at a CAGR of 12.6% during the review period, and it is expected to register another fast growth rate in the forecast period, at a CAGR of 6.6%.

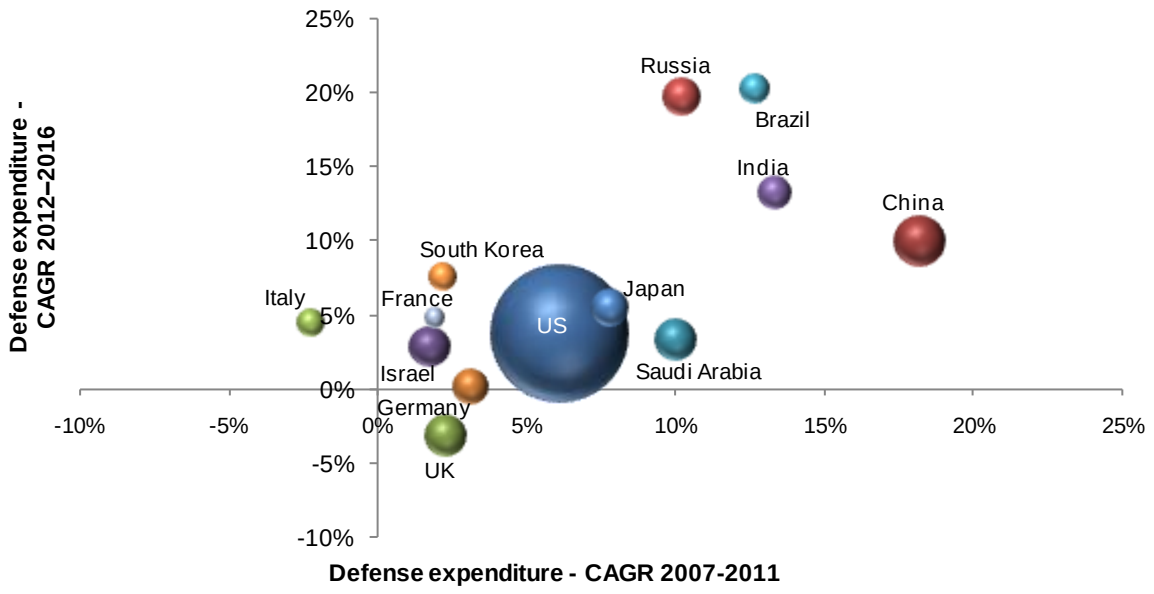
The figure below benchmarks the growth of the Brazilian defense budget with key global markets:

Table 9: Benchmarking with Key Markets – 2007–2011 vs. 2012–2016

Country	CAGR 2007–2011	CAGR 2012–2016	Budget in 2011(US$ Billions)
US	6%	4%	708
China	18%	10%	92
Japan	10%	3%	60
UK	2%	-3%	60
France	2%	3%	59
Russia	10%	20%	51
Saudi Arabia	8%	5%	48
Germany	2%	-1%	41
India	13%	13%	37
Brazil	13%	20%	33
South Korea	2%	8%	29
Italy	-2%	4%	27
Israel	2%	5%	13

Source: SDI analysis © SDI

Figure 12: Benchmarking with Key Markets – 2007–2011 vs. 2012–2016



Note: Bubble size represents 2011 defense expenditure (US$ billions)

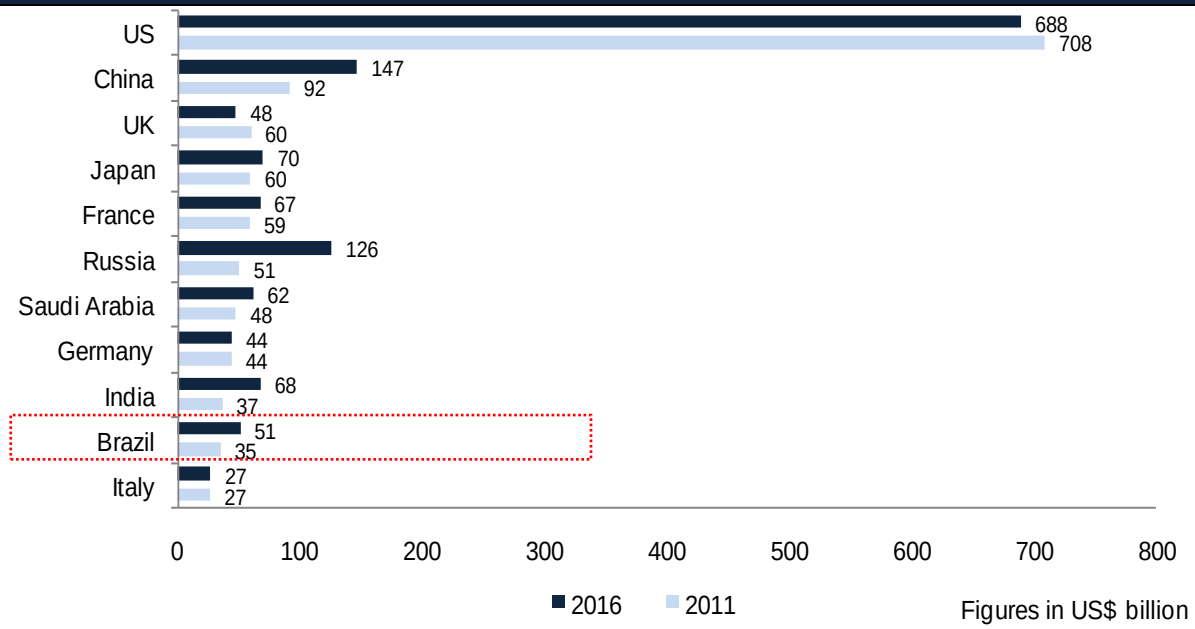
Source: SDI analysis

3.4.2. Brazil set to continue its high defense expenditure

Brazil has the tenth-largest defense expenditure in the world in 2011 and, due to its strong economic growth during the forecast period, it is expected to become one of the top ten defense spending nations by 2016.

The following figure shows the top defense-spending countries in 2011 and those expected in 2016:

Figure 13: Defense Expenditure of the World's Largest Military Spenders (US$ Billion), 2011 and 2016



Note: Figures are rounded off to zero decimal places

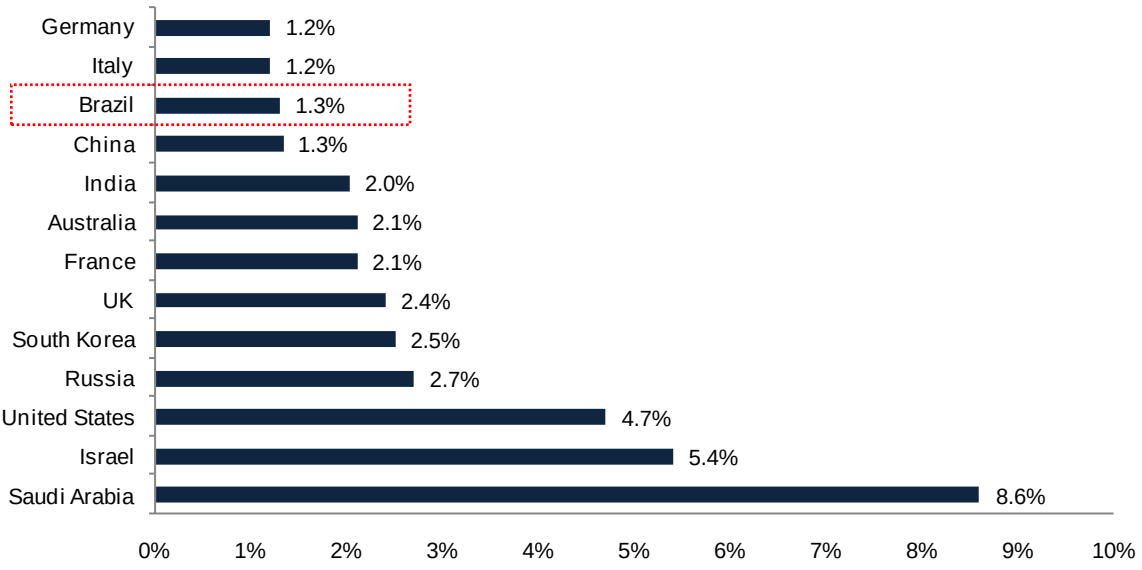
Source: SDI analysis

3.4.3. Brazil expected to spend an average of 1.3% of its GDP on defense over the forecast period

Compared to the largest defense spending countries, Brazil allocated a lower percentage of its GDP towards defense expenditure during 2011. In 2011, the country allocated 1.3% of its GDP towards defense expenditure. During the forecast period, Brazil is expected to spend an average of 1.5% of its GDP on defense expenditure.

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

Figure 14: Defense Expenditure as a Percentage of GDP of Largest Military Spenders (%), 2011



Source: SDI analysis

3.4.4. Brazil faces “low risk” by acts of terrorism

According to the SDI Terrorism Index, Iraq, Pakistan, Afghanistan, Somalia, and India are the countries worst affected by acts of terrorism. Based on the index score, Brazil has a ranking of 113, which indicates some terrorist threat levels when compared to other countries across the world.

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 SDI Terrorism Index score of the top 50 terror-prone countries in the world:

Table10: SDI Terrorism Index

Rank	Country	Index 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
27	Greece	0.5
28	Malaysia	0.5
29	Indonesia	0.4

Table10: SDI Terrorism Index		
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
113	Brazil	0.0
Source: SDI Terrorism Index		© SDI

3.5. Market Opportunities: Key Trends and Growth Stimulators

3.5.1. Procurement of fighter jets and transport aircrafts expected to drive defense expenditure

In order to strengthen its air force, Brazil is currently negotiating the purchase of 36 fourth-generation fighter jets. The Ministry of Defense is evaluating Boeing, Assault, and Saab fighter jets, and although the systems supplied by the three firms meet the ministry's technical requirements, the evaluation criteria is based on lowest price and maximum technology transfer. The acquisition of the fighter jets is expected to increase defense expenditure on compatible trainer aircraft systems and missiles.

Led by the Brazilian company Embraer, with input from foreign defense OEMs, Brazil has launched the US$1.3 billion KC-390 program, through which it aims to construct tactical air transport systems. A certified facility manager from France is expected to join the program, and engines from Rolls-Royce are being assessed for inclusion in the manufacture of the defense systems. The Brazilian Ministry of Defense aims to develop and utilize more than 20 defense systems for the program, which will provide troop and cargo transport, tactical air assault, airborne release of cargo, search and rescue, and aerial refueling.

3.5.2. Indigenous development of submarines is expected to increase naval procurements

Brazil will invest US$9.3 billion in a project to develop non-nuclear class submarines in a joint venture with the French company DCNS. The French technology will be integral to manufacturing these submarines, which will protect Brazil's offshore oil reserves. The contract undertaken by DCNS includes the construction of a naval shipyard in Rio de Janeiro, in which DCNS will utilize its own technology to construct four diesel-electric submarines and a nuclear-powered attack submarine. The project will lead to the increased procurement of naval components over the forecast period.

3.5.3. Amazon protection program to increase use of satellite based imaging systems

The Amazon Protection System, which was established to monitor over one million square kilometers of the Amazon region, is expected to lead to the acquisition of satellite-based radar imaging systems to monitor the entire region and prevent drug trafficking, illegal mining, and deforestation activities. In addition, the program is expected to drive demand for processing systems that will assist the analysis of theimages obtained.

3.5.4. Demand for tactical transport helicopters to increase over the forecast period

Owing to the fact that Brazil will be hosting the football world cup in 2014 and the Olympic Games in 2016, the country intends to strengthen its border as well as homeland security, which provides a huge opportunity to original equipment manufacturers (OEM). The country has recently signed a memorandum of understanding (MoU) with the US for establishing an US–Brazil aviation partnership for military aviation modernization and infrastructure developments. According to the MoU, the US will help Brazil in its airports modernization technologies reverse trade mission (AMTRTM), along with providing technical training to Brazilian officials.

Brazil has allocated a budget of US$500 million to procure 50 Eurocopter's EC-725 model type tactical transport helicopters, which will be used in various military operations. These helicopters incorporate dual engine capability and are used for troop transport, casualty evacuation, combat search and rescue duties, maritime surveillance, humanitarian support, logistic ground support, medical evacuation, and shipborne operations. The aircraft also has the capability to carry side firing armament such as machine guns and cannon. These aircraft can perform in extreme conditions, which make them more desirable the Brazilian defense as well as civil operations.

Furthermore, the country has also allocated US$302 million for research and development (R&D), in order to substitute Lockheed Martin's C–130J model turboprop military transport aircraft with Embraer's KC-390 model type tanker-transport aircraft. During the forecast period it is expected that the demand for substitutes of C–130J will increase to more than 2800 in number, providing an opportunity for the Embraer's KC-390 model type tanker-transport aircraft. The KC–390 aircraft is equipped with a computed air release point (CARP), twin turbofans, and twin engines. The aircraft also has the capability to fly upto a maximum altitude of 10,973m with a maximum speed of 980km/h, and can be used for refueling other in-flight or on-ground aircraft. In addition, these tactical transport aircraft have a huge potential worldwide.

4. Defense Procurement Market Dynamics

4.1. Import Market Dynamics

4.1.1. Europe was the largest supplier of aircraft components to Brazil over the review period

Brazil is currently a net importer of arms, although it plans to develop its indigenous defense manufacturing capabilities to become a net exporter of military equipment. The country has strict offset regulations and prefers suppliers which either offer technology transfer or assemble units locally.

Brazilian aircraft imports account for 45.5% of its total arms procurements, and involve the import of advanced fighter jets and components for the manufacture of indigenous aircraft systems such as helicopters and cargo aircraft. The country's naval procurements include submarines from Germany and France. France has emerged as Brazil's leading arms supplier, and 17.5% of Brazil's imports originate from France. On a number of occasions France has offered technology transfer to Brazil, which has helped it secure defense contracts with the country. Germany supplies engines to Brazilian aircraft and submarine manufacturers, and is the second-largest arms supplier to Brazil. The implementation of the Amazon Protection System (SIVAM) has lead the country to procure radar and satellite components, most of which are supplied by the US defense firm Raytheon. During the review period, Brazil has also procured missile systems from Israel, the US, and Spain, which included anti-ship, anti-submarine, and beyond visual range missiles.

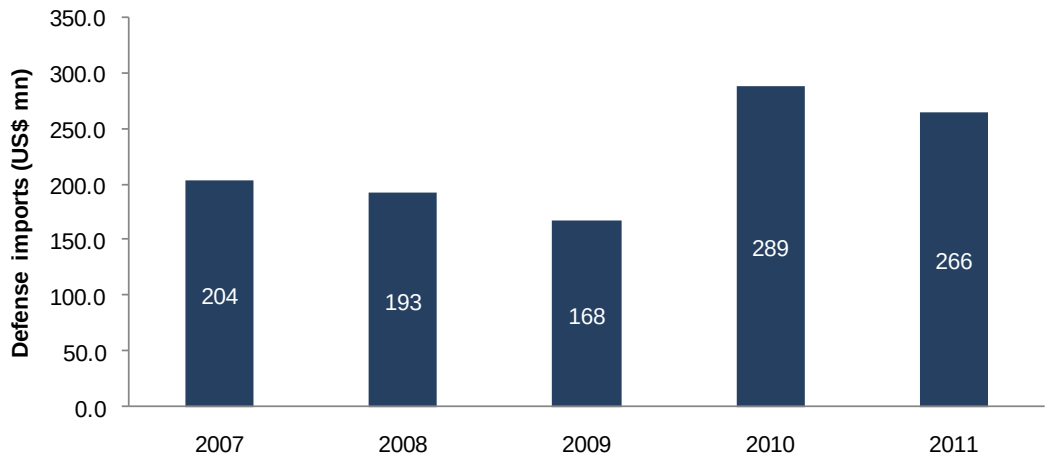
4.1.2. Modernization of defense systems expect to drive arms imports

Brazil's air defense during the review period was mainly equipped with the domestically produced Super Ticino light attack turboprops and second-hand 1980 Mirage 2000s. In order to modernize its aircraft fleet, Brazil is in the process of evaluating the procurement of 36 fourth-generation FX-2 program fighters. The country is considering Boeing, Assault, and Saab for the US$7 billion deal. Although systems manufactured by all three companies satisfy the Ministry of Defense's technical requirements, the government is yet to select a supplier as they are looking to secure the deal which combines the lowest price with the maximum technology transfer.

Over the forecast period, the development of domestically manufactured air transport and refueling aircraft is expected to drive engine and navigation system procurement. The country is also expected to spend US$2.7 billion throughout the duration of the forecast period on procurements for the development of a naval base and a ship building yard. In addition, Brazil will acquire submarine components as part of an agreement with the French company DNCS.

The following figure shows Brazilian defense import trends during 2007–2011:

Figure 15: Brazilian Defense Import Trend, 2007–2011 (TIV values)



Source: SIPRI and SDI analysis

4.1.3. Stringent offset obligations in a highly competitive market

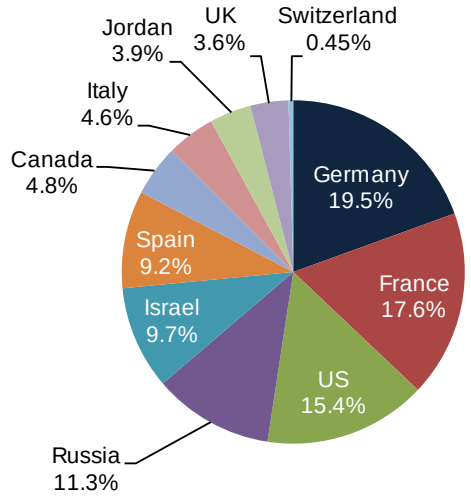
Over the last ten years, Brazil has relied on its arms imports to acquire defense technologies through licensed production, co-production and joint venture. In an attempt to reduce the country's dependence on foreign arms, the Brazilian government has provided funding for a number of domestic defense projects. The region's leading aircraft manufacturer, Embraer, has been instrumental in the implementation of a significant number of foreign technology acquirements. Embraer has developed strongly as a result of its co-production activities with the Italian company Earache, which manufactures a variety of fighter jet components.

Foreign OEMs that are engaged in co-production or joint ventures with Brazilian companies enjoy a variety of benefits such as cheap labor, raw material supply, and favorable government policies, despite the governmental offset requirements. In addition, foreign OEMs gain access to potential South American markets and can use Brazil as a manufacturing hub for defense exports to other Latin American countries.

Technology offset is a key factor in Brazilian defense contracts, and several companies win defense contract bids in the country due to their willingness to transfer technology. For example, France agreed to the supply of technology for the construction of diesel-electric and nuclear powered attack submarines.

The following figure displays the Brazilian arms import trends during 2007–2011:

Figure 16: Brazilian Defense Imports by Country (%), 2007–2011



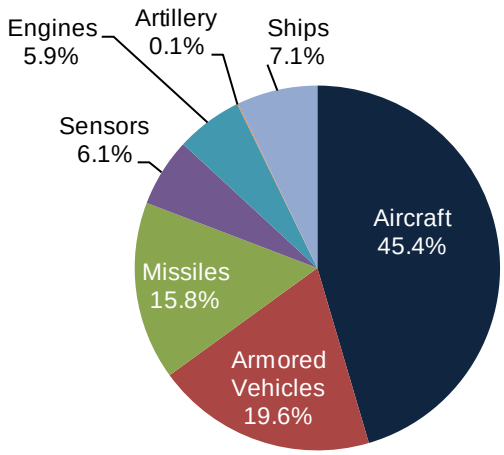
Source: SIPRI and SDI analysis

4.1.4. Missiles, armored vehicles and sensors are most imported military hardware

During 2007–2011, Brazil imported a total of US$1120 million of defense weapons and equipment from 11 countries around the world. In order to further improve its military weapons power, aircraft were the major imported product, with total 45.5% of the defense imports. Armored vehicles and missiles followed with 19.5% and 15.8% of total imports.

The following figure displays Brazilian defense imports by category during 2007–2011:

Figure 17: Brazilian Defense Imports by Category (%), 2007–2011



Source: SIPRI and SDI analysis

4.2. Export Market Dynamics

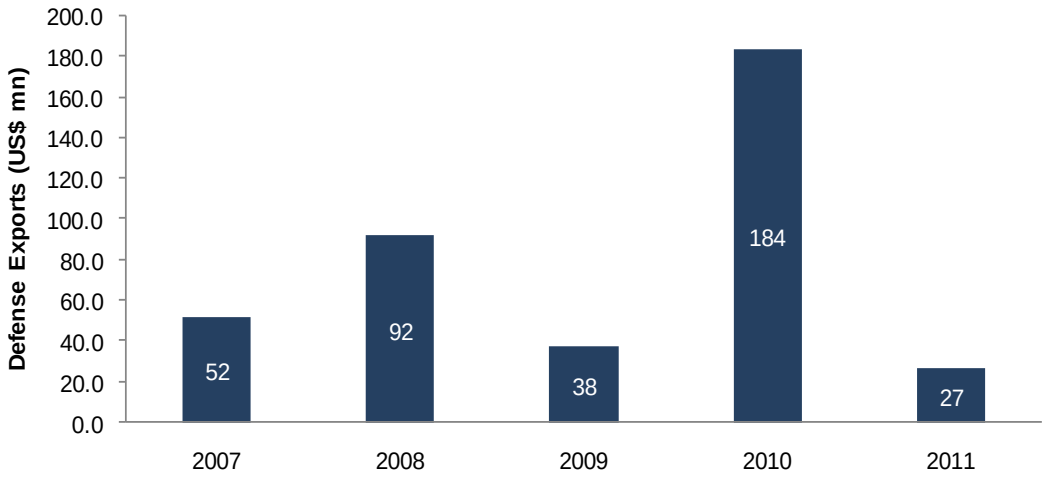
4.2.1. Development of domestic defense capability is expected to fuel exports in Brazil's emerging military industry

During the 1980s, Brazil was a net exporter of arms, which was supported by the demand for high-quality and low-cost defense systems in developing countries. However, intense competition from the foreign OEMs of developed countries resulted in the loss of business and eventual closure of several Brazilian defense firms. During the review period, Colombia and Greece were the major recipients of Brazilian defense systems due to their purchase of combat aircraft EMB-314 and early warning system EMB-145.

In order to overcome foreign competition, Brazilian defense companies have begun to focus on the procurement of technology which will allow domestic manufacture. Over the review period, aircraft sales have accounted for the majority of Brazil's defense exports, contributing 86% of the country's total defense exports. In order to further promote arms exports, the Brazilian government has announced plans to increase loans to defense firms. The country is expected to concentrate on the African, Middle Eastern, and East Asian defense markets, and plans to construct customized defense systems at a low cost.

The following chart shows Brazilian exports by financial value during the review period:

Figure 18: Brazilian Defense Exports By Value (%), 2007–2011



Source: SIPRI and SDI analysis

4.2.2. Customized aircraft systems expected to drive exports during the forecast period

Brazilian defense firms will focus on the identification of niche markets, and will attempt to cater to them through the customization of defense systems based on function, cost, and quality.

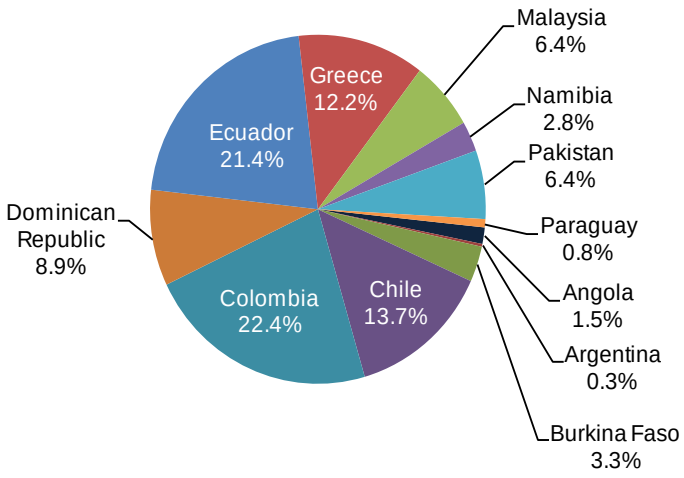
Embraer, which is one of the major aircraft manufacturers in the world, successfully constructs customized defense systems and generates 90% of its revenue from global sales, which includes both civilian and military aircraft. Embraer is currently developing the 19-ton KC390 military transport aircraft, which will compete with Lockheed Martin's C130 and Kawasaki's XC-2. The construction of this aircraft will rely on multinational technology and components. As such, the success of the aircraft will promote sales in participating nations. France, Sweden, and Portugal have each expressed an interest in procuring the KC390, which is anticipated to increase Brazilian exports.

In order to expand Brazilian aviation exports, Brazil signed a US$1.2 billion contract with Eurocopter to acquire French aviation technology in 2008. Eurocopter's Brazilian subsidiary, Hegiras, will act as the manufacturing hub for the sale of Eurocopter helicopters in Latin America.

Embraer's Super Ticino aircraft, a light attack, counter insurgency, and pilot trainer system, is popular in developing countries and has been used in Chile, Colombia, and Indonesia. These systems are suitable for small specialized missions which require immediate threat response, but do not require high-end attack aircraft such as F-16s. During the forecast period, the export of early warning systems is expected to increase, with India, Mexico, and Greece purchasing the EMB 145 airborne early warning and control (AEW&C) system in order to carry out aerial surveillance, mission coordination, and border surveillance.

The figure below shows the volume of Brazilian defense exports during 2007–2011:

Figure 19: Brazilian Defense exports by Country (%),2007–2011



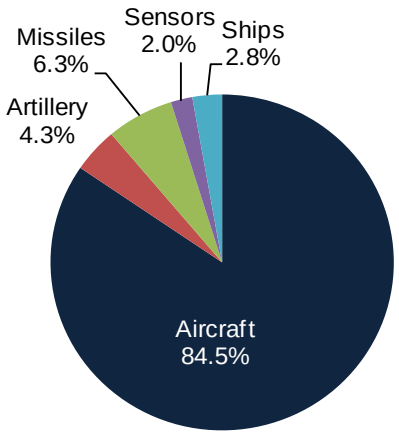
Source: SIPRI and SDI analysis

4.2.3. Ships and armored vehicles are the main exported defense products

During 2007–2011,aircraft accounted for 84.5% of Brazil's defense exports,exporting333aircraftto 12countries.

The figure below shows the volume of Brazilian defense exports by country during 2007–2011:

Figure 20: Brazilian Defense Imports by Category (%),2007–2011



Source: SIPRI and SDI analysis

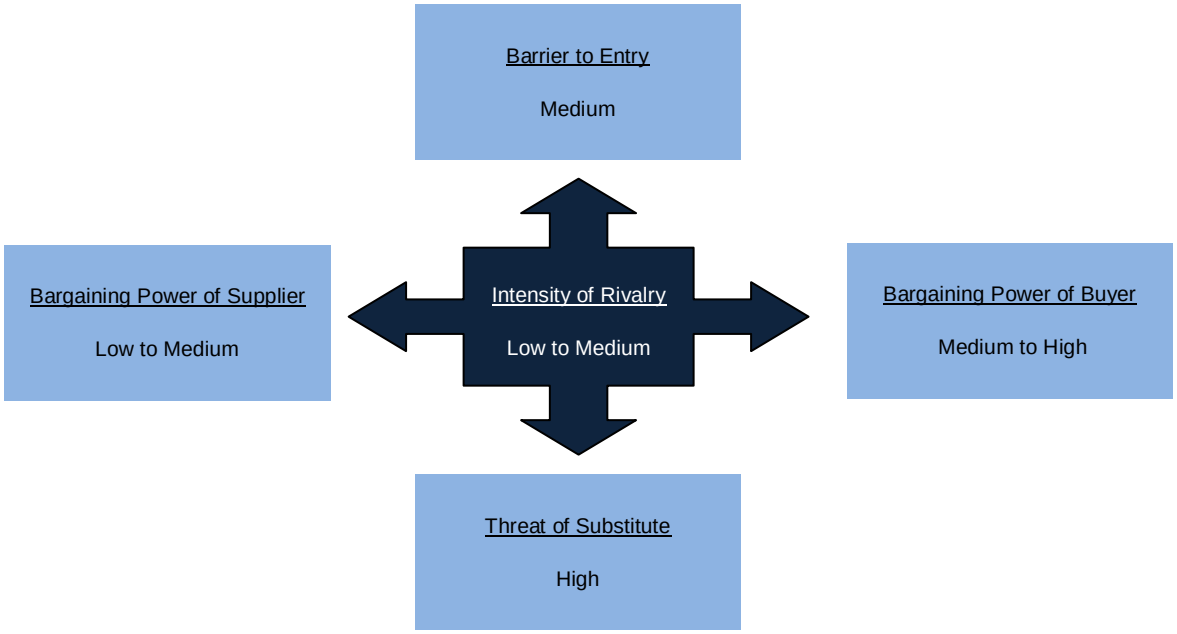
5. Industry Dynamics

5.1. Five Forces Analysis

Procurements for the Brazilian defense industry are undertaken by individual defense services. According to Porter's five forces analysis, the Brazilian defense industry's bargaining power is high for advanced systems purchases as a result of the technology transfer requirements, and medium for purchases involving components for aircraft and submarine manufacture. The bargaining power of suppliers of high-end systems is low due to the country's extensive technology transfer offset requirements. The entry barrier for the industry is medium. Due to the country's offset requirements and delays in the approval of deals, the enter barriers are relatively high; however, the entry barriers are lowered by the country's availability of inexpensive labor and raw materials. The intensity of rivalry is low among domestic firms as each company caters to different defense demands, while rivalry is medium among foreign OEMs as several firms compete to supply high-end defense systems. The threat of substitution is high as foreign OEMs offer similar systems differentiated only by price and the technology transfer offered.

The following sections provide a Porter's five forces analysis of the Brazil defense industry.

Figure 21: Industry Dynamics – Porter's Five Forces Analysis



Source: SDI analysis

5.1.1. Bargaining power of supplier: low to medium

The bargaining power of suppliers for high-end defense equipment, which includes fighter jets and submarines, is low due to the country's constant demand for technology transfer and the large amount of bidders which offer competition for defense deals. The bargaining power of suppliers of medium- and low-end defense equipment is medium, as procurements are often for niche products, such as armored personnel vehicles, which often involve the purchase of components that are available at more established prices.

5.1.2. Bargaining power of buyer: medium to high

All defense procurements are acquired by the Ministry of Defense through the individual defense division. The bargaining power of the buyer for high-end defense equipment is high due to the country's stringent offset rules involving technology transfer. The bargaining power of the buyer for medium- and low-end defense equipment is medium as Brazil is dependent on foreign suppliers for components and technology.

5.1.3. Barrier to entry: medium

The barrier to entry for defense firms in the country is governed by two factors. Firstly, Brazil's stringent offset obligations act as a deterrent for foreign OEMs who plan to enter the country's defense market, as companies are often required to transfer technology or assemble the defense system in Brazil. Secondly, the availability of low-cost labor and raw materials encourages foreign OEMs to use Brazil as a hub for the manufacture and export of defense systems to other Latin American countries.

5.1.4. Intensity of rivalry: low to medium

The intensity of rivalry is low among domestic entities in Brazil, as each firm operates in its own niche segment and contributes to a specific requirement in the development of a defense system in the country. However, the intensity of rivalry among foreign firms is medium as several companies compete for high-end defense contracts, and are often selected depending on which company offers the lowest price and highest degree of technology transfer.

5.1.5. Threat of substitution: high

The threat of substitution for high-end defense systems is high as competition is provided by suppliers from both the US and Europe. Competitors offer systems which have similar specifications; however, the final decision is based upon the amount of technology the supplier is willing to offer.

6. Market Entry Strategy

6.1. Market Regulation

6.1.1. Defense deals for domestic and international procurements are decided by competitive bidding

All defense acquisitions made by the Ministry of Defense and associated bodies follow a competitive bidding process. The Ministry of Defense decides which company from which to procure equipment, depending on whether the equipment complies with the ministry's requirements, which company offers the lowest price, and which company offers the most technology transfer. The rule applies for both domestic and foreign suppliers without any preferential treatment for domestic suppliers.

6.1.2. Stringent offsets requirements for all defense procurements

The Military of Defense procurement program in Brazil is governed by the Brazilian National Defense Strategy, and focuses on driving industrial participation through decentralized offset management. As previously mentioned, offset management aims to obtain the maximum possible technology transfer through defense deals in order to boost local production. The Brazilian air force, which manages offsets associated with its procurements, has previously executed agreements worth US$4 billion and has a further 18 deals under negotiation. The strategic offset obligations are overseen by Estado-Mayor ad Aeronautical (EMAER), while the resulting technology is monitored by the Secretariat of Economy and Finances (SEFA). Other procurements are managed by the Ministry of Defense.

The following table provides an overview of the country's offset guidelines:

Table 11: Brazil – Offset Guidelines and Agreements

Key Characteristics of Offsets	Offset Guidelines
Program objectives	Applies to defense and aerospace industries
Offset threshold	US$5 million
Offset type	Accepts both direct and indirect, with the direct offsets being the preferred type
Offset percentage	100% of the contract value.
Multipliers	Defense procurements: decided on a case-by-case basis Air force procurements: set at 1 to 4
Penalties	Defense procurements: decided by the federal government Air force procurements: are credit-increase-based settlements and/or liquidated damages
Eligibility	Transfer of technology, investments, co-production, licensed production, marketing support, training, and other forms of countertrade Air force procurements: decided on a mandatory MoU (memorandum of understanding) for all air force procurements
Performance period	Contract period
Waiver	Air force procurements: obligations are waived when supplied by a single source, government-to-government international agreements (except under competitive environments).Five percent of the obligation is bank guaranteed

Source: SDI analysis

6.2. Market Entry Route

6.2.1. Foreign OEMs follow direct offset route to enter defense market

Foreign OEMs are entering the Brazilian defense market through the transfer of technology for the development of domestic companies' defense systems. These foreign companies enter into industrial cooperation agreements, which enable domestic defense firms to manufacture and assemble the defense products. The country encourages foreign OEMs to follow this route, and technology transfer often becomes the deciding criteria for future deals involving the firm.

The European Aeronautic Defense & Space Company's (EADS) Eurocopter utilized this technology transfer route in order to become a subsidiary of the Brazilian company Hegiras, which now wholly owns the firm. Hegiras has emerged as the market leader of attack helicopters in Latin America, and acts as a hub for Eurocopter's Latin American productions.

France has agreed to provide extensive technological assistance in submarine construction and the development of naval bases, to become the supplier of the FX-2 program, factors which have given it an advantage over its competitors such as the Swedish company Saab and the US-based company Boeing.

6.3. Key Challenges

6.3.1. Complying with Brazil's requirement for extensive technology transfer

Brazil has a strict offset obligation for defense deals equivalent to 100% of the contract value. This has proved a challenge for foreign OEMs whose government has a policy of limited technology transfer, including the US-based company Boeing. Moreover, Brazil's offset policy requires that defense contracts use domestic companies for the manufacture and assembly of defense systems. A number of foreign OEMs have agreed to such offset requirements due to the availability of inexpensive labor and raw materials in the country. However, a significant portion of these companies are reluctant to share proprietary information with Brazil, and often fail to supply defense systems to the country as a consequence. These rigorous requirements by Brazil often delay the approval of defense deals.

6.3.2. Delay in the closure of defense deals and low allocation for capital defense expenditure

A significant challenge faced by defense suppliers to Brazil is the time taken by the Ministry of Defense to ratify defense deals. Since defense procurements occur through competitive bidding, competing companies must undergo technical compliance checks, after which the ministry enters a lengthy negotiation process with bidders designed to secure the maximum technology transfer at the lowest price. As such, the ratification process is further delayed by long negotiation periods and competing offers given by the various defense firms. Examples include the delay in selecting a supplier for the fourth-generation fighter jets and the delayed purchase of armored personnel carriers from the Italian branch of Invesco Ltd.

Despite having the eleventh-largest defense expenditure globally, Brazil only allocates around 6–7% of its total defense expenditure on arms procurement. The country currently allocates 41% of its defense budget on providing pensions for retired military personnel, and a significant amount is spent on the administration of its defense forces. Although domestic advancements by Brazilian defense firms are fueling the component procurement market, the deal value for these components is often small. This results in the Brazilian defense industry appearing as a relatively less attractive investment opportunity for foreign OEMs.

7. Competitive Landscape and Strategic Insights

7.1. Competitive Landscape Overview

Brazil's defense policy has led the country to improve its domestic defense capabilities and reduce its reliance on arms supplied by foreign OEMs. The country has an established aircraft manufacturing industry which caters to the air force's needs, with the exception of high-end fighter jets. The country has a policy of acquiring technology from foreign OEMs, which is then manufactured indigenously. The domestic firms enter into joint ventures with foreign OEMs to procure technology, which is driving Brazil's arms exports.

7.2. Key Domestic Companies

7.2.1. Embraer: overview

Empresa Brasileira de Aeronautica SA (Embraer) was founded as a government initiative in 1969 and was later privatized in 1994. Embraer is one of the world's largest aircraft manufacturers, with a specific focus on commercial, defense, and executive aircraft. The company's defense aviation division focuses on intelligence, surveillance and reconnaissance (ISR) systems, cargo, combat, training, and transport.

The company's major stakeholders include Previ, Cia Bozano, Thornburg investment management, and the Oppenheimer fund. Embraer's subsidiaries are Indústria Aeronáutica Neiva, Embraer Aircraft Maintenance Services Inc. (EAMS), and Indústria Aeronáutica de Portugal SA (OGMA). The company employs more than 16,800 people, and during 1991–2001 it was Brazil's largest defense exporter. It has offices, industrial operations, and customer service facilities in Brazil, China, France, Portugal, Singapore, and the US.

7.2.2. Embraer: products and services

Table12:Embraer– Product focus

Products	Services
ISR systems	**NA**
EMB 145 AEW&C	
EMB 145 MULTI INTEL advanced remote sensing/ airborne ground surveillance and intelligence	
EMB 145 MP maritime patrol and anti-submarine warfare	
Cargo	
KC-390 medium-lift military transport	
Combat and training	
Super Tucano	

Source: Company website and SDI analysis © SDI

7.2.3. Embraer: recent announcement and strategic initiatives

2012: The company announced that it has delivered the first 2Embraer 190 model type jets to the Ukrainian Aviation Group Alliance (UAG) and will deliver 3 more e-jets by the end 2012.

2012: The company announced the first flight of its modernized A-1M model light attack jet.

2012: The company attended the 2012 edition of the Singapore Airshow to showcase its EMB 314 model Super Tucano aircraft and the EMB 145 ISR Family of fighter aircrafts.

2011: Embraer successfully performed the first of 3 EMB 145 model Airborne Early Warning and Control (AEW&C) aircraft that were developed for the Indian government.

2011: Embraer announced the selection of Aeroelectronica (AEL) Sistemas to provide the mission computer system for the KC-390 model airlifter, which is under development for the Brazilian Air Force.

2010: Colombia has added its name to the list of South American countries which are in talks with Embraer over becoming a partner in the KC-390 tactical airlifter program.

2009: Embraer delivered two of the eight Super Tucano aircrafts to the Dominican Republic government. The airplanes will be used for internal security missions, border patrols, and to control drug trafficking.

2009: Embraer formalized the delivery of protocol developed for the data link system, Link BR-2, to Brazil's Aeronautics Command. This protocol will assist the Brazilian Air Force in operations with a data exchange system. For joint missions, it is also adaptable for interoperability with the Brazilian Navy and Army.

2009: Embraer delivered its 100th Super Tucano aircraft in May 2009. Embraer received orders for its aircraft from the Chilean, Dominican, and Ecuadorean air forces.

2009: Embraer delivered the first four Super Tucano airplanes to the Chilean Air Force (FACH). The delivery is part of a 12-plane contract awarded to Embraer in August 2008 as a result of competitive public bid by FACH. The air force chose Embraer Super Tucano planes due to the tactical training of its pilots.

7.2.4. Embraer – alliances

Table13:Embraer– Alliances			
Alliance	**Partner Company**	**Year Formed**	**Strategic Objectives and Focus Area**
Joint Venture	Boeing	2012	**Product Focus**: To collaborate on KC–390 program in order to share specific technical knowledge and evaluate markets.
Joint Venture	Zodiac Aerospace	2012	**Product Focus:** To manufacture cabin interior parts for the Embraer 170/190 family of jets in a manufacturing facility located in Mexico.
Joint venture	Elbit Systems	2011	**Product Focus**: To develop new unmanned air systems (UAS) and supply a key component for the KC-390 airlifter and tanker.
Teaming agreement	BAE Systems	2010	**Product Focus**: To provide software, hardware, system design, and support integration of the flight control computer.
MoU (Memorandum of Understanding)	CDB Leasing Co. Ltd (CLC)	2009	**Market focus**: Embraer and CDB Leasing Co. Ltd. (CLC) signed a memorandum of understanding. CLC is a major financial leasing company held by the China Development Bank (CDB). The deal was formulated to enhance the financial opportunities for the acquisition of Embraer aircraft in China and abroad. The deal value is expected to rise to US$2.2 billion over the next three years in aircraft financing and leasing.
Source: Company website and SDI analysis			© SDI

7.2.5. Embraer: recent contract wins

Table14:Embraer– Recent Contract Wins			
Date	**Contract value**	**Client**	**Description**
2012	US$ 50 million	Mauritania Air Force	To provide A-29 Super Tucano type turboprop aircrafts for counter-insurgency missions.
2011	Not available	Colombian Air Force	To modernize 14 EMB-312 Tucanos.
2011	US$1.12 billion	Brazilian Air Force's COMAER (Comando da Aeronautica)	To modernize 43 AMX International–built AMX jet fighters.
2011	US$105.3 million	Ghana Air Force	To buy one Embraer E 190 jet and a hangar.

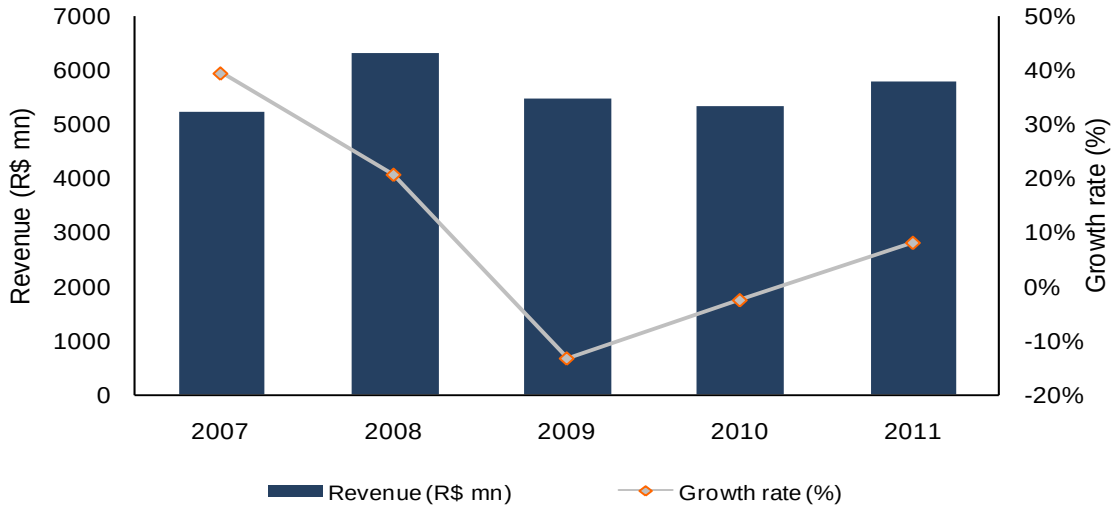
Table14:Embraer– Recent Contract Wins			
2011	Not available	Brazilian Ministry of Defense	Modernization of 11 F-5 Tiger Fighters.
2010	Not available	Indonesian Air Force	Sale of eight Super Tucano light attack and advanced training turboprops.
2009	Not available	The Brazilian Navy	Embraer signed a contract to technologically upgrade 12 Brazilian navy jets, nine AF-1s (single seat) and three AF-1As (two seat). The event took place in Latin America Aero and Defense (LAAD) trade fair in Riocentro.
Source: Company website and SDI analysis			© SDI

7.2.6. Embraer – financial analysis

Embraer recorded revenues of US$5.8 billion for the fiscal year 2011; this grew at a CAGR of 9.07% during the period 2007–2011.

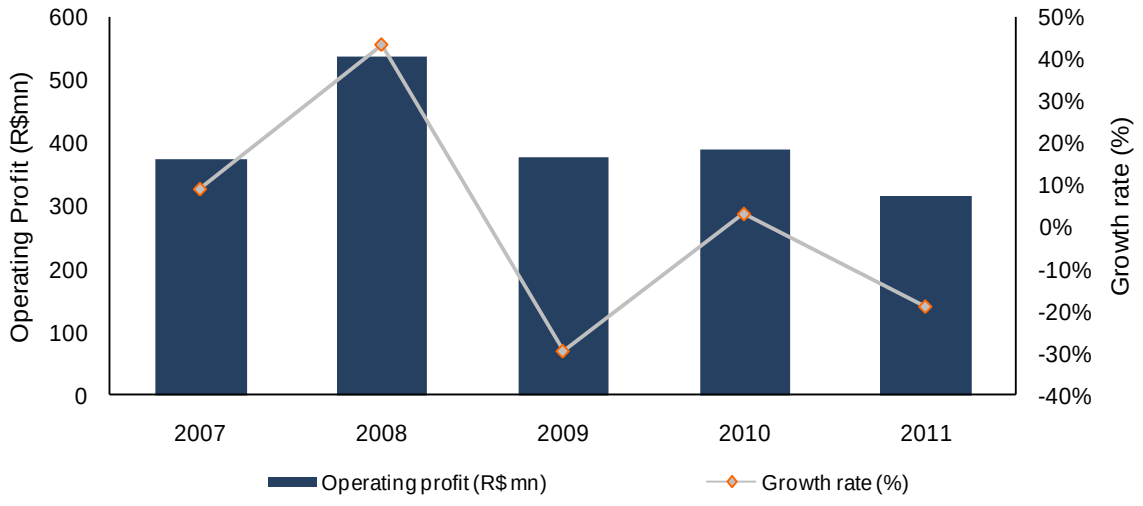
The following figures show the trend for revenue, operating profit, and net profit:

Figure 22: Embraer – Revenue Trend Analysis (R$ Million), 2007–2011



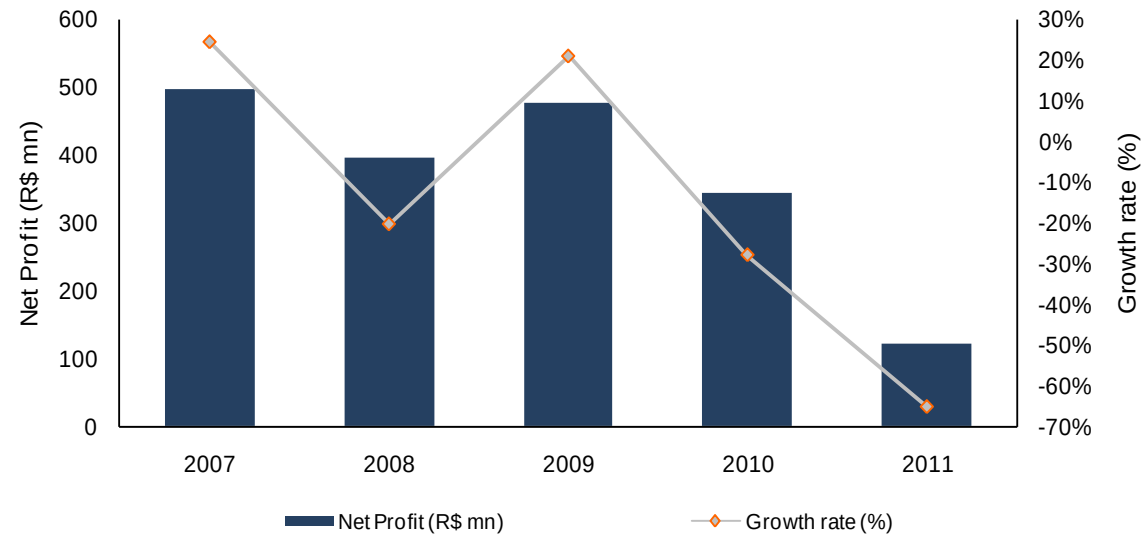
Source: Company website, annual report and SDI analysis

Figure 23: Embraer – Operating Profit Trend Analysis (R$ Million), 2007–2011



Source: Company website, annual report and SDI analysis

Figure 24: Embraer – Net Profit Trend Analysis (R$ Million), 2007–2011



Source: Company website, annual report and SDI analysis

7.2.7. Forjas Taurus SA: overview

Forjas Tauras SA was founded in 1939 and the company designed and produced its first revolver in 1941. Forjas Tauras SA is a manufacturer of firearms, and its subsidiary and affiliated companies produce handguns, motorcycle helmets, large machine tools, tools for construction, mechanical and gardening, and bullet-proof vests. The company's product portfolio includes steel-frame pistols, polymer-frame pistols, revolvers, and law enforcement weapons. Forjas Taurus SA is a leading producer of firearms for professional and personal security in Brazil and abroad, and its products are sold in 70 countries worldwide.

Polimetal Participacoes SA holds an 84% stake in Forjas Tauras SA. The company's subsidiaries and affiliates are Tauras Armas, Tauras Forjados, Tauras Wotan, Tuarasplast, Tauras International, and Famastil. The company has eight manufacturing plants, three of which produce hand guns, three manufacture injected plastic products, one produces machine tools, and one which manufactures forged and machine tools. These plants are located in Rio Grande do Sul, Parana and Miami, Florida. Famastil Tauras SA has four factories located in Gramado, Brazil.

7.2.8. Forjas Taurus SA: products and services

Table15:Forjas Taurus SA– Product focus

Products	Services
Pistols	**NA**
PT 100	
PT 100 Plus	
PT 101	
PT 101 Plus	
PT 138 PRO	
EN 1911	
PT 24 / 7 DAO 40	
PT 24 / 7 9mm DAO	
PT 24 / 7 L D	
PT 24 / 7 PRO 40	
PT 24 / 7 PRO 9mm	
PT 24 / 7 PRO 40 DS	
PT 24 / 7 PRO 9mm DS	
PT 24 / 7 PRO 40 TACTICAL	
PT 24 / 7 PRO 9mm TACTICAL	
PT 24 / 7 TRAINING I	
PT 24 / 7 TRAINING II	
PT 58HC Plus	
PT 59	
PT 609	

Table15:Forjas Taurus SA– Product focus	
PT 609 PRO	
PT 638	
PT 640	
PT 640 PRO	
PT 840	
PT 915	
PT 917	
PT 92	
PT 92 SIMULATION	
PT 938	
PT 940	
PT 945	
PT 99	
Revolvers	
RT 410	
RT 44	
RT 605	
RT 65	
RT 66	
RT 669	
RT 689	
RT 817	
RT 82	
RT 827S	
RT 82S	
RT 838	
TEN 85 IT / Multi-alloy	
RT 851 Multi-alloy	
RT 85S	
RT 85UL	
RT 88	
RT 889	
RT 94	
RT 94 UL	
RT 970	
Rifles	
CP 16”	
CP 20”	

Table15:Forjas Taurus SA– Product focus	
CP 20” MAG	
CP 20” WIN	
CP 24”	
CP 24” LAT	
EP 12	
EP 36/22LR	
Machine guns	
CT 30	
CT 40	
MT 40	
MT 9	
Air rifles	
Rifle 400	
CF-30	
CF-X	
Delta	
Delta Fox	
Hunter-440	
Shadow Matic	
Shadow RSV	
Shadow Sport	
Viper Max	
Viper Skeet	
Source: Annual report, company website, primary and secondary research	© SDI

7.2.9. Forjas Taurus SA: recent announcement and strategic initiatives

2011: The company introduced the 405 model type revolver and the 445 Ultra-Lite model type revolver.

2011: The company introduced the Taurus Tracker 992 model type revolver, equipped with Taurus Ribber Grip and 4–6.5 inch barrel, and which has an overall length of 8.9–11.4 inches.

2011: The company announced that it has won the award Gun of the year 2011 award for its PT 740 model type slim pistol.

2011: The company announced that it would expand its interest in the market of non-lethal weapons, such as pistols and revolvers with rubber bullets.

2011: The company had plants in Brazil and the United States, and featured in the eighth edition of LAAD - Defense & Security.

2010: Taurus introduced 16 new models of long guns at the SHOT Show in 2010.

2009: The company announced a US$9.9 million investment for a new factory. The money will be used to purchase land, buildings, machinery, and equipment. The new facility is expected to create 150 jobs.

2009: Forjas Taurus and Federal Police signed an agreement to facilitate the acquisition of firearms by members of the Metropolitan Civil Guard (GCM) from Sao Paulo, Botucatu, Campinas, Franco da Rocha, Guarulhos, Maua, and Praia Grande.

2008: Forjas Taurus approved the purchase of Metus, a company located in Osasco, Sao Paulo, Brazil. The company manufactures light boiler materials which are widely used by Taurus and its subsidiaries. The deal will increase new technology acquisitions to Forjas Taurus, which traditionally uses heavy boilers.

2008: The Brazilian Minister for Defense announced Forjas Taurus's part in the plan to modernize the national defense industry. The plan is designed to strengthen and improve companies that supply equipment for the Armed Forces. Forjas Taurus agreed to develop new models to meet the requirement of the Armed Forces.

7.2.10. Forjas Taurus SA: alliances

Table16: Forjas Taurus SA– Alliances

Alliances	Partner Company	Year Formed	Strategic Objectives and Focus Area
Partnership	Heckler & Koch	2011	**Product focus**: To provide sales and support of products and accessories, as well as for exchange of technology used to manufacture weapons in Brazil.
Joint venture	Israel Weapons Industries (IWI)	2009	**Product focus**: Forjas Taurus and Israel Weapons Industries (IWI) have entered an agreement to develop the Tavor-21 assault rifle. However, the future of the deal depends on the approval of the Brazilian army. Once the product is approved, both companies will invest US$22 million in a special production line at the factory of Forjas Taurus in Sao Leopoldo.

Source: Company website and SDI analysis © SDI

7.2.11. Forjas Taurus SA: recent contract wins

Table17:Embraer– Recent Contract Wins

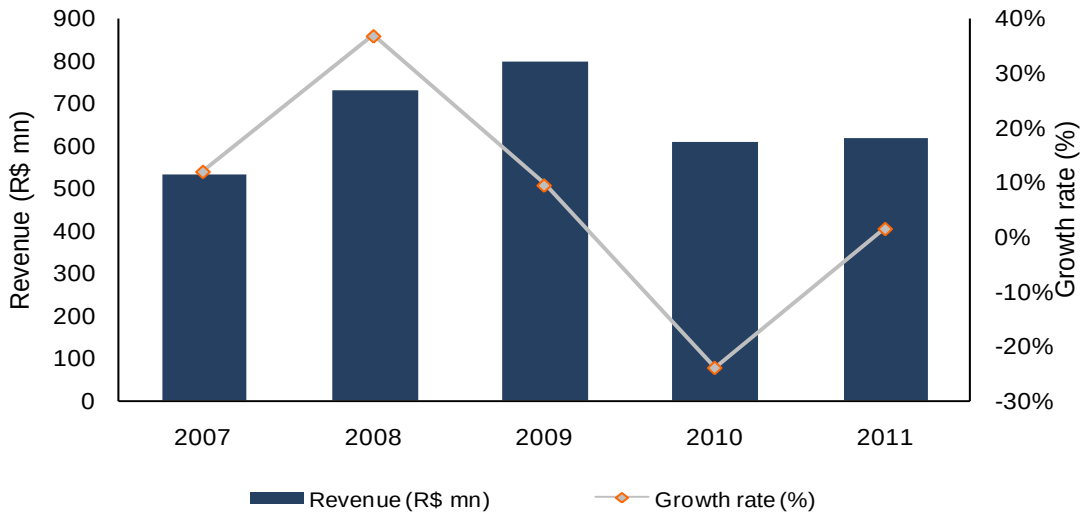
Date	Contract value	Client	Description
Not available	Not available	The Indian Army	Forjas Taurus has won a deal to supply 3070 Tavor rifles to the Indian army, at a cost of US$20 million. The deal is inclusive of spare parts and training of technical personnel.

Source: Company website and SDI analysis © SDI

7.2.12. Forjas Taurus SA: financial analysis

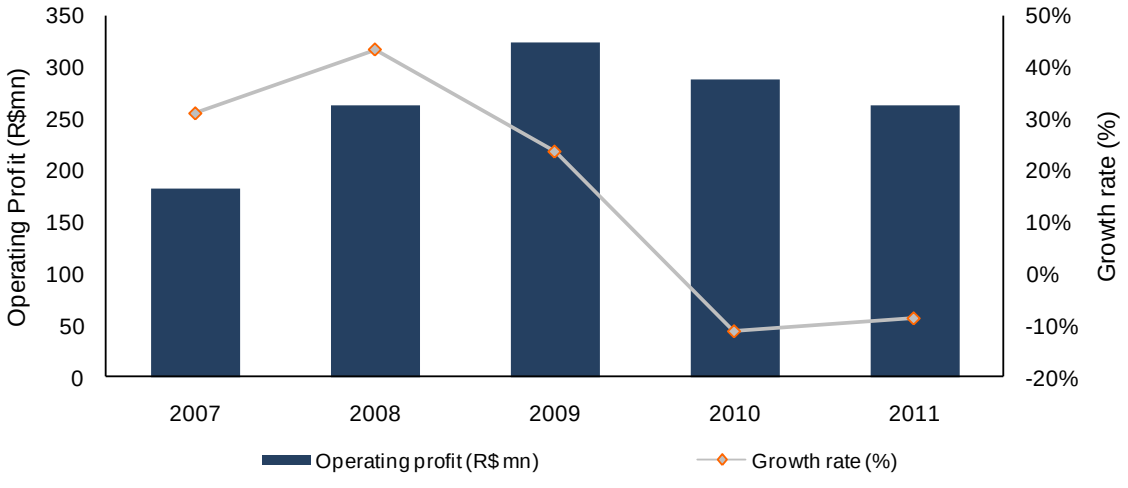
Forjas Taurus SA recorded revenues of BRL618 million (US$371.2 million) in FY2011, and grew at a CAGR of 5.26% during 2007–2011:

Figure 25: Forjas Taurus SA – Revenue Trend Analysis (R$ Million), 2007–2011



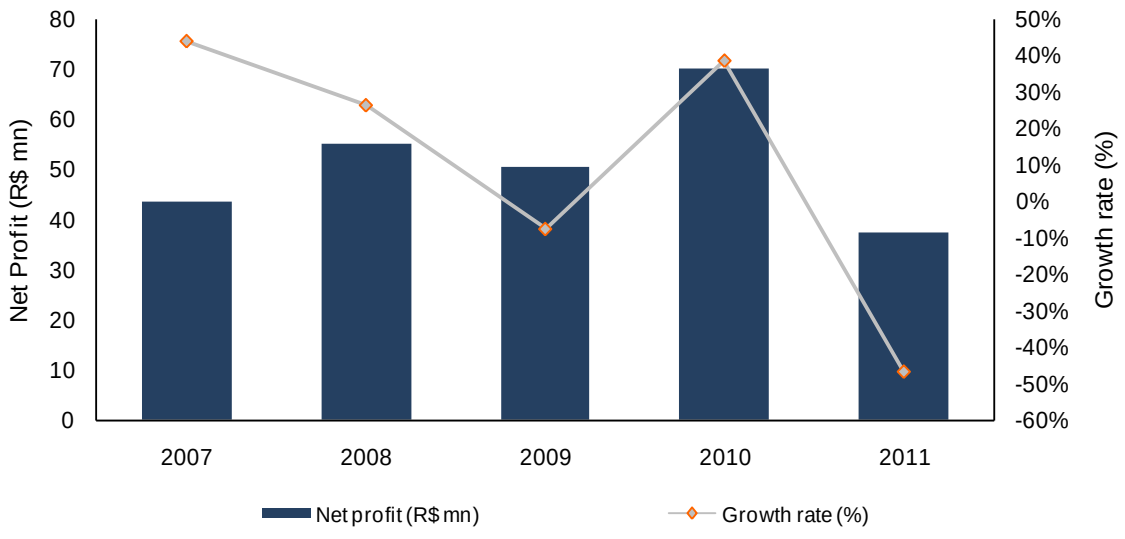
Source: Company website, annual report and SDI analysis

Figure 26: Forjas Taurus SA – Operating Profit Trend Analysis (R$ Million), 2007–2011



Source: Company website, annual report and SDI analysis

Figure 27: Forjas Taurus SA – Net Profit Trend Analysis (R$ Million), 2007–2011



Source: Company website, annual report and SDI analysis

7.2.13. Avibras Industria Aerospacial: overview

Avibras Industria Aerospacial (Avibras) is a Brazilian company which designs, develops, and manufactures defense and civilian products. It provides a range of defense products including air-to-ground and surface-to-surface artillery saturation rocket systems, 70mm air-to-ground systems, and fiber optic multi-purpose guided missiles. It also develops armored vehicles, aircraft defense systems at low altitude, and provides system integration capabilities. Avibras also has extensive operations in electronics, telecommunications, and satellite communications. The company possesses research and development (R&D) expertise, manufacturing, integration, tests, and integrated logistic support for the systems it supplies.

7.2.14. Avibras Industria Aerospacial: products and services

Table18:Avibras Industria Aerospacial– Product focus

Products	Services
Artillery saturation rocket system	**NA**
Astros - II	
HAWK	
Rockets and missiles	
SKY FIRE - 70 air-to-ground rocket system	
FOGTREIN Training Rocket	
FOG - MPM fiber optics guided multiple purpose missile	
AV–TM missile	
Armored vehicles	
AV-VBL 4x4 light armored vehicle	
AV-VB4-RE light armored reconnaissance version	
Unmanned Aerial Vehicles (UAV)	
Aircraft defense at low attitude	
FILA fighting intruders at low altitude	
Simulators	
AV-LMU Universal Multiple Launcher	
AV-UCF Fire Control Unit	
AV-VCC and AV-PCC Command and Control	

Source: Company website and SDI analysis

7.2.15. Avibras Industria Aerospacial: recent announcement and strategic initiatives

2012: The company announced that the assembly of its Falcão model domestic aircraft, which can be used for surveillance, reconnaissance, patrol, and sensor tasks, is expected to be completed shortly.

2009: Avibras received US$9.4 million from the Financier of Studies and Projects (FINEP) in order to develop a UAV with civil and military application in the reconnaissance, environmental monitoring, and inspection of transmission lines for electricity, gas pipes, and urban traffic.

7.2.16. Avibras Industria Aerospacial: alliances

Table19:Avibras Industria Aerospacial– Alliances			
Alliances	**Partner Company**	**Year Formed**	**Strategic Objectives and Focus Area**
Joint development	General Command of Aerospace Technology (CTA), Technological Centre of the Army(CTEx),Research Institute of Navy	2005	**Product focus:** Avibras acted as an industry partner of a consortium developed to produce Brazil's first UAV. The UAV development is an entirely domestic project which utilizes only Brazilian technology. The UAV is expected to conduct civilian and military operations.
Licensed production	Sukhoi	2002	**Product focus**: Avibras Aerospacial signed a deal with Sukhoi for the production of its military and civil aircraft. The agreement is linked to Sukhoi's bid for the Brazilian air force's US$700 million F-X BR fighter program. This allowed Sukhoi to meet the requirement of becoming associated with a domestic manufacturer to supply the required aircraft.
Source: Company website and SDI analysis			© SDI

7.2.17. Avibras Industria Aerospacial: recent contract wins

Table20:Avibras Industria Aerospacial– Recent Contract Wins			
Date	**Contract value**	**Client**	**Description**
2007	Not available	Undisclosed	Avibras signed a US$500 million contract with an undisclosed customer in Asia. The deal required Avibras to provide rockets, Astros - II rocket launchers, launch systems, and support units.
Source: Company website and SDI analysis			© SDI

7.2.18. Companhia Brasileira de Cartuchos: overview

Companhia Brasileira de Cartuchosis one of the largest military and commercial ammunition manufacturers in the world and has 81 years of experience in the manufacture of small- and medium-caliber ammunition. The company is privately owned, with ArbiInvestment as its principal shareholder. CBC acquired the German plant Metallwerke Elisenhutte Nassau (MEN) in 2007, and the Czechcompany Sellier and Bellot in 2009.The company has two manufacturing units, in Sao Paulo and Rio Grande do Sul. The Sao Paulo unit, Ribeirão Pires, is spread over 500 acres, with a 377,000-square-feet building area. The facility contains ammunition, propellant powder, and primer composition manufacturing operations and central offices. The Rio Grande do Sul unit produces fire arms and shot-shells. CBC has 1,200 employees and annually produces 415 million rounds of ammunition.

The company carries out its distribution though the Brazil CBC distribution center. All commercial cartridges made by CBC are sold under the brand Magtech, and are exported to 50 countries through its two distribution centers in Minneapolis, the US, and Hamburg, Germany. The company exports 70% of its total ammunition production and 80% of its firearms to countries across the world.

The company produces a variety of cartridges for commercial and military use, including center fire and rim fire ammunition for small and medium calibers ranging from .22LR to 30 mm, for shotguns and rifles for both the civilian and military markets. The company supplies cartridges to the Brazilian Armed Forces, and a number of military forces worldwide. Caliber handgun ammunition accounts for the majority share of the company's production.

7.2.19. Companhia Brasileira de Cartuchos: products and services

Table21:Companhia Brasileira de Cartuchos– Product focus

Products	Services
Military arsenal	**NA**
9 x 9 mm Parabellum	
5.56 x 45 mm	
7.62 x 51 mm	
12.7 x 99 mm (.50)	
12.7 x 76 mm (.50)	
20 x 102 mm	
20 x 110 mm	
20 x 128 mm	
30 x 113 mm	
Ammunition	
Pistol ammunition	
Handgun ammunition	
Gold ammunition	
Ammunition copper bullets	
Hunting cartridges	
Cartridges competition	

Table21:Companhia Brasileira de Cartuchos– Product focus	
Cartridges for police use	
.22 ammunition	
Rifles and ammunition for machine guns	
Ammunition for cannons	
Cartridges for industrial use	
Fuses	
Cases	
Projectiles	
Powders	
Weapons	
Pump CBC 12	
Rifle CBC 199	
Rifle CBC 7022	
Vests	
Aramida	
NFT (new fibers technology)	
Gold flex	
Polyethylene	
Spectra shield	
Dyneema	
Spectra flex	
Multi-vest threat CBC	
30 x 113 mm	
Source: Company website and SDI analysis	© SDI

7.2.20. Companhia Brasileira de Cartuchos: recent announcement and strategic initiatives

2011: The company announced that it has introduced new technology for military ammunition to be used by the armed forces.

2010: The company participated in the space Magnum Show - VI International Exhibition of Arms, Ammunition, Knives and Accessories to showcase its product line including cartridges, ammunition, guns, rifles, and ballistic pressure vests.

2009: CBC acquired Sellier & Bellot, a traditional manufacturer of ammunition for small arms for civilian, military, and police use. The company is located in the city of Vlasim, in the Czech Republic. This acquisition was part of the acquisition program started by CBC in the 1990's. The company exports to over 70 countries with its major customers located in European region.

2009: CBC's subsidiary, Metallwerke Elisenhutte Nassau (MEN), received certification for completely lead-free law enforcement ammunition.

2007: CBC acquired Metallwerke Elisenhutte Nassau (MEN) and celebrated 50 years of business operations. MEN is a renowned company in the European market with its advanced technology and high-quality products. The company is located in Nassau, Germany and manufactures military and police ammunition for the armed forces and for several European countries' police forces.

2007: The company inaugurated Brazil CBC distribution center in the capital Sao Paulo'sAnhanguera Highway. The distribution center aims to improve services to the customers of CBC and assist business expansion.

7.2.21. Companhia Brasileira de Cartuchos: recent contract wins

Table22: Companhia Brasileira de Cartuchos (CBC)– Recent Contract Wins

Date	Contract value	Client	Description
2010	Not available	Police Forces of all Nordic countries	To supply 9x19mm ammunition for police forces from Nordic Countries, including Sweden, Denmark, and Norway.
2009	US$2 million	Philippines Army	CBC won a contract for the supply and delivery of new ammunition for the armed forces of Philippines. The contract was worth US$2 million.

Source: Company website and SDI analysis © SDI

7.2.22. Helibras: overview

Helibras is a wholly owned subsidiary of the European Aeronautic Defence and Space Company(EADS), and is a leading turbine helicopter manufacturer in the Brazilian market, with a 54% stake in the civilian market and a 66% share in the military market. It is also responsible for the assembly, sales, and after sales support of Eurocopter helicopters in Brazil.

Helibras is one of the top two manufacturers of helicopters in Latin America. The Itajuba Helibras factory is an ISO 9001:2000 certified manufacturing unit, and the company owns a 3,800-square-meter shopping area, parts warehouse, and workshop, which allows the company to serve its fleet more efficiently. The company produces and delivers squirrel model helicopters, which account for 70% of its total helicopter production. Helibras also exports helicopters to countries such as Argentina, Bolivia, Chile, Mexico, Paraguay, Uruguay, and Venezuela.

7.2.23. Helibras: products and services

Table23:Helibras– Product focus

Products	Services
Helicopters	**NA**
Hummingbird EC 120B	
Fennec AS 550 C3	
Fennec EC 130 B4	
Fennec AS 555 NS, UN / NA	
EC 635 P2/T2	
Panther AS 565 UB / MB	
Cougar AS 532 AL / SC	
EC 725	
Tiger HAP / HCP	
NH 90	
Source: Company website and SDI analysis	© SDI

7.2.24. Helibras: recent announcement and strategic initiatives

2012: The company announced that itwill be demonstrating the Eurocopter X^3 (X-Cubed) model helicopter based on the concept of H^3(Helicopter Hybrid high speed and long range) to the US Army, and these helicopters will be evaluated for performance.

2012: Helibras announced the opening of a new US$300 million extension to its Helibra's Itajuba facility set up for assembly of the EC725 model helicopters.

2011: Helibras' AS350 squirrel helicopters will have a choice of modern avionics and displays produced in Brazil.

2010: The company delivered 31 helicopters during FY2010 and increased service revenues by 37%.

2010: Helibras inaugurated a new production unit in Itajuba, Brazil. The new unit will ensure that the company doubles both its installed production capacity and the number of jobs in the location. The unit

will produce the EC725 helicopter, and will supply 50 of these helicopters to the Brazilian armed forces. Helibras announced that the unit will be operational in 18 months. The Itajuba plant is spread across 11 thousand square meters, and will accommodate the assembly line of EC725 helicopters and provide manufacturing and administrative offices, maintenance facilities, and program management.

2009: Helibras and Eurocopter announced the development of an EC-725 helicopter flight simulator, which will be based in Rio de Janeiro, Brazil. The simulator will enable the training of navy, army, and air force pilots. It is designed to recreate the cockpit and missions of the EC-725 aircraft, in order to recreate complex missions and enhance flight safety. The deal value was reported to be worth US$1.2 billion.

7.2.25. Helibras: alliances

Table24:Helibras– Alliances

Alliances	Partner Company	Year Formed	Strategic Objectives and Focus Area
Cooperation agreement	Sagem Aeroelectronica	2010	Strategic Focus: To jointly develop new solutions in avionics to modernize the dashboard of the AS350 Squirrel.
Technical collaboration	ATE	2007	Product focus: Helibras and ATE signed a technical cooperation agreement concerning helicopter program activities. According to the agreement, both companies will complement their expertise in Brazil in the field of military helicopter modernization and acquisition programs that require specific and complex system development and integration.

Source: Company website and SDI analysis © SDI

7.2.26. Helibras: recent contract wins

Table25:Helibras– Recent Contract Wins

Date	Contract value	Client	Description
2011	Not available	Brazilian Army Aviation	Helibras signed a contract with the Brazilian Army Avition to modernize 36 AS 350 Ecureuil model helicopters.
2010	Not available	National Secretariat of Public Security of the Ministry of Justice and the Government of Bahia	Acquisition of Multi-Squirrel helicopters by the military police of Bahia.
2010	Not available	Brazilian Army	To modernize its fleet of 34 AS365K Pantera.
2009	Not available	Brazilian Army Aviation	Helibras signed a contract with the Brazilian Army Aviation to modernize 34 AS365K Pantera helicopters. The contract includes the installation of new engines with increased power, new avionics navigation, and radio communication. Delivery will commence in 2011 and be completed by 2021, at a rate of four helicopters per year. This was the biggest contract win in the service area for the company in 30 years.
2008	Not available	Brazilian Government	The Brazilian government has signed a contract with the consortium formed by Helibras and Eurocopter for

Table25:Helibras– Recent Contract Wins			
			the procurement of 50 EC725 helicopters. The first deliveries of this aircraft are scheduled for 2010 and will be operated by the Brazilian armed forces. This contract expands the market of Eurocopter in South America.
Source: Company website and SDI analysis			© SDI

7.2.27. Helibras: financial analysis

Helibras registered an annual turnover of €123.8 million (US$ 163.27) in the year 2011 the company registered record revenue of US$357 million in 2009. The company also registered a 19% growth in deliveries in comparison to 2008. In 2009, 31 helicopters were delivered by the company, compared to 26 in 2008. Helibras also recorded a growth of 25% in the service sector, with service sector operations worth US$39 million in 2009, compared to US$31 million in 2008.

A contract to deliver 50 EC725 helicopters to the Brazilian Armed Forces fueled the company's increase of sales revenue in 2009. An additional contract for five AS350 squirrel helicopters to be supplied to the Sao Paulo military police also assisted in revenue increase.

7.2.28. Industria de Material Belico do Brasil (IMBEL): overview

Industria de Material Belico do Brasil (IMBEL) is a company under the jurisdiction of the Ministry of Defense through the Brazilian Army. It produces small arms, ammunitions, explosives, ammunition components, and communication and electronic equipment. It also trains engineering graduates through the Military Institute of Engineering. Its considerable experience in manufacturing has assisted the company's creation and upgrading of proprietary technology and the development of a more varied range of civilian goods.

In order to meet its production requirements, the company operates five factories: Fábrica Presidente Vargas (FPV), the Star Factory (FE), Fabrica de Juiz de Fora (FJF), Factory Itajuba (FI), and Factory Communications and Electronics Equipment (FMCE). IMBEL has established partnerships with the Springfield Armory in the US, EADS, Camargo Correa, EMGEPRON, and VALE.

7.2.29. Industria de Material Belico do Brasil (IMBEL) : products and services

Table26:Industria de Material Belico do Brasil (IMBEL)– Product focus

Products	Services
Rifles	**NA**
5.56 mm rifles and carbines	
7.62 rifle M964 A1 - PARAFAL	
7.64 M964 rifles	
Rifle .308 AGLC	
Pistols	
.45 Pistols M911A1	
GC .45 pistols	
GC .40 pistols	
9 Gun M973	
Pistol .380 GC	
.380 Pistols	
Communications and electronics	
Computer Palmar Military CPM1220	
Telephone UNA 2000	
Radio Transceiver TRC 1193 MALLET	
Explosives	
Friction lighters	
Lighter percussion - STAR	
Anfo/Carbonitrato	
Load breaker – Rompel	
COMPOSITIONS B, A3, A4 and A5	
Detonating cord – BELCORD	
Nitroglycerin dynamite	

Table26:Industria de Material Belico do Brasil (IMBEL)– Product focus	
Emulsion explosive	
Fuze beldeton	
Espoletim Star	
Hydraulic fuse - BELPIM	
Ethyl ether	
Gelatin explosive	
HMX (octogen)	
Nitrate Monoethanolamine	
Nitrocellulose	
Nitrocellulose Collodion	
Nitropenta (PETN)	
Small firecrackers	
Plastex	
Black powder	
Double-base powders	
Single-base powders (powders Hunting)	
RDX (hexogen)	
Reinforcer (Booster) - Belex	
Delay Belmaker	
Simulacrum of Granada	
Trinitrotoluene (TNT)	
Munitions components	
In Ex-Head 70 M1	
War Head AC-70	
War Head 70-AP	
Fuze for warhead and percussion - EOP EE 1105	
Percussion fuse for warhead and EOP M3 A1	
Percussion fuse for warhead and EOP M6 A1	
Estopilha IMBEL 2494	
Estopilha IMBEL 2517 A2	
Estopilha IMBEL M1A2	
Estopilha IMBEL M1A3	
Estopilha IMBEL MD3	
Estopilha IMBEL MD4	
Estopilha IMBEL MD7	
Estopilha IMBEL MD8	
Propellant grain and Tracer	
Motor maroon SBAT 70	

Table26:Industria de Material Belico do Brasil (IMBEL)– Product focus	
Munitions	
Rocket SBAT M4B1-70, w / cab Ex In M1	
70-maroon SBAT M4B1 c / cab 70AP	
Maroon SBAT-70 M4B1, c/cab.70AC	
Shot Saves 105 M 395	
Shooting 105 AE - IMBEL MD1 A1	
Shooting AE 120 CONV	
Shooting 120 AE PR	
Shooting 120 AE PRPA	
Shooting 40 L/60 Tr Lst M1	
Shooting SR 57 AE - IMBEL MD1	
Shooting SR 57 Lst - IMBEL MD1	
Shooting 75 Saves	
Tire 90mm (HEAT-T) TP-T	
Shooting 90mm HE-T	
Shooting 90mm HEAT-T	
Shooting 90mm HESH-T	
Shooting 90mm Smoke WP-T	
Mortar shot 60 AE M1 A1	
Mortar shot 60 AE A1 M2	
Mortar shot 81 AE M1 A1	
Mortar shot 81 AE M2	
Source: Company website and SDI analysis	© SDI

7.2.30. Industria de Material Belico do Brasil (IMBEL): recent announcement and strategic initiatives

2012: The company participated in the 2012 Feria Internacional del Airey del Espacio (FIDAE) exhibition to showcase the IA2 model rifles and assault rifles.

2011: The company demonstrated itsradio mallet device, used in military, to the department of Science and Technology.

2011: IMBEL was developing an Evacuation System (SATI).

2010: IMBEL was seeking to develop its product line through the replacement of the IMBEL MD-2 service rifles (MD-3 and MD-4) variants. These may be replaced by FN-SCAR or the IWI Tavor**.**

7.2.31. Industria de Material Belico do Brasil (IMBEL): alliances

Table27:Industria de Material Belico do Brasil (IMBEL)– Alliances

Alliances	Partner Company	Year Formed	Strategic Objectives and Focus Area
Memorandum of Understanding (MoU)	EID	2011	**Product focus:** A co-operation agreement was signed between IMBEL and EID (Portugal) to locally produce the Integrated Communication Control System (ICCS) components for Brazilian navy warships.
IMBEL to provide communication systems	Iveco	2009	**Product focus**: IMBEL agreed to provide communication systems for VBTP-MR armored vehicles for the transportation of personnel. This is part of the agreement between the Brazilian army and Iveco to supply 2,044 vehicles.
Memorandum of Understanding (MoU)	Rippel Effect Weapon Systems	2007	**Product focus:** A memorandum of understanding was signed between IMBEL and the South African private sector defense enterprise Rippel Effect Weapon Systems for the manufacture of Rippel's 40mm multi-shot grenade launcher in the South American market.
Partnership	EADS	2004	**Product focus:** IMBEL partnered EADS to produce armored PATRIA, targeting the foreign market.

Source: Company website and SDI analysis © **SDI**

7.2.32. Industria de Material Belico do Brasil (IMBEL): recent contract wins

Table28:Industria de Material Belico do Brasil (IMBEL)– Recent Contract Wins

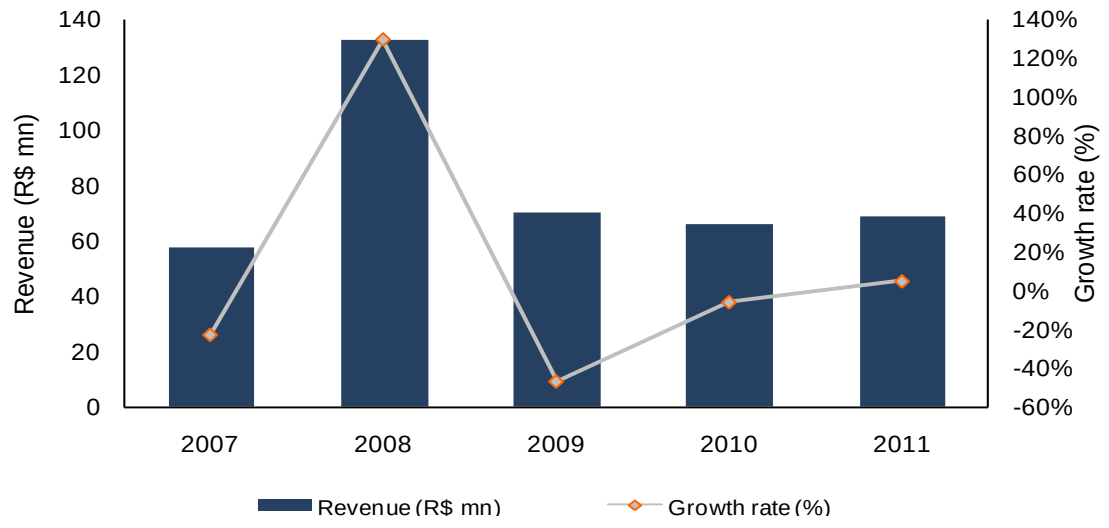
Date	Contract value	Client	Description
2004	US$9.2 million	The government of Minas Gerias	The government of Minas Gerias signed an agreement with IMBEL for the supply of weapons to the military and city police for 10 years. This will assist IMBEL in clearing its debt ofUS$9.2 million.
1999	US$20 million	Venezuela	Imbel won the contract for the modernization of military rifles in Venezuela. The contract was worth US$20 million and the company was required to provide this service from 2000–2001.

Source: Company website and SDI analysis © **SDI**

7.2.33. Industria de Material Belico do Brasil (IMBEL): financial analysis

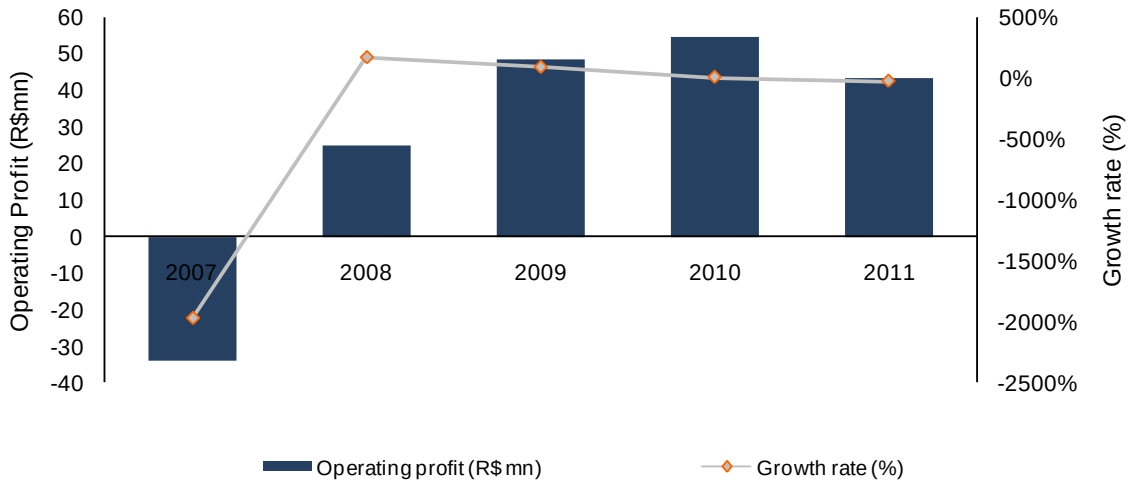
IMBEL recorded revenues of BRL69.1 million (US$41.5 million) during FY2011, and declined at a CAGR of -1.69% during 2007–2011.

Figure 28: Industria de Material Belico do Brasil (IMBEL) – Revenue Trend Analysis (R$ Million), 2007–2011



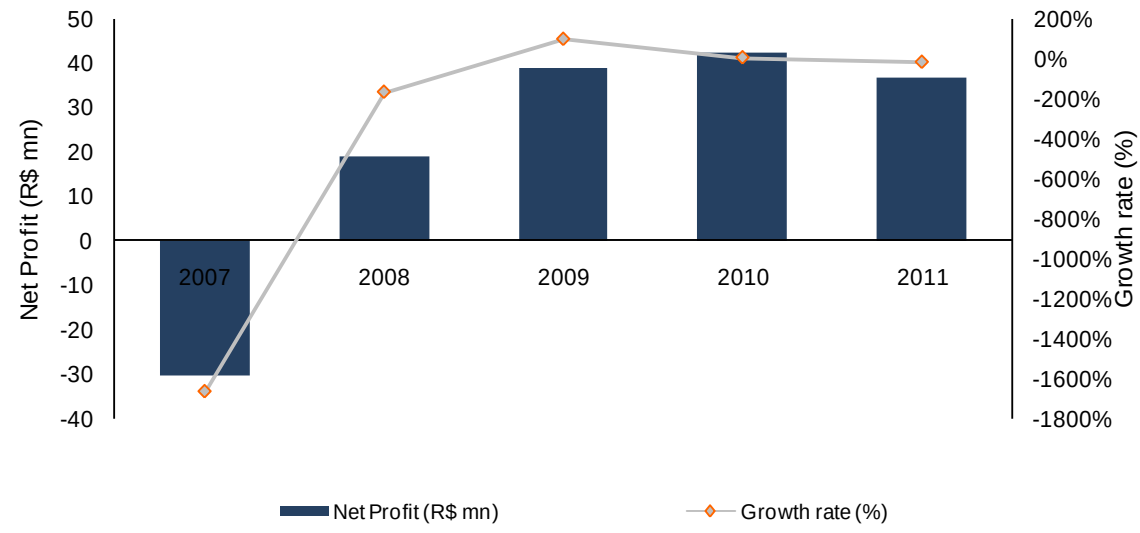
Source: Company website, annual report and SDI analysis

Figure 29: Industria de Material Belico do Brasil (IMBEL) – Operating Profit Trend Analysis (R$ Million), 2007–2011



Source: Company website, annual report and SDI analysis

Figure 30: Industria de Material Belico do Brasil (IMBEL) – Net Profit Trend Analysis (R$ Million), 2007–2011



Source: Company website, annual report and SDI analysis

7.2.34. Aeroelectronica: overview

Aeroelectronica is a Brazilian company involved in the design, development, qualification, manufacture, maintenance, and logistical support for military and civil electronic products with application in aircraft, waterborne craft, and motor vehicles. Elbit Systems Ltd., one of the largest defense companies in Israel, acquired a controlling stake of Aeroelectronica in 2001. The company's quality management system conforms to NBR ISO 9001:2008 and NBR 15100:2004 standards and is also certified by the Brazilian Aeronautical Authority. It also carries a qualification from the Aeronautic and Military Materials Board, DIRMAB, and the Military Aviation Materials Board, DMAvEx.

7.2.35. Aeroelectronica: products and services

Table29:Aeroelectronica– Product focus

Products	Services
F-5 modernization	**NA**
AAP - Avionics activation panel	
MC - Mission computer	
ARB - Armament relay box	
HUD - Head up display	
DVR - Data video recorder	
SIU - Station interface unit	
CMFD - Color multi-function display	
A-1 avionics	
GEU (SAHRS) - Gyro electronic unit	
CP (RECCE 3) - Control panel for reconnaissance	
ADI - Altitude director indicator	
CP (RECCE 1/2) - Control panel for reconnaissance system pallet ½	
HUD - Head up display	
MDU - Magnetic detector unit	
SWAH - Signal warning audible for the headset	
HSI - Horizontal situation indicator	
GCU - Generator control unit	
MDU (SAHRS) - Magnetic detector unit	
CTA - Current transformer assay	
CCTVS - Color cockpit TV senso	
CP (V/UHF 2) - Control panel of V/UHF #2	
RIFU - Aerial reconnaissance system interface computer	
CP (V/UHF 1) - Control panel of V/UHF #1	
CP (SAHRS) - Control panel of the standby attitude heading reference system	
EPCU - External power control unit	

Table29:Aeroelectronica– Product focus	
V/UHF - Transceiver V/UHF	
T27 avionics - Aeroelectronica has developed, manufactured and provides maintenance	
PTR - Radio transference panel	
USV - Voltage sensor unit	
UAS - Sound alarm unit	
CRA - Armament relay box	
UAB - HDG tray adaptor box	
PCA - Armament command panel	
CTR - Radio transference box	
TAC - Alarm temporizer of low level fuel	
PRA - Armament repeater panel	
UCT - Temperature control unit	
ISA - Armament system intervalometer	
A-29 Super Tucano Avionics	
DVR - Data video recorder	
MDP - Mission display processor	
SIU - Station interface unit	
CMFD - Color multi -function display	
Source: Company website and SDI analysis	© SDI

7.2.36. Aeroelectronica: recent announcement and strategic initiatives

2010: The company announced the installation of a center for the development and manufacture of UAVs in Brazil. The initiative is in accordance with the Brazilian government's aim to develop and understand this technology domestically, and it also meets the intent of Air Force Command to acquire UAVs for the use of the Brazilian Air Force.

2009: Aeroelectronica is one of the nine companies that received a request for information (RFI) from the Brazilian Air Force for the acquisition of a UAV. The UAV will be used in reconnaissance missions and as a communications relay platform.

7.2.37. Aeroelectronica: alliances

Table30:Aeroelectronica– Alliances			
Alliances	**Partner Company**	**Year Formed**	**Strategic Objectives and Focus Area**
Partnership	Raytheon Corporation	2011	**Product focus:** To provide cables, harnesses, and wiring for defense systems and defense mechanisms**.**
Source: Company website and SDI analysis			© SDI

7.2.38. Aeroelectronica: recent contract wins

Table31:Aeroelectronica– Recent Contract Wins

Date	Contract value	Client	Description
2009	Not available	The Brazilian Army	The company was selected to integrate the new armored vehicle personnel carrier for the Brazilian Army VBTP-MR 6×6 of Iveco, a remotely controlled weapon system.

Source: Company website and SDI analysis © SDI

7.2.39. Indústria Naval do Ceará: overview

Indústria Naval do Ceará (INACE), located in Fortaleza, Brazil, is a mid-sized shipyard involved in the construction and repair of ships, primarily steel and aluminum luxury yachts and warships. The range of vessels manufactured and repaired by INACE includes fishing boats, tug boats, towboats, barges, offshore support vessels, luxury yachts, and patrol craft. The company also manufactures marine parts and accessories.

7.2.40. Indústria Naval do Ceará: products and services

Table32:Indústria Naval do Ceará– Product focus

Products	Services
Naval patrol vessels	**NA**
Guanabara	
Guarujá	
Brendan Simbwaye	
NAPA 500	
Naval fast patrol boats	
Aviso Patrulha Dourado	
Barracuda	
Marlim	
Steel landing craft mechanized (LCM) - (EDVM 25 Class)	

Source: Company website and SDI analysis © SDI

7.2.41. Indústria Naval do Ceará: recent announcement and strategic initiatives

2010:INACE delivered a first-class patrol boat called Macaéfor the Brazilian Navy.

2009: INACE delivered the Warning Patrol Golden model boat to the Brazilian Navy to be used in the service of marine patrol in ocean areas off the Brazilian coast.

7.2.42. Indústria Naval do Ceará: recent contract wins

Table33: Indústria Naval do Ceará– Recent Contract Wins

Date	Contract value	Client	Description
September 2009	US$1.4 million per unit	The Brazilian Navy	The company supplied warning patrol boats to the Brazilian Navy for the patrol of ocean areas off the Brazilian coast. The boat has the capability to transport six crew members and to displace 45 tons with a full tank.It can operate unmanned and reach speeds of up to 27 knots.
June 2009	Not available	The Brazilian Navy	The company entered an agreement with the Brazilian Navy to construct 12 naval patrol boats in Fortaleza, with funding available for a further six boats. The shipyard also produced two NAPA 500s naval petrol craftfor US$38 million each.

Table33: Indústria Naval do Ceará– Recent Contract Wins			
January 2009	Not available	The Namibian Navy	The company sold a patrol boat to Namibia, the first naval vessel ever produced in Brazil for an African country.
Source: Company website and SDI analysis			© SDI

7.2.43. Northrop Grumman: overview

Northrop Grumman Corporation (Northrop Grumman) is a defense and aerospace technology company based in the US. It was formed in 1994 following the purchase of Grumman by Northrop. The company is one of the largest defense contractors in the world and the largest naval vessels construction company. The company operates five business units: information and services, electronics, aerospace, shipbuilding, and technical services. The electronics unit produces a large variety of advanced defense electronics and systems. The company also manufactures marine parts and accessories.

7.2.44. Northrop Grumman: products and services

Table34: Northrop Grumman– Product focus

Products	Services
Navigation systems	**NA**
Navigation systems for NAPA 500-ton patrol boats	
Navigation radars	
Integrated bridge systems (IBS)	
Heading and speed sensors	
Mission data recorder	
Steering control	
Echo sounders	
MK27F and MK39 ship inertial navigation systems (INS)	
MK 27F fiber-optic attitude and heading reference systems	
Communication systems	
Air traffic communication systems	
Multi-role electronically scanned array (MESA) airborne early warning system	
PAE T6 and PAE M7 multi-mode digital radios	
UAVs	
Fire scout vertical take-off and landing UAVs	
Naval system	
APN-241 radar and the International Patrol Frigates	

Source: Company website and SDI analysis © SDI

7.2.45. Northrop Grumman: recent announcement and strategic initiatives

2011: The company announced that it participated in the Latin America Aerospace and Defence (LAAD) 2011 exhibition held in Rio de Janeiro, and showcased its defense and security capabilities such as marine navigation, communications, command and control, and unmanned aerial systems

2009: The Sperry Marine business unit of Northrop Grumman secured a contract to supply the Brazilian Navy with advanced navigation systems for four new NAPA 500-ton patrol vessels, with the option of six additional vessels. Sperry Marine will supply integrated bridge systems based on its new-generation Vision Master FT navigation technology, including Vision Master FT consoles, an electronic chart display and information system, navigation radars, heading and speed sensors, echo sounders, steering control, mission data recorder, and other sub-systems.

2009: Northrop Grumman participated in the 2009 Latin America Aerospace and Defense (LAAD) show in Rio de Janeiro, Brazil, where it showcased a wide range of naval and airborne products. Its showcased products included naval shipboard technologies, shipbuilding, airborne radars, unmanned aerial vehicles (UAV) and air traffic communication systems.

7.2.46. Northrop Grumman: alliances

Table35:Northrop Grumman– Alliances

Alliances	Partner Company	Year Formed	Strategic Objectives and Focus Area
Memorandum of Agreement (MoA)	GNS Industry and Trade and RCS Precision Machining and Maintenance	2012	**Product focus:** To explore work packages useful for precision-machined aluminum components and subassemblies to be used for aerospace and defense machining work.

Source: Company website and SDI analysis © SDI

7.2.47. Northrop Grumman: recent contract wins

Table36:Northrop Grumman – Recent Contract Wins

Date	Contract value	Client	Description
September 2009	Not available	The Brazilian Navy	The Sperry Marine business unit of Northrop Grumman signed a contract to supply the Brazilian Navy with advanced navigation systems for four new NAPA 500-ton patrol vessels, with options for six additional vessels.
April 2009	Not available	The Brazilian Navy	Sperry Marine business unit of Northrop Grumman has been awarded contracts to supply state-of-the-art navigation systems for two new 500-ton patrol boats for the Brazil navy.
March 2009	US$19 million	CISCEA	Park Air Systems, a European air traffic control systems subsidiary of Northrop Grumman, secured a contract with the Brazilian Airspace Control System Implementation Commission (CISCEA) to supply and install the complete UHF/VHF T6 extended range communication stations at multiple sites across Southern Brazil.

Source: Company website and SDI analysis © SDI

7.2.48. EADS Brazil: overview

European Aeronautic, Defense & Space Co (EADS) is a Dutch company that specializes in aerospace, defense, and related services. The company is organized into four divisions: Airbus Commercial, which manufactures and markets commercial jet aircrafts, Airbus Military, which produces and sells military transport aircraft and special mission aircraft, Eurocopter, which specializes in the production, maintenance, and marketing of civil and military helicopters, and the defense and security division, which produces and sells missile systems as well as military combat and training aircraft. EADS also provides defense electronics, training, testing, and engineering services. EADS has 30 years of experience in the aerospace and defense market in Brazil.

7.2.49. EADS Brazil: products and services

Table37:EADS Brazil– Product focus

Products	Services
Rotorcrafts	**NA**
EC725 aircraft	
HU-14 Super Pumas	
UH-12/13 Fennecs/Esquilos	
Eurocopter HM1 Panthers	
Air force H-34 Super Pumas	
H-50 Esquilos	
Cougar helicopters	
Aircrafts	
C-295 military transport planes	
Defense electronics	
DE avionics equipment	
Support systems	
Radars and warning systems	
Missile interference	
Data link systems	
Digital maps	
Defense and communication systems	
LSI (Large System Integration)	
C3I project	
Missile systems	
Exocet	
Sea Skua missiles	
Anti-ship Seawolf Albatros	
MBDA Mistral MANPAD	

Source: Company website and SDI analysis © SDI

7.2.50. EADS Brazil: recent announcement and strategic initiatives

2011: The company announced that the Brazilian Ministry of Defense successfully accepted the delivery of the first P-3 Orion model type aircraft modernized by Airbus Military, an EADS company.

7.2.51. EADS Brazil: alliances

Table38: EADS Brazil– Alliances

Alliances	Partner Company	Year Formed	Strategic Objectives and Focus Area
Cooperative agreement	Eurocopter and BioCombustibles del Chubut	June 2010	**Strategic focus:**The creation of an aviation biofuel production facility in Brazil.
Long-term joint venture deal	Odebrecht	May 2010	**Market focus:** The company agreed to form a joint venture with Odebrecht to target the Brazilian defense and security market. The joint venture intends to address the defense and security market in Brazil and other countries where potential collaborations can be identified between the two companies.

Source: Company website and SDI analysis © SDI

7.2.52. EADS Brazil: recent contract wins

Table39: EADS Brazil– Recent Contract Wins

Date	Contract value	Client	Description
January 2010	Not available	The Brazilian Armed Forces	EADS's subsidiary, Helibras, signed a contract for the modernization of 34 AS365K Pantera helicopters for the Brazilian Army Aviation. The contract includes the installation of new engines with increased power, new avionics navigation, and radio communication. The aircraft will be developed into next-generation helicopters with an additional 25 years of service.
December 2008	US$2.7 billion	The Brazilian Armed Forces	EADS, through its subsidiary Eurocopter, signed an order for 50 military helicopters from Brazil. Eurocopter, and EADS's Brazilian subsidiary Helibras, will produce the EC725 aircraft in Brazil and will commence delivery to the Brazilian Armed Forces from 2010. The contract is expected to double the production capacity and the number of staff at Helibras plant in Itajuba, in the Brazilian state of Minas Gerais.
December 2007	Not available	The Brazilian Air Force	A consortium, formed by EADS's subsidiaries Eurocopter and Helibras, signed a contract with the Brazilian government for the local production of 50 EC-725 military transport helicopters in Brazil. The 50 EC-725 helicopters will be produced in a variety of versions and configurations for the Army Aviation, the Naval Aviation, and the Air Force.

Source: Company website and SDI analysis

7.2.53. Lockheed Martin: overview

Lockheed Martin Corporation (Lockheed Martin) is involved in the research, design, production, integration, and sustainment of advanced defense systems and products. The company was formed in 1995 through the combination of Lockheed Corporation and Martin Marietta Corporation. The company operates in four business segments: aeronautics, electronic systems, information systems and global services, and space systems. Its defense products are manufactured by the company's electronic systems business division. The company is involved in defense operations with a number of countries, including Brazil. Lockheed Martin offers Brazil a range of defense products and services which include aircraft, radars, combat systems, logistics support, and training.

7.2.54. Lockheed Martin: products and services

Table40: Lockheed Martin– Product focus

Products	Services
Combat systems	**NA**
Open-architecture combat system for submarines	
Sonar and fire control	
Weapons launch systems	
Radar systems	
Long-range 3D radars	
The vigilance of the Amazon (SIVAM) B-34 radar	
Aircrafts	
C-130 transport aircraft	
P-3 Orion maritime surveillance aircraft	
Source: Company website and SDI analysis	© SDI

7.2.55. Lockheed Martin: recent announcement and strategic initiatives

2011: The company announced that its integrated combat system, which is used on the SS Tapajo U209 model type of Tupi-class submarine, was tested by the Brazilian Navy.

7.2.56. Lockheed Martin: alliances

Table41: Lockheed Martin– Alliances

Alliances	Partner Company	Year Formed	Strategic Objectives and Focus Area
Teaming agreement	Atmos Sistemas Ltda	April 2011	**Product focus**: To pursue the Brazilian Air Force's future 3-D long-range radar procurement program, which seeks to upgrade and enhance air space control over South America's largest country.
Source: Company website and SDI analysis			© SDI

7.2.57. Lockheed Martin: recent contract wins

Table42:Lockheed Martin– Recent Contract Wins

Date	Contract value	Client	Description
April 2009	US$1.6 million	The Brazilian Air Force	Lockheed Martin received a contract from the Brazilian Air Force to support six of its TPS-77 long-range air surveillance radars, which are currently monitoring airspace in the Amazon region.
January 2008	US$35 million	The Brazilian Navy	Lockheed Martin secured a contract with the Brazilian Navy to deliver advanced, open-architecture combat systems that will modernize four Tupi-class submarines, one Tikuna-class submarine, and one shore-based trainer system for the Brazilian Navy. Under a contract administered by the US Navy, Lockheed Martin will provide systems engineering, sensors, software, and electronics for the modernization of the diesel submarines' control, and combat management, as part of a foreign military sale of weapons and combat systems to the Brazilian Navy.

Source: Company website and SDI analysis © SDI

8. Business Environment and Country Risk

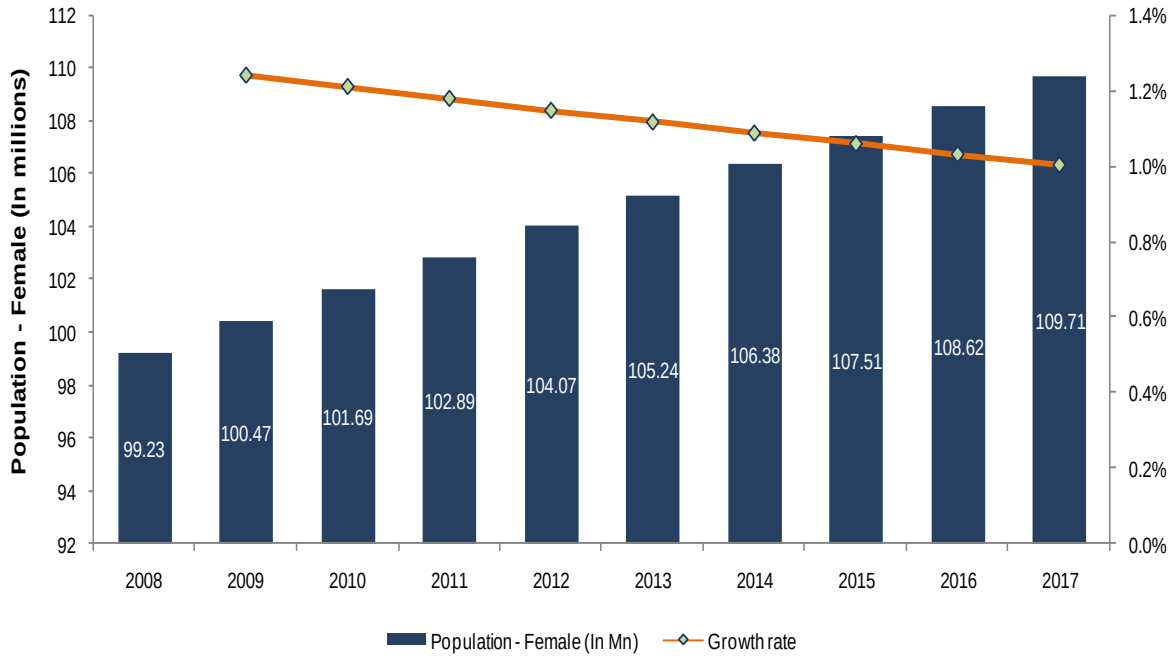
The following sub-sections detail a range of indicators, assessing business environment and country risk in Brazil.

8.1. Demographics & Social Statistics

8.1.1. Population – Female

The Brazilian female population is expected to increase at a CAGR of 1.12%, from 99 million in 2008 to 109 million in 2017.

Figure 31: Brazilian Population – Female (In Millions), 2008–2017

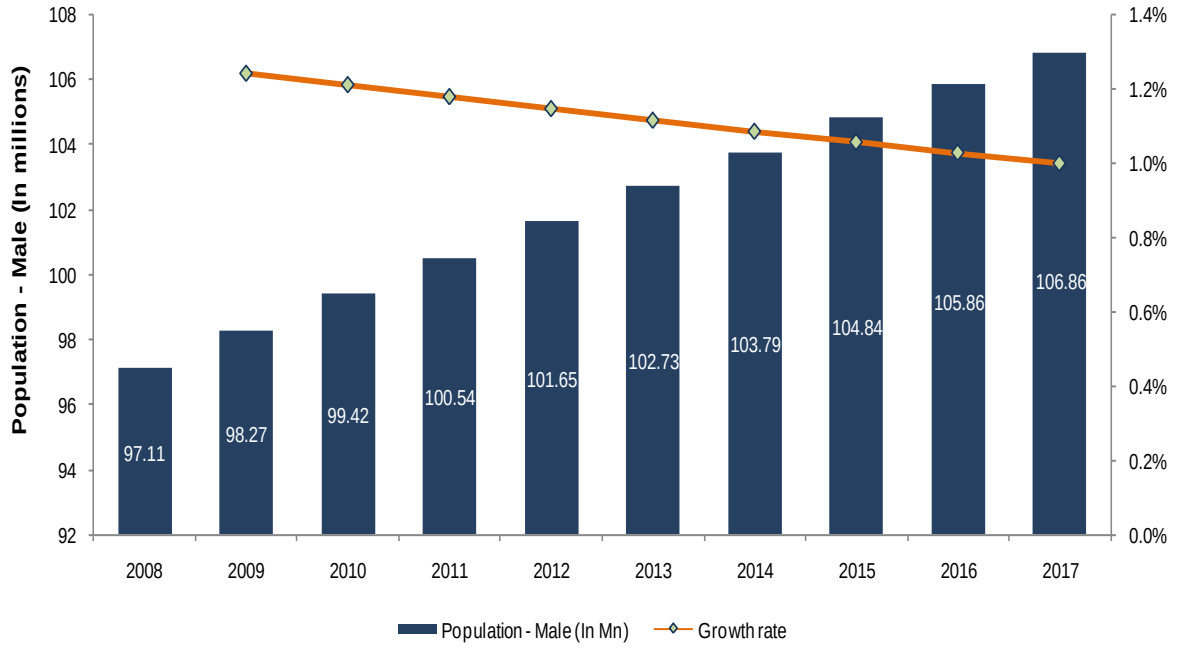


Source: World Bank and SDI analysis

8.1.2. Population - Male

The Brazilian male population too is expected to increase at a CAGR of 1.07%, from 97 million in 2008 to 106 million in 2017.

Figure 32: Brazilian Population – Male (In Millions), 2008–2017

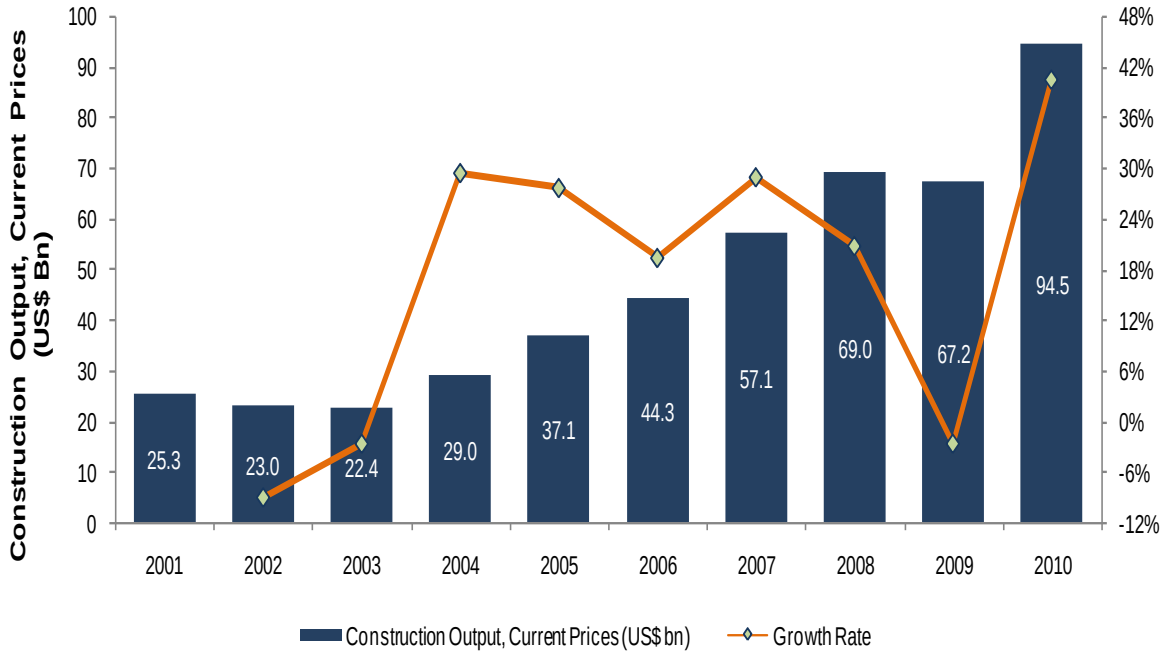


Source: World Bank and SDI analysis

8.2. Economic Performance

8.2.1. Construction Output, Current Prices, Local Currency

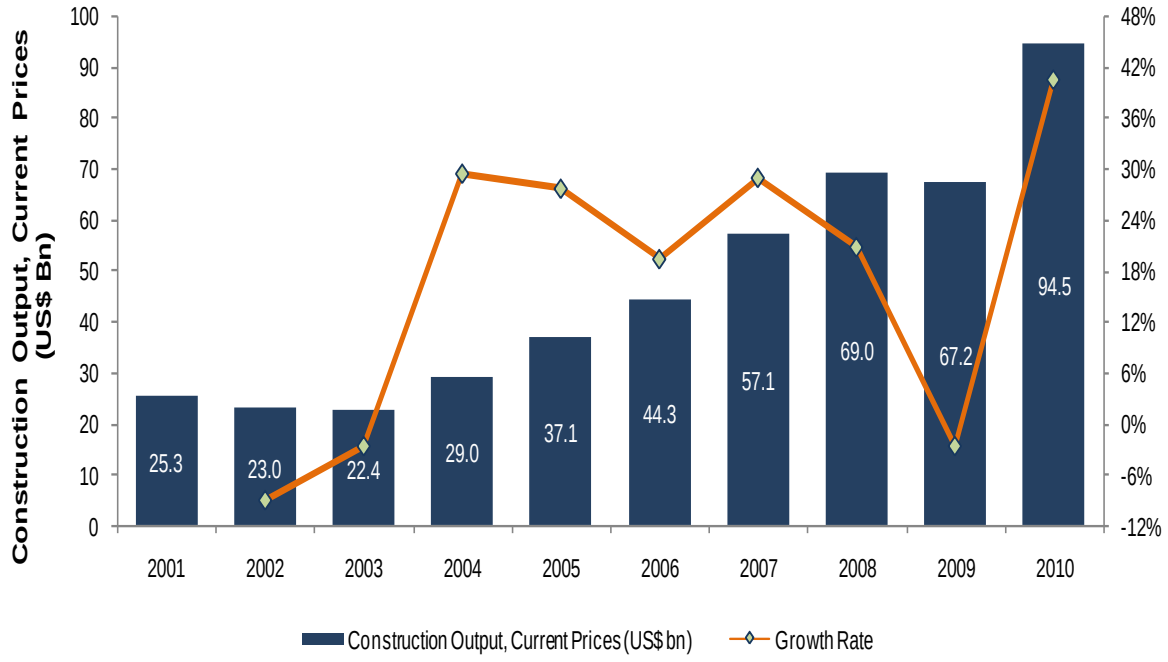
Figure 33: Brazilian Construction Output, Current Prices, Local Currency (In Billions), 2001–2010



Source: United Nations Statistics Division and SDI analysis

8.2.2. Construction Output, Current Prices, US Dollars

Figure 34: Brazilian Construction Output, Current Prices, US Dollars (In Billions), 2001–2010



Source: United Nations Statistics Division and SDI analysis

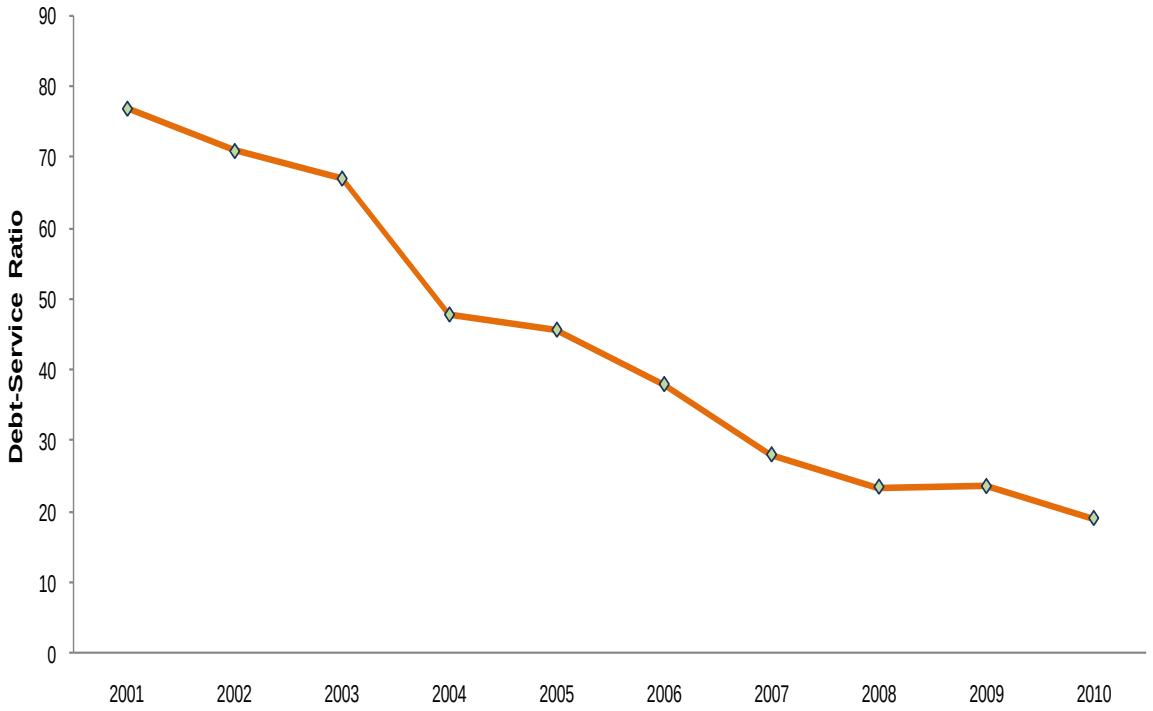
8.2.3. Current Account Balance as Percentage of GDP

Figure 35: Brazilian Current Account Balance as Percentage of GDP, 2008–2017

Source: IMF and SDI analysis

8.2.4. Debt–Service Ratio

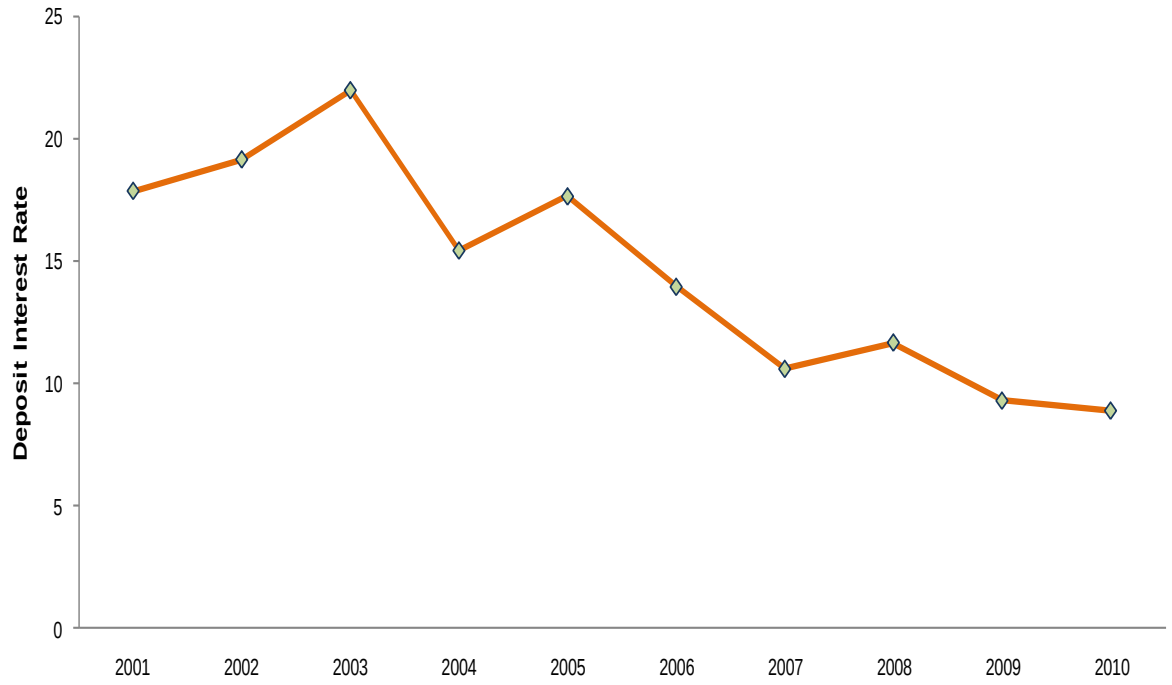
Figure 36: Brazilian Debt–Service Ratio, 2001–2010



Source: IMF and SDI analysis

8.2.5. Deposit Interest Rate

Figure 37: Brazilian Deposit Interest Rate, 2001–2010

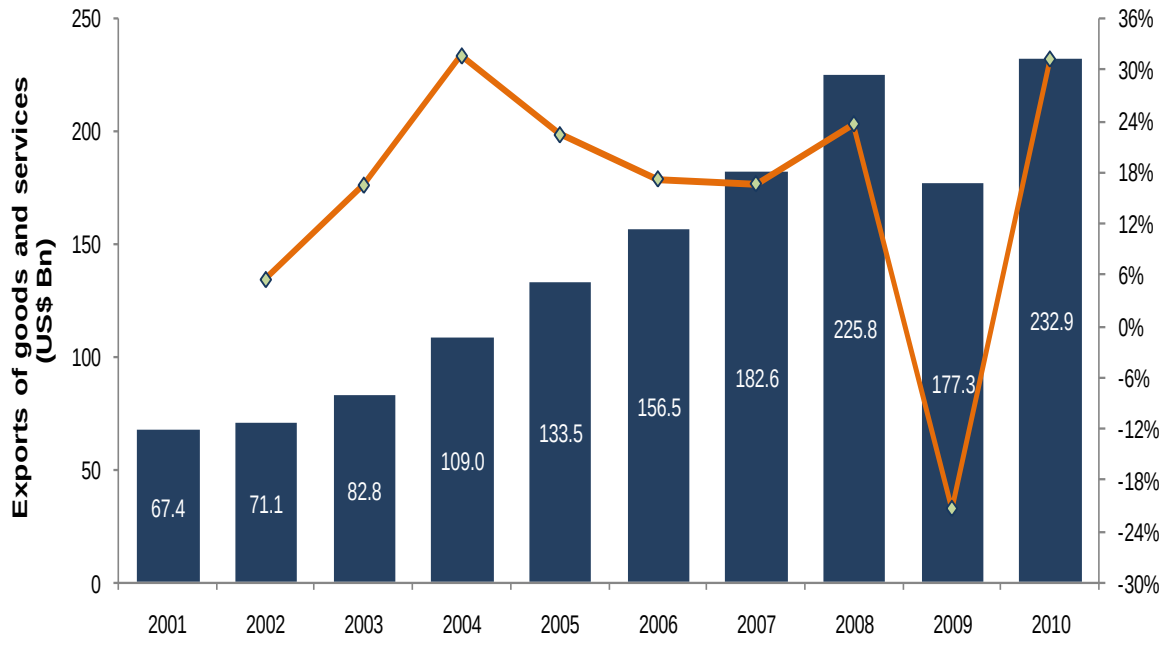


Source: IMF and SDI analysis

8.2.6. Exports of goods and services, current prices, US Dollars

Brazil's exports of goods and services at current prices increased significantly, from US$67.4 billion in 2001 to US$232.9 billion in 2010. It exhibited a CAGR growth of 14.77%.

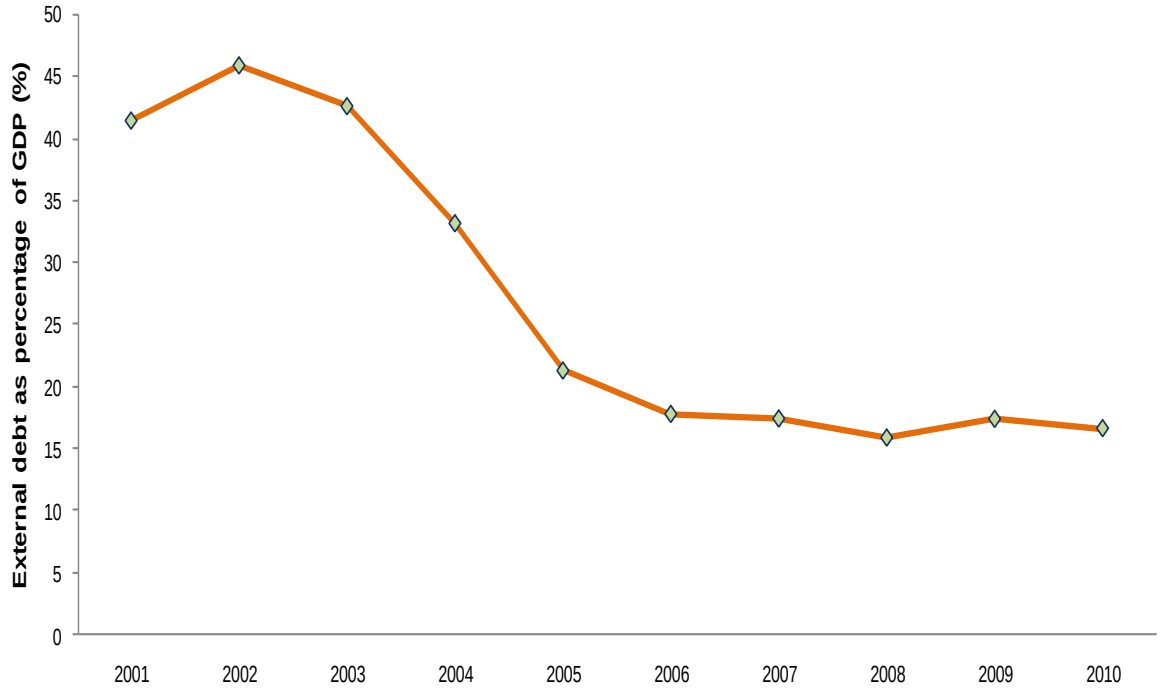
Figure 38: Brazilian Exports of goods and services, current prices (US$ Billion), 2001– 2010



Source: World Bank and SDI analysis

8.2.7. External Debt as Percentage of GDP (%)

Figure 39: Brazilian External Debt as Percentage of GDP (%), 2001– 2010



Source: World BankandSDI analysis

8.2.8. Fiscal Balance as a percentage of GDP

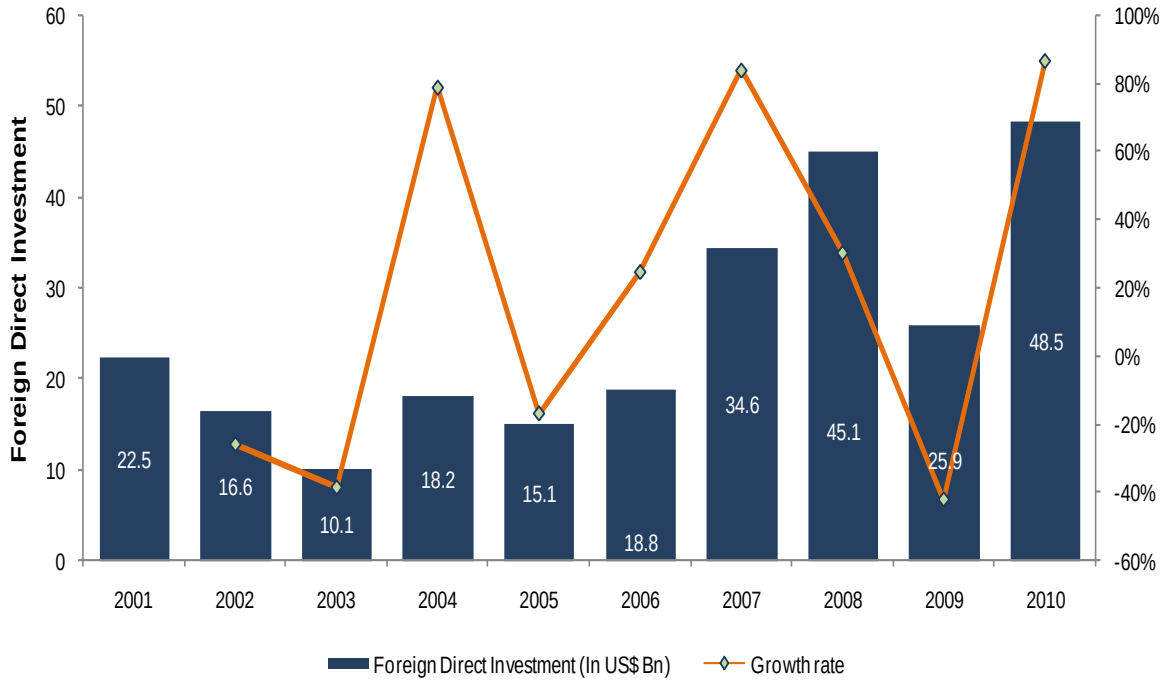
Figure 40: Brazilian Fiscal Balance as a percentage of GDP, 2001–2010

Source: World Bank and SDI analysis

8.2.9. Foreign Direct Investment, US Dollars

Brazil's FDI increased from US$22.5 billion in 2001 to US$48.5 billion in 2010. During the period 2001-2010 it increased at a CAGR of 8.91%.

Figure 41: Brazilian Foreign Direct Investment(US$ Billion), 2001–2010

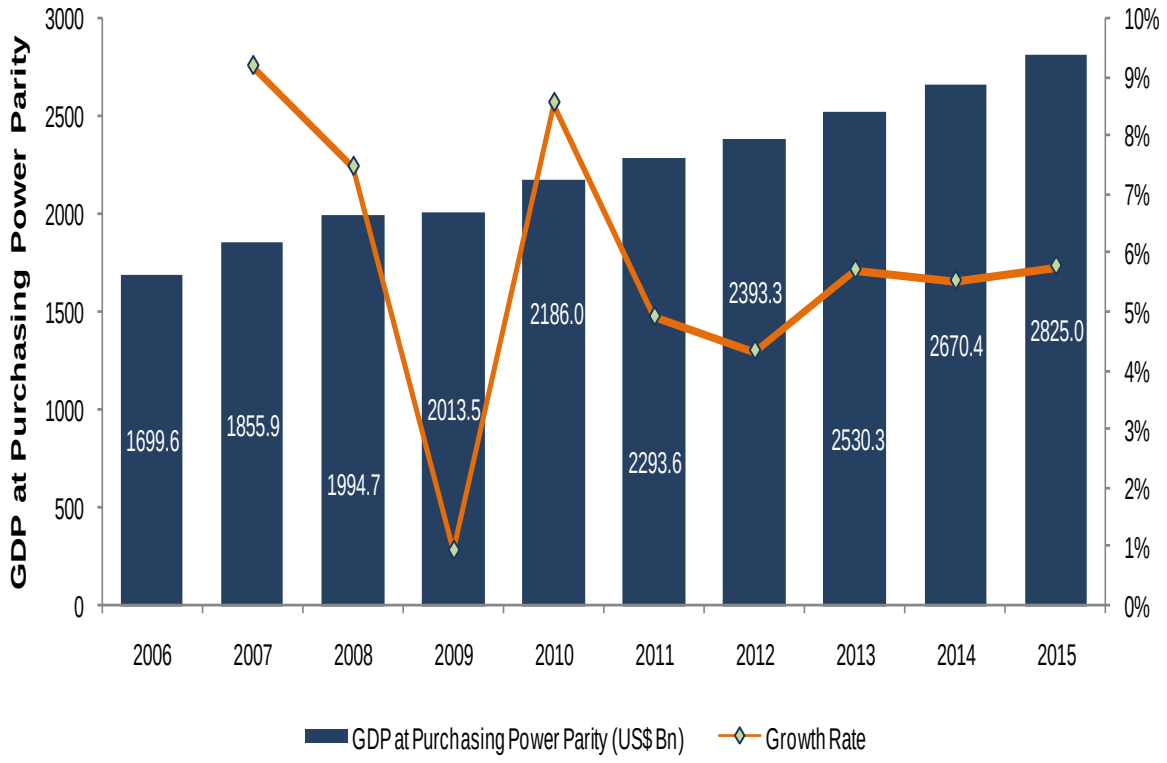


Source: World Bank and SDI analysis

8.2.10. GDP at Purchasing Power Parity

The Brazilian GDP at purchasing power parity witnessed a steady increase throughout the period 2006-2015. It increased at a CAGR of 5.81% to value US$2825 billion in 2015, up from US$1699.6 billion in 2006.

Figure 42: Brazilian GDP at Purchasing Power Parity (US$ Billion), 2006–2015

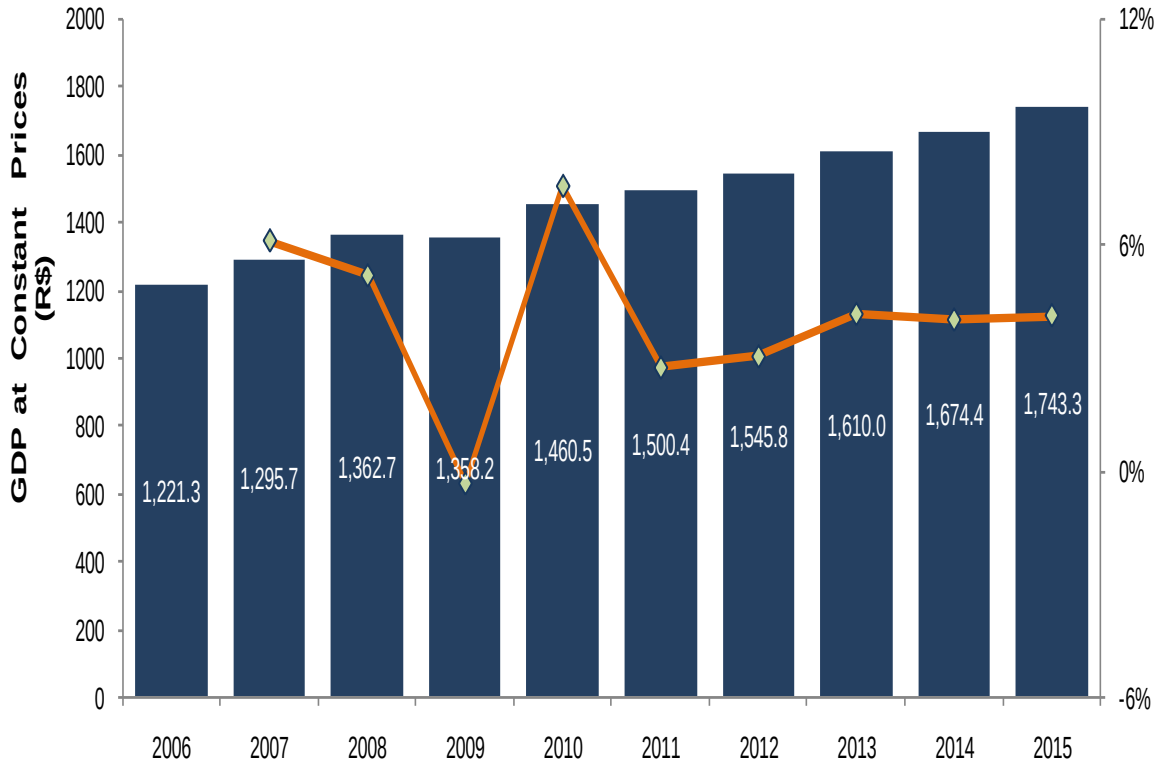


Source: IMF and SDI analysis

8.2.11. GDP, Constant Prices (Brazilian Real)

The GDP at constant prices increased steadily during the period 2006-2011, and is further expected to increase to R$ 1743.3 billion by 2015. CAGR growth during 2006–2015 is 4.03%.

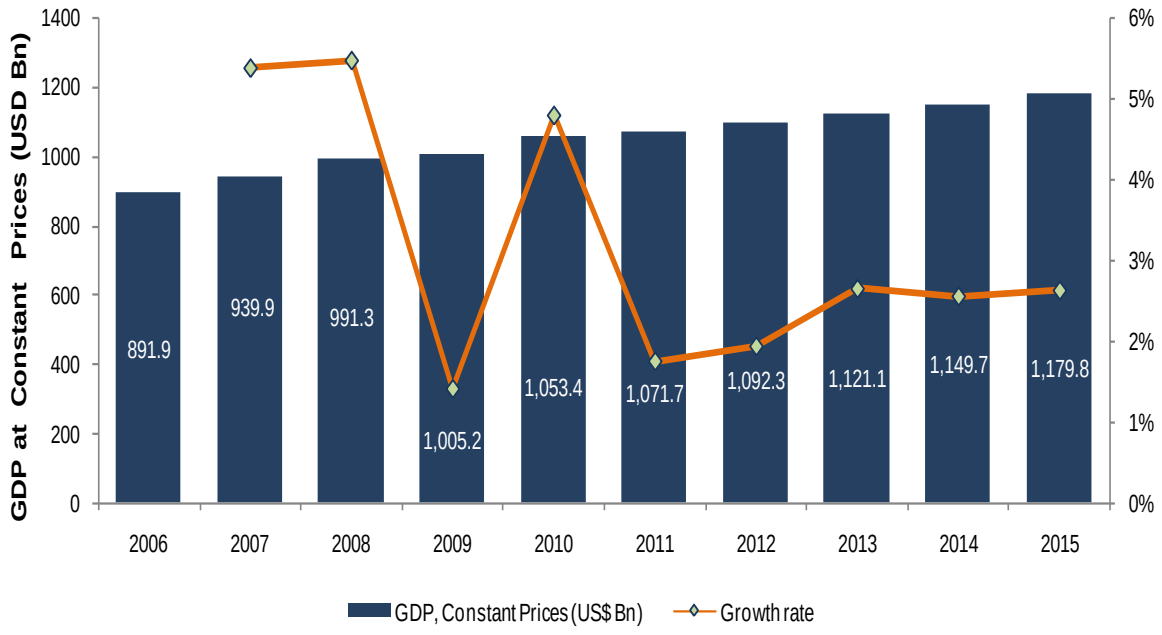
Figure 43: Brazilian GDP at Constant Prices(Brazilian Real Billion), 2006–2015



Source: World Bank, IMF and SDI analysis

8.2.12. GDP, Constant Prices (US Dollars)

Figure 44: Brazilian GDP at Constant Prices(US$ Billion), 2006–2015

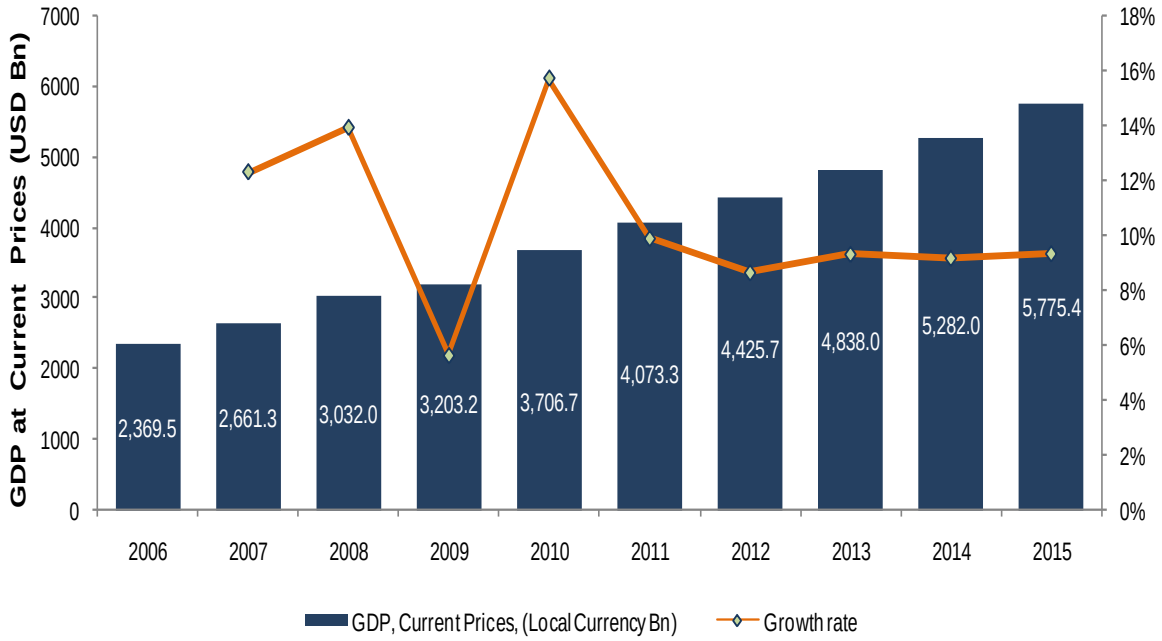


Source: World Bank, IMF and SDI analysis

8.2.13. GDP, Current Prices (Local Currency)

The GDP at current prices increased significantly during the period 2006-2015 and is further expected to increase to R$ 5775.4 billion by 2015. CAGR growth during the period 2006–2015 is 10.41%.

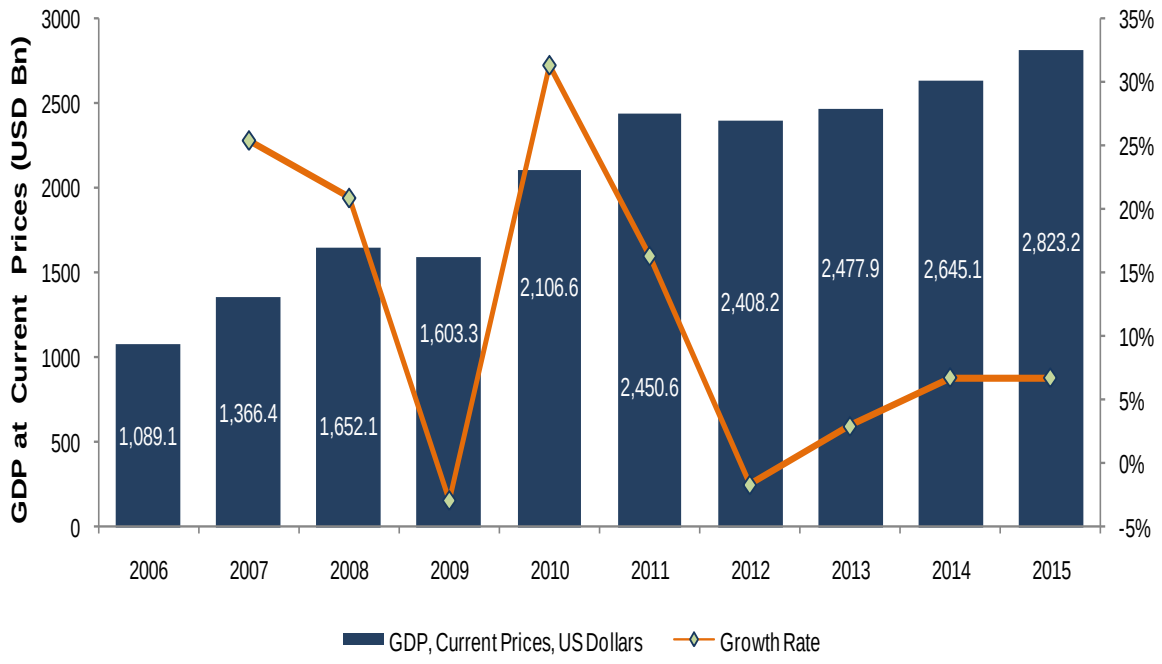
Figure 45: Brazilian GDP at Current Prices(Brazilian Real Billion), 2006–2015



Source: World Bank, IMF and SDI analysis

8.2.14. GDP, Current Prices (US Dollars)

Figure 46: Brazilian GDP at Current Prices(US$ Billion), 2006–2015

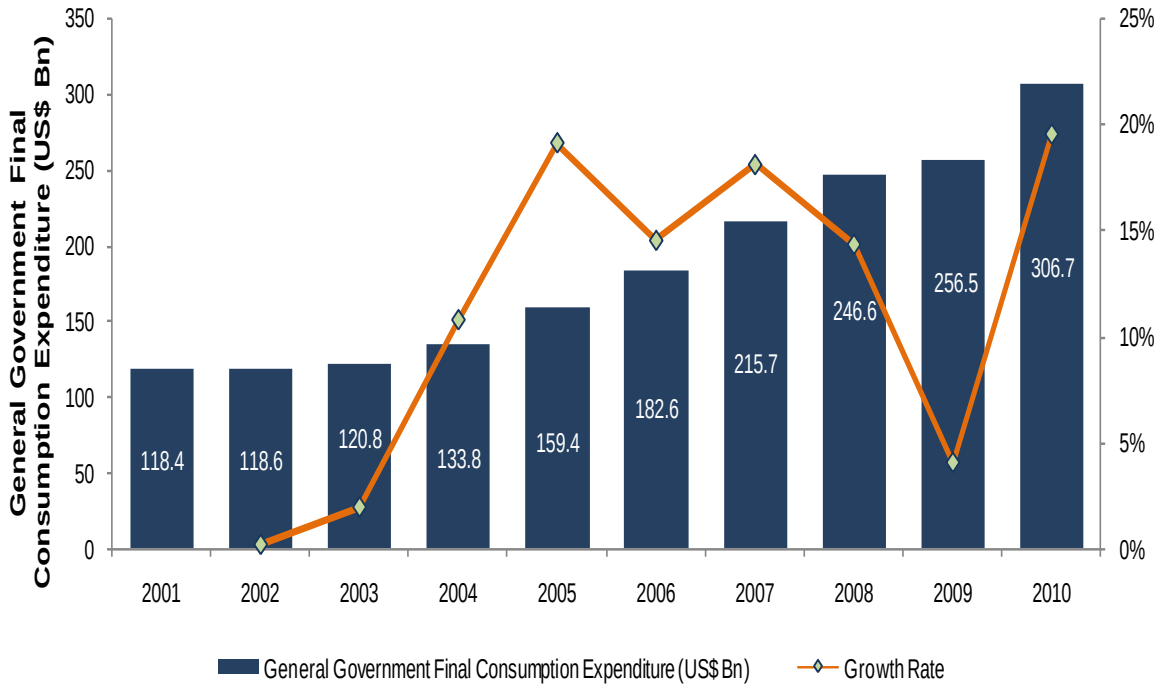


Source: World Bank, IMF and SDI analysis

8.2.15. General Government Final Consumption Expenditure

The Brazilian government final consumption expenditure stood at US$118.4 billion in 2001 and increased at a CAGR of 11.16% during the period 2001-2010, to value US$306.7billion by 2010.

Figure 47: Brazilian General Government Final Consumption Expenditure (US$ Billion), 2001–2010

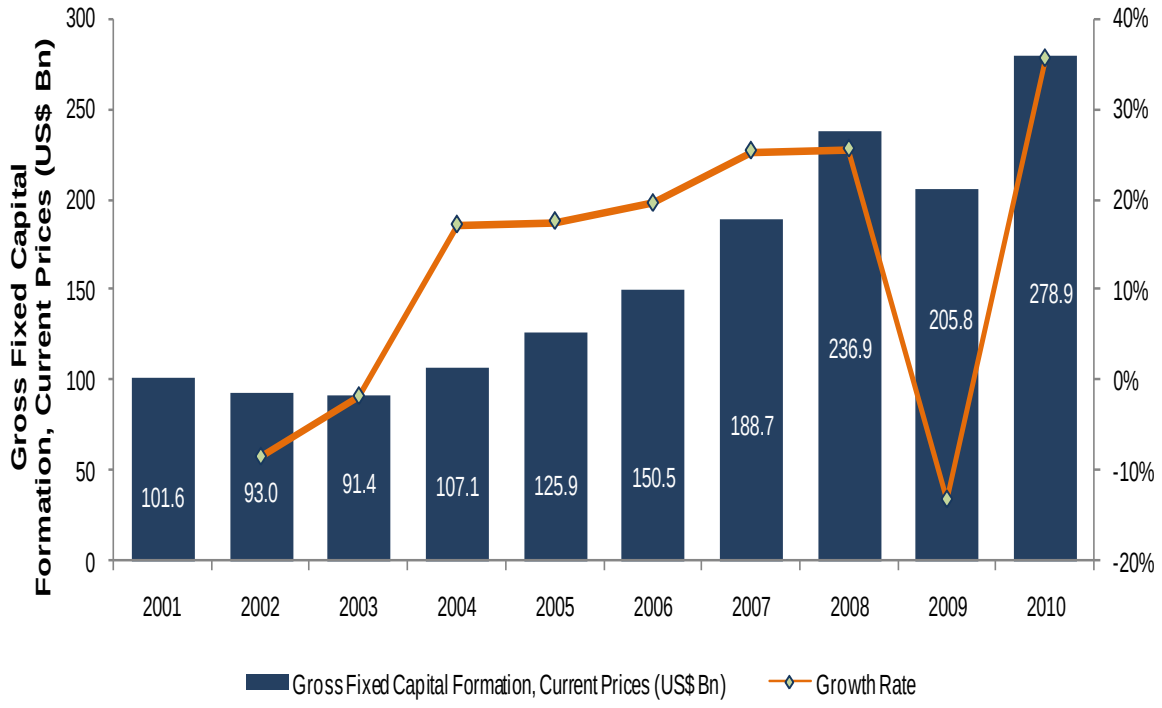


Source: World Bank and SDI analysis

8.2.16. Gross Fixed Capital Formation, Current Prices

The gross fixed capital formation at current prices increased from US$101.6 billion in 2001 to US$278.9 billion in 2010, reflecting a CAGR of 11.87%.

Figure 48: Brazilian Gross Fixed Capital Formation, Current Prices(US$ Billion), 2001–2010

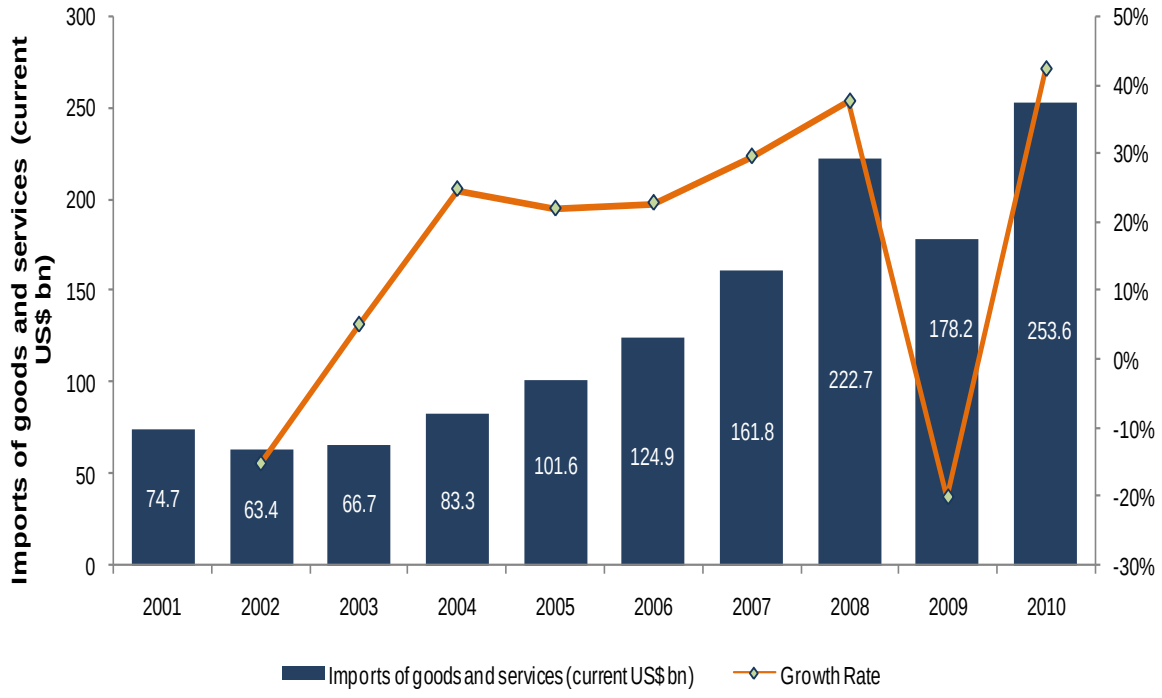


Source: World Bank and SDI analysis

8.2.17. Imports of goods and services

The country's goods and services imports witnessed a fluctuation in growth during the period 2001-2010, which increased at a CAGR of 14.55% and valued US$253.6 billion, up from US$74.7 billion in 2001.

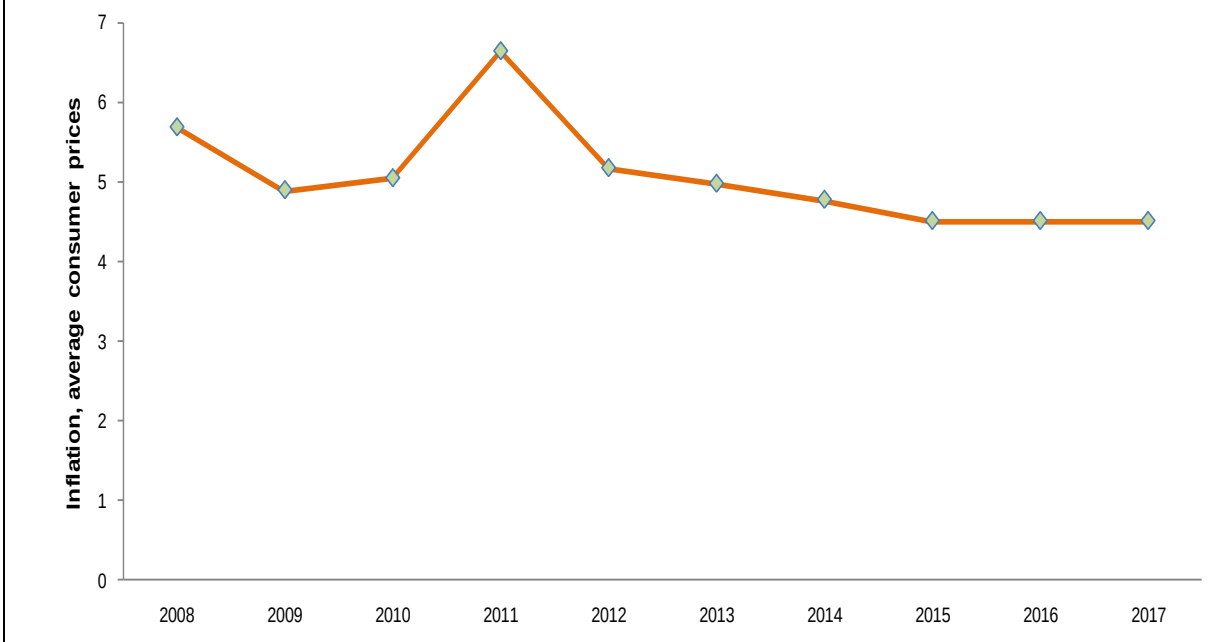
Figure 49: Brazilian Imports of goods and services (current US$ Billion), 2001–2010



Source: World Bank and SDI analysis

8.2.18. Inflation, average consumer prices

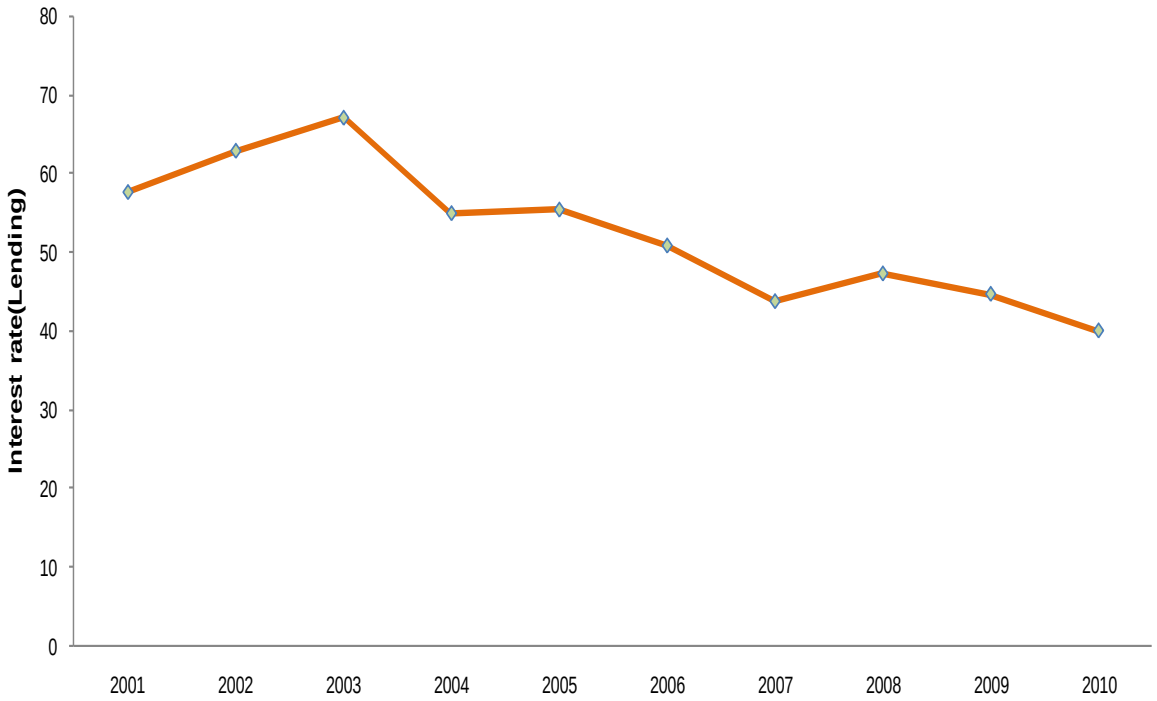
Figure 50: Brazilian Inflation, average consumer prices, 2008–2017



Source: IMF and SDI analysis

8.2.19. Interest Rate Lending

Figure 51: Brazilian Interest Rate Lending, 2001–2010

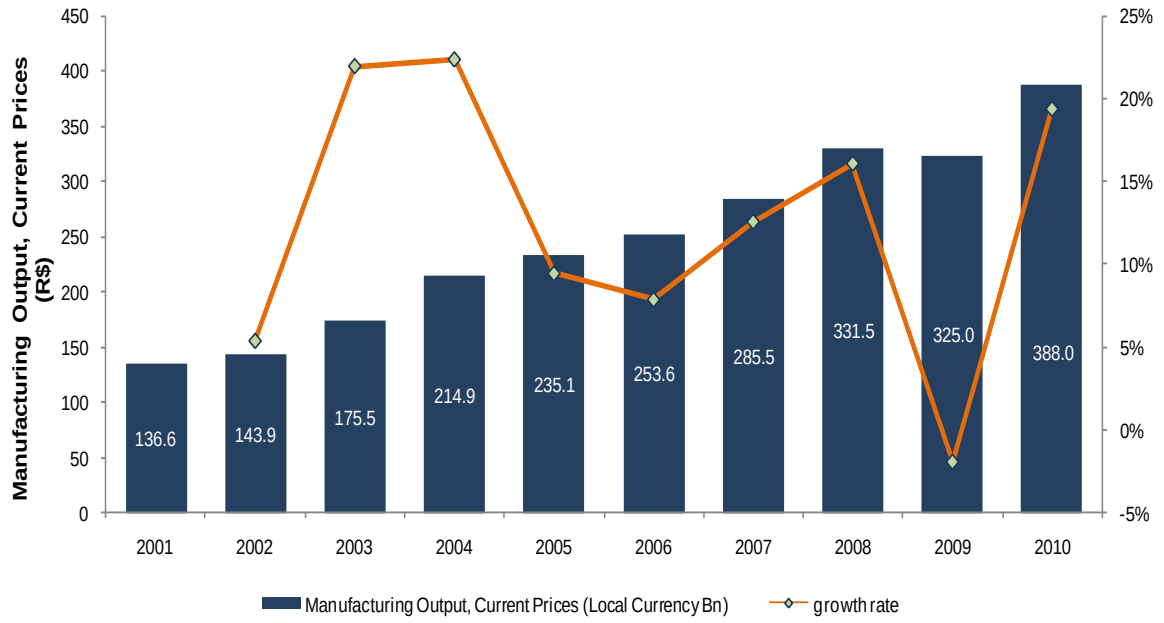


Source: IMF and SDI analysis

8.2.20. Manufacturing Output, Current Prices (Brazilian Real Bn)

The country's manufacturing output at current prices increased from R$ 136.6 billion in 2001 to R$388billion in 2010, thereby reflecting a CAGR increase of 12.3%.

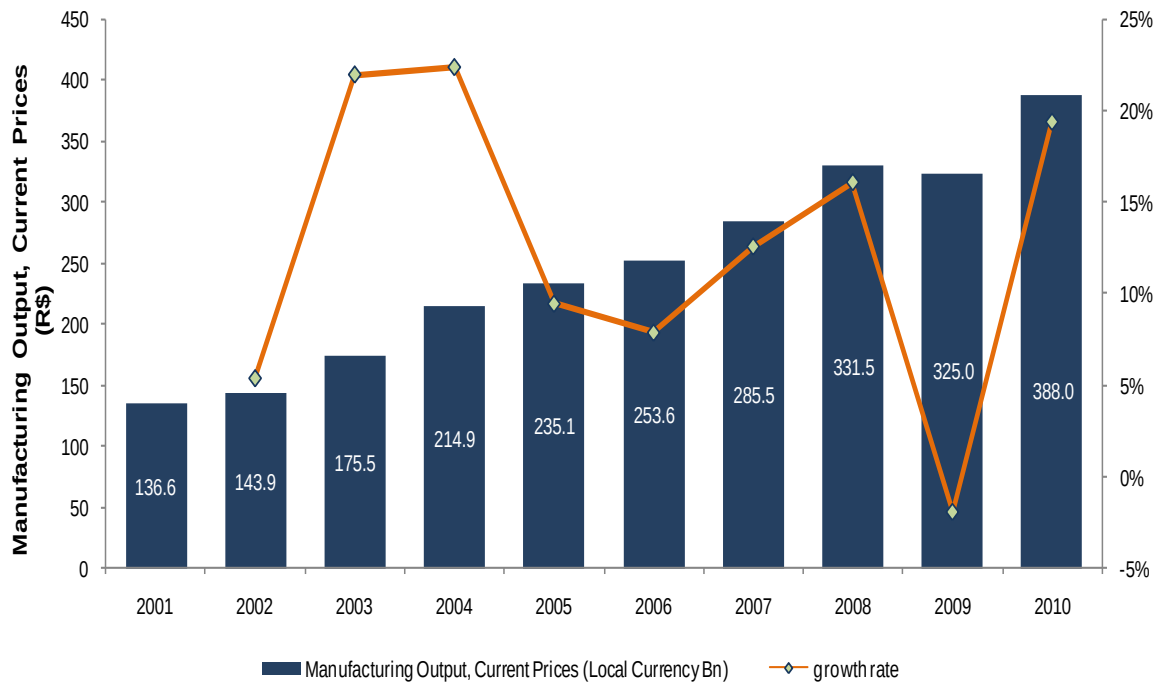
Figure 52: Brazilian Manufacturing Output, Current Prices (Brazilian Real Billion), 2001–2010



Source: World Bank and SDI analysis

8.2.21. Manufacturing Output, Current Prices (US$ Billions)

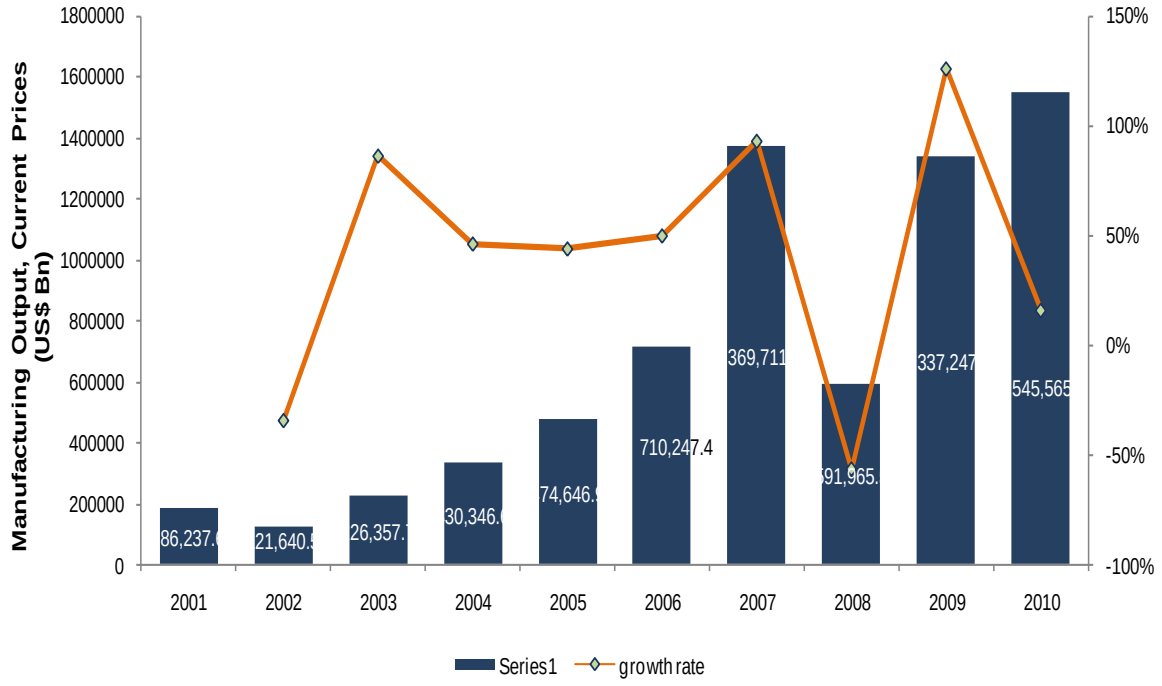
Figure 53: Brazilian Manufacturing Output, Current Prices (US$ Billion), 2001–2010



Source: World Bank and SDI analysis

8.2.22. Market cap of Stock Exchange (US$ Mn)

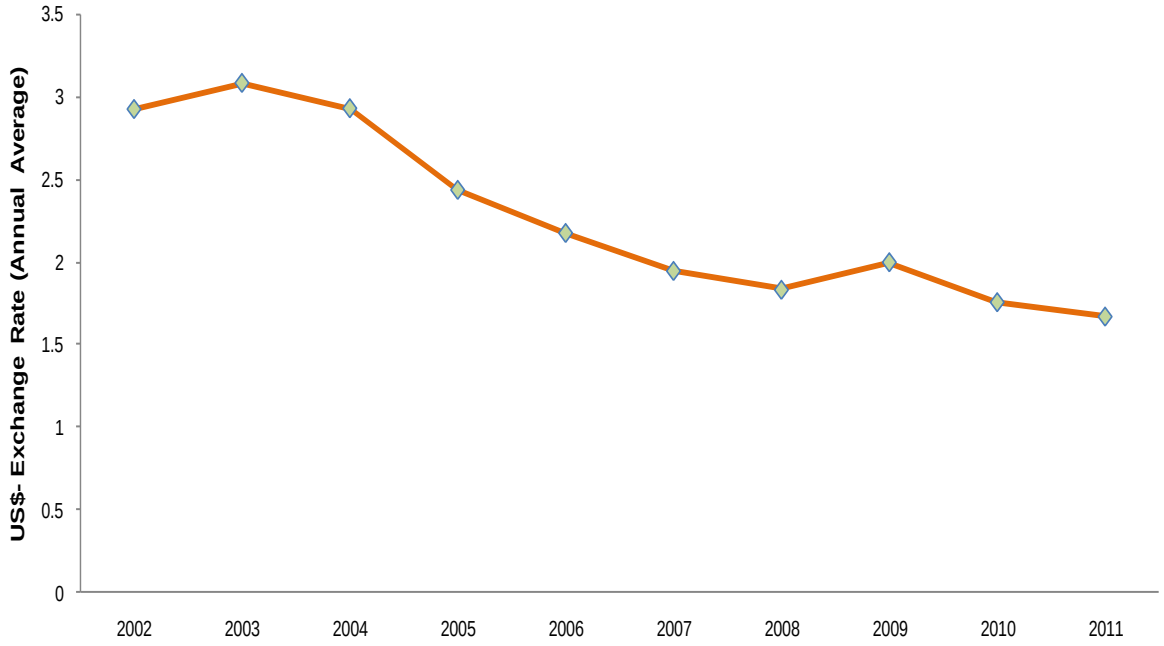
Figure 54: Brazilian Market cap of Stock Exchange (US$ Million), 2001–2010



Source: World Bank and SDI analysis

8.2.23. US$- Exchange Rate (Annual Average)

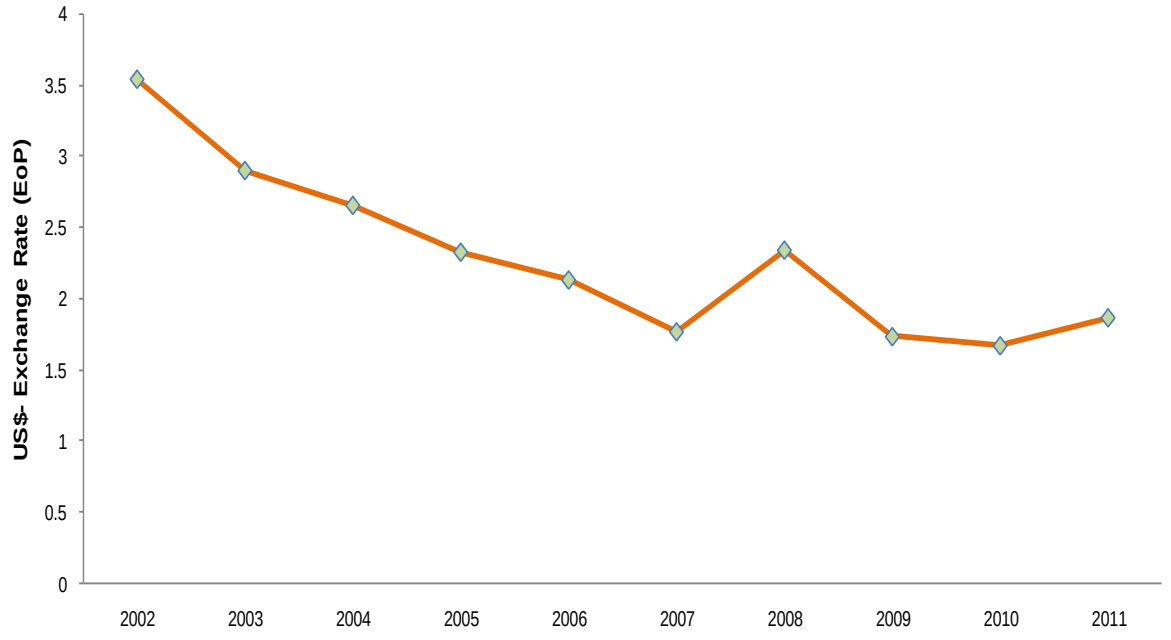
Figure 55: Brazilian US$- Exchange Rate (Annual Average), 2002–2011



Source: World Bank and SDI analysis

8.2.24. US$- Exchange Rate (EoP)

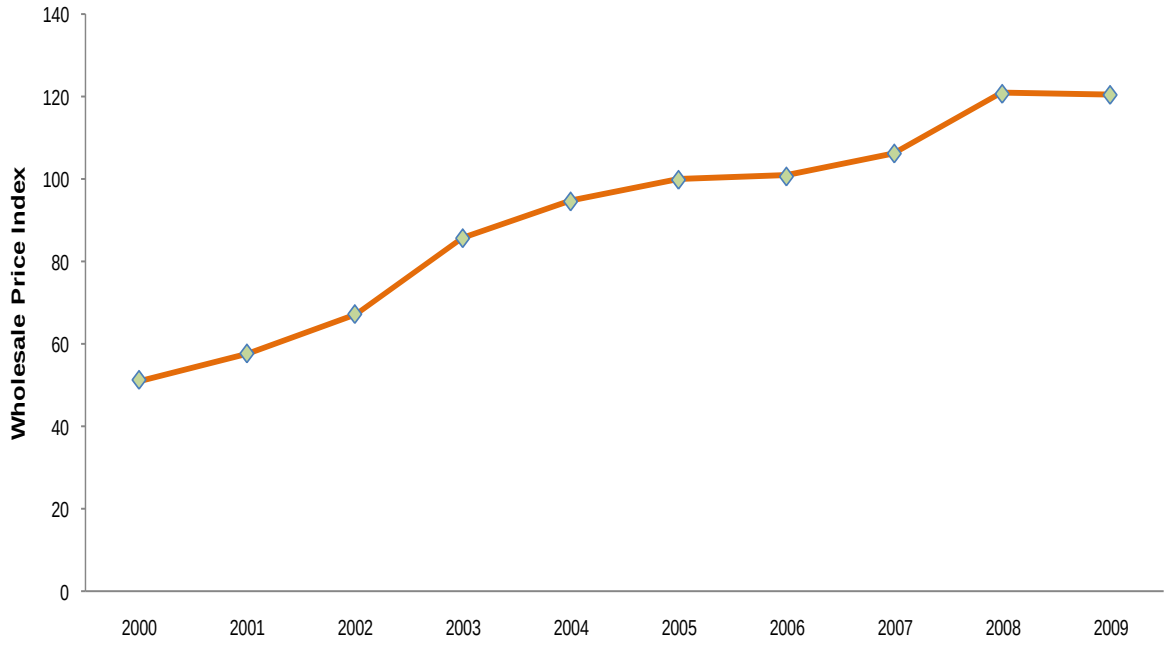
Figure 56: Brazilian US$- Exchange Rate (EoP), 2002–2011



Source: World Bank and SDI analysis

8.2.25. Wholesale Price Index

Figure 57: Brazilian Wholesale Price Index, 2000–2009



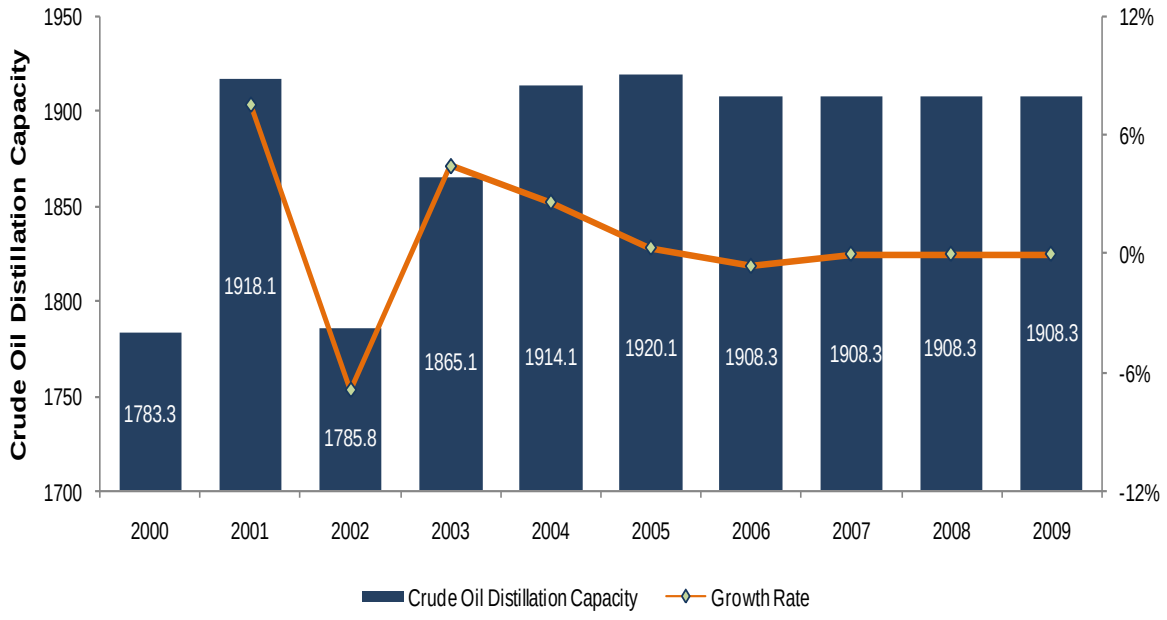
Source:United Nations Statistics Division and SDI analysis

8.3. Energy and Utilities

8.3.1. Crude Oil Distillation Capacity

The Brazilian crude oil distillation capacity, which stood at 1783.3 thousand barrels per day in 2000, increased marginally to stand at 1908.3 barrels per day in 2009.

Figure 58: Brazilian Crude Oil Distillation Capacity (Thousand Barrels Per Cal Day), 2000–2009

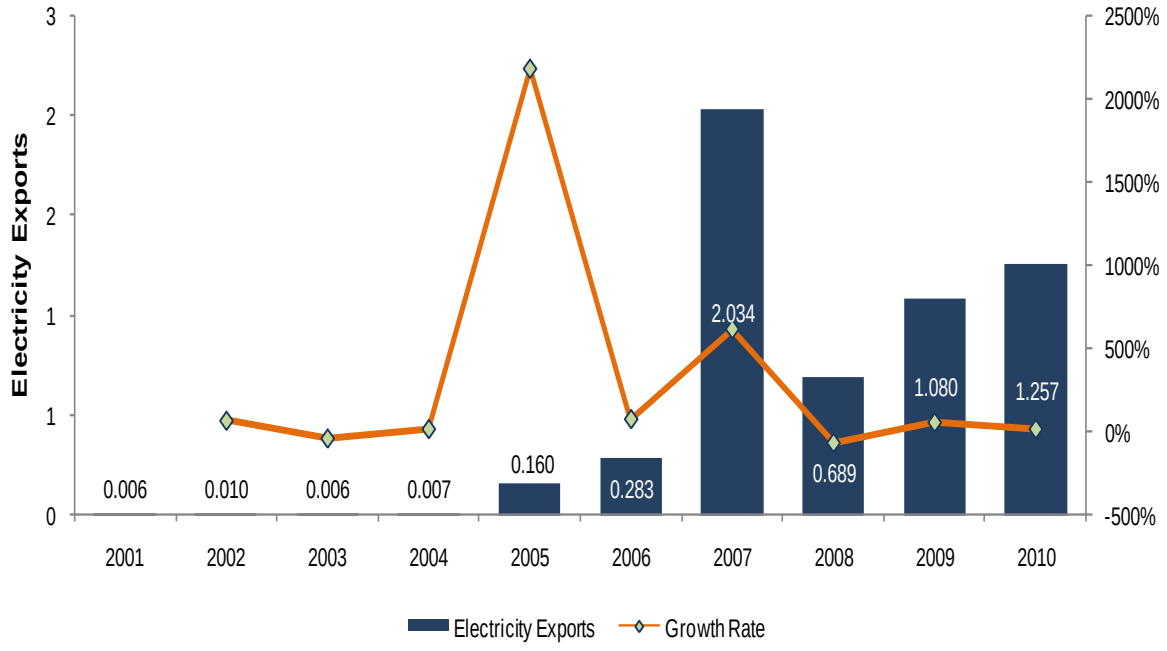


Source: U.S. Energy Information Administration (EIA) and SDI analysis

8.3.2. Electricity Exports

The country's electricity exports witnessed a steep increase during the period 2001-2010, from 0.006billion kilowatt hours to 1.257billion kilowatt hours.

Figure 59: Brazilian Electricity Exports (Billion Kilowatt hours), 2001–2010



Source: U.S. Energy Information Administration (EIA) and SDI analysis

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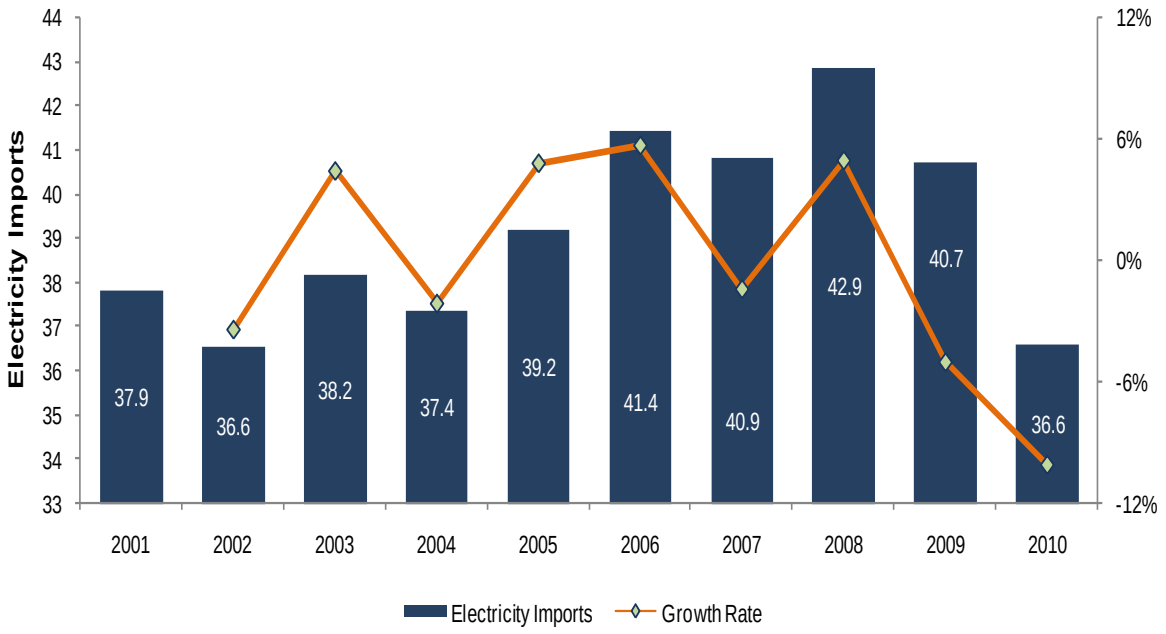
8.3.3. Electricity Imports

The country's electricity imports witnessed a marginal decrease during the period 2001-2010, from 37.9billion kilowatt hours to 36.6 billion kilowatt hours.

Figure 60: Brazilian Imports (Billion Kilowatt hours), 2001–2010

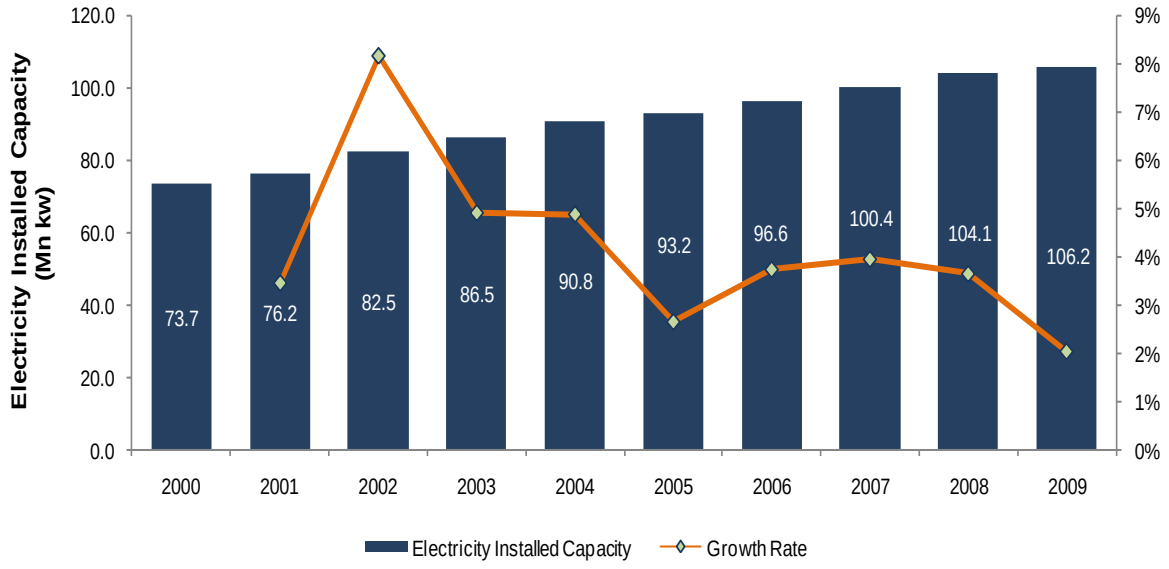


Source: U.S. Energy Information Administration (EIA) and SDI analysis

8.3.4. Electricity Installed Capacity

The country's electricity installed capacity witnessed a marginal increase during the period 2000-2009, from 73.7 million kilowatts to 106.2 million kilowatts.

Figure 61: Brazilian Electricity Installed Capacity (Million Kilowatts), 2000–2009

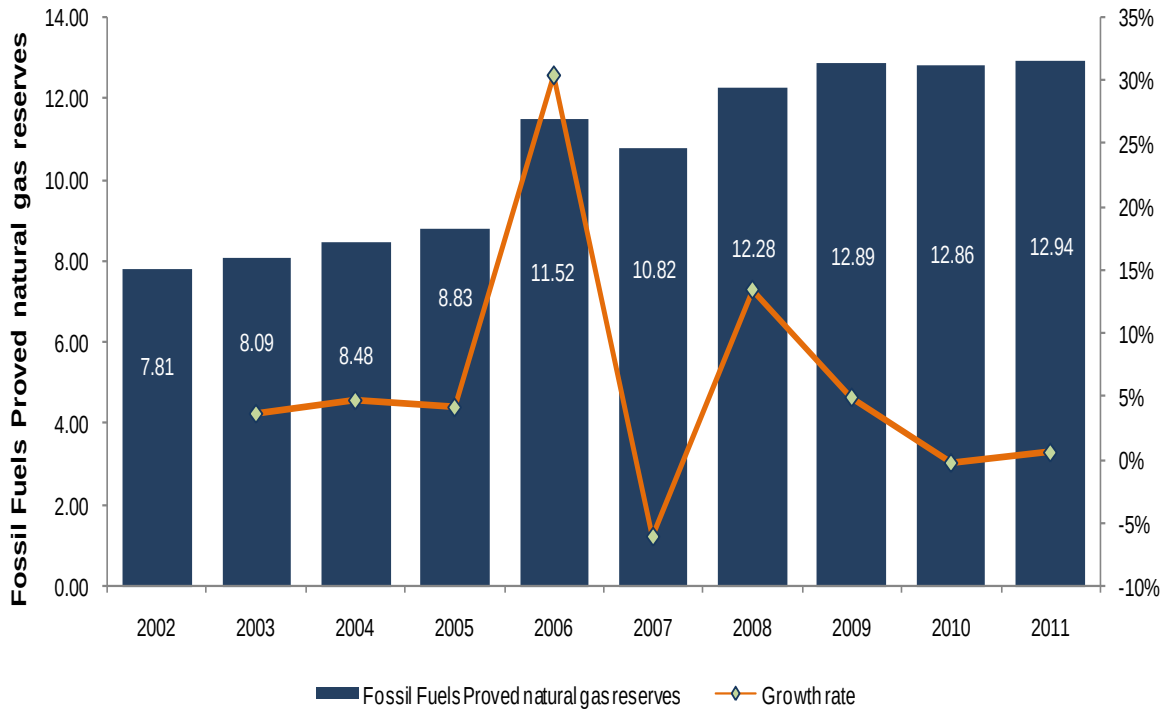


Source: U.S. Energy Information Administration (EIA) and SDI analysis

8.3.5. Fossil Fuels Proved natural gas reserves

The Brazilian Fossil Fuels proved natural gas reserves stood at 7.81 trillion cubic feet in 2002. This decreased to 12.94trillion cubic feet in 2011.

Figure 62: Brazilian Fossil Fuels Proved Natural Gas Reserves (Trillion Cubic Feet), 2002–2011

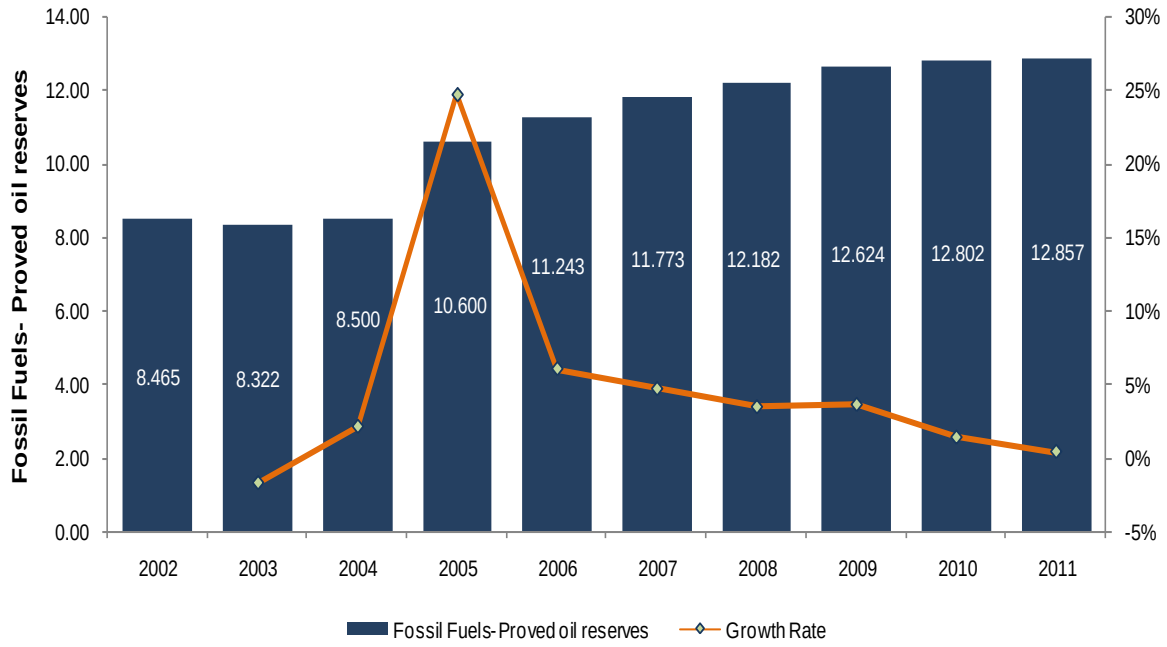


Source: U.S. Energy Information Administration (EIA) and SDI analysis

8.3.6. Fossil Fuels- Proved oil reserves

The Brazilian Fossil Fuels Proved oil reserves stood at8.465 billion barrels in 2002. This decreased to 12.86 billion barrels in 2011during the period.

Figure 63: Brazilian Fossil Fuels Proved Oil Reserves (Billion Barrels), 2002–2011

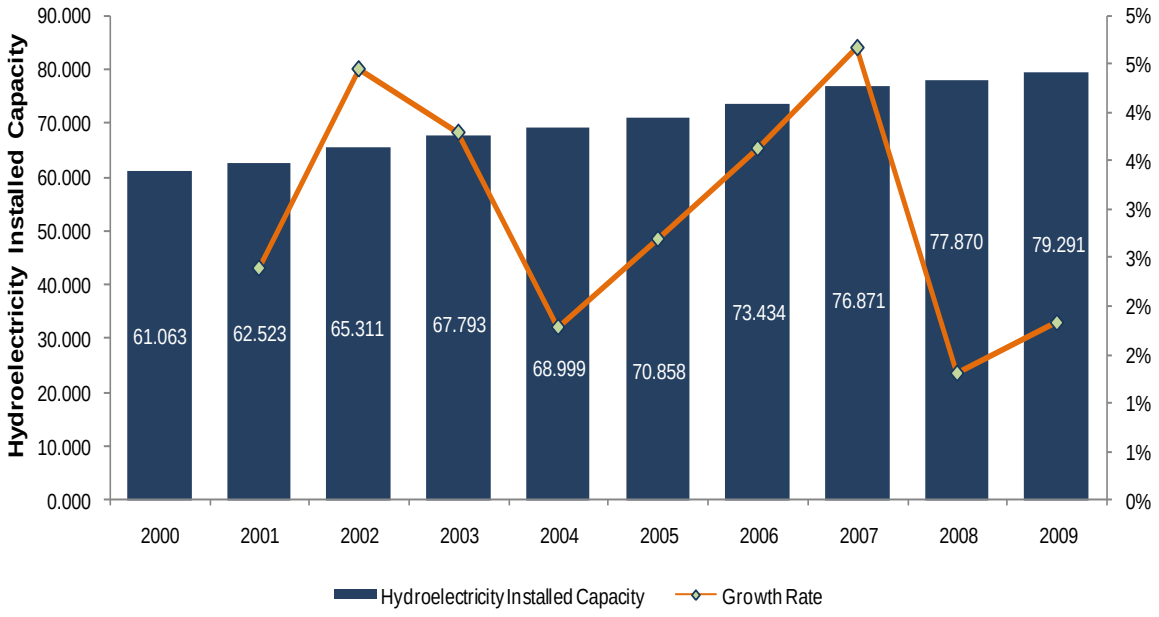


Source: U.S. Energy Information Administration (EIA) and SDI analysis

8.3.7. Hydroelectricity Installed Capacity

The Brazilian hydroelectricity installed capacity stood at 61.06 million kw in 2000. This increased marginally to 73.29 kw in 2009.

Figure 64: Brazilian Hydroelectricity Installed Capacity (Million Kilowatts), 2000–2009



Source: U.S. Energy Information Administration (EIA) and SDI analysis

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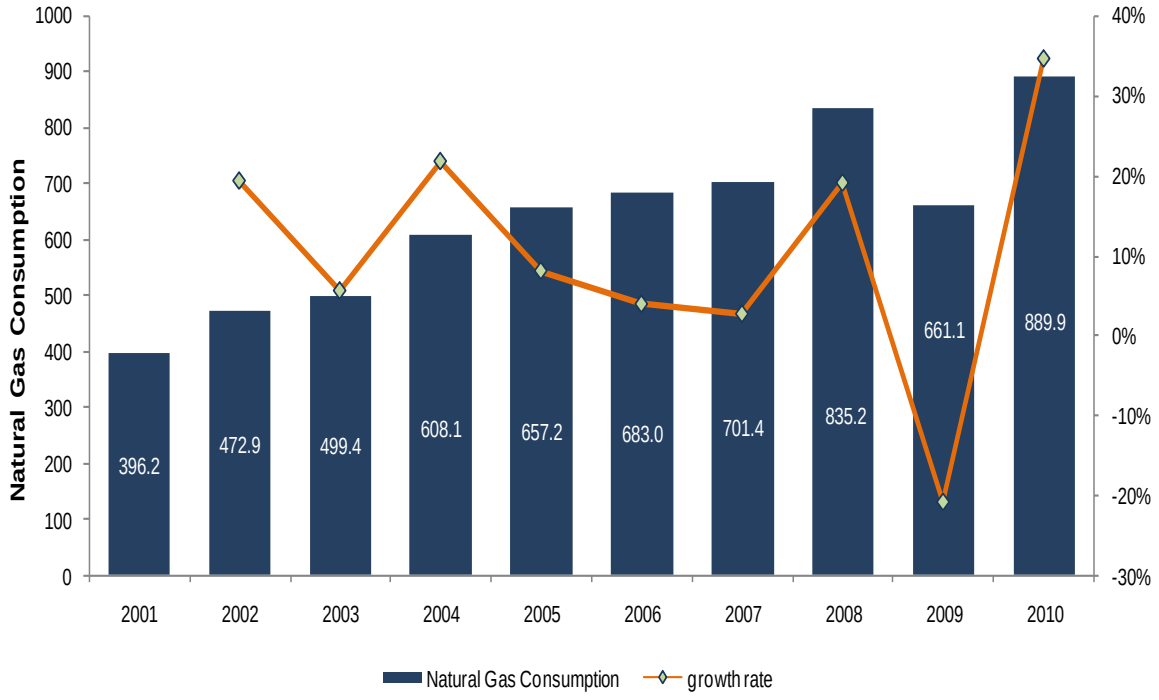
8.3.8. Natural Gas Consumption

The Brazilian Natural Gas Consumption stood at 396.2 billion cubic feet in 2001. This increased to 889.9 billion cubic feet in 2010.

Figure 65: Brazilian Natural Gas Consumption (Million Cubic Feet), 2001–2010

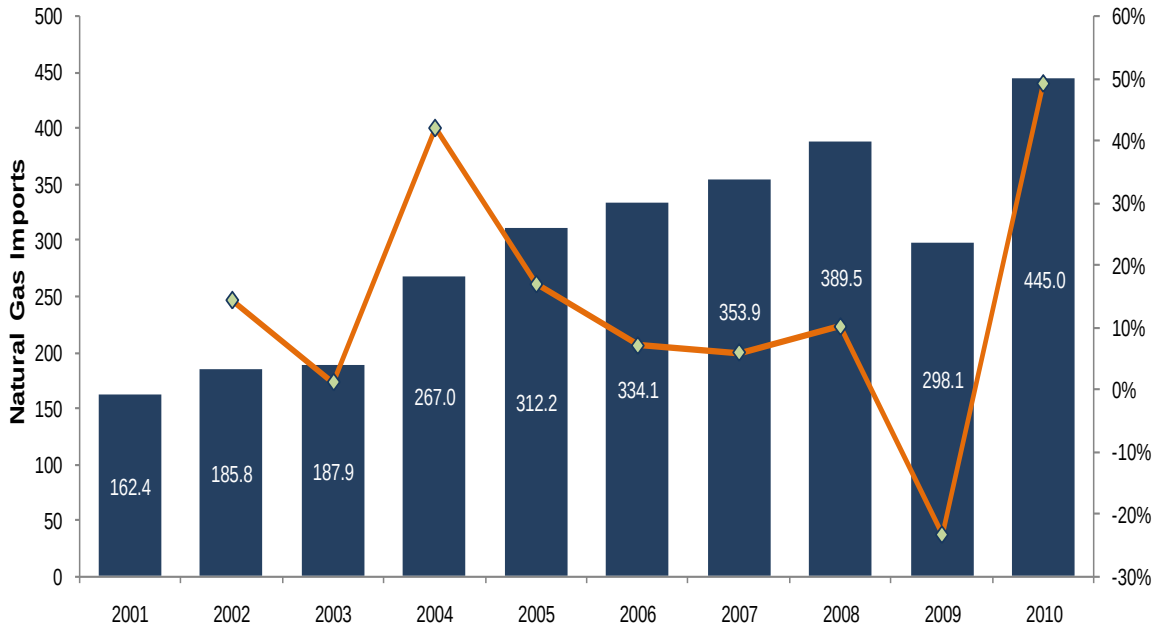


Source: U.S. Energy Information Administration (EIA) and SDI analysis

8.3.9. Natural Gas Imports

The Brazilian natural gas imports stood at 162.4 billion cubic feet in 2001. This increased to 445 billion cubic feet in 2010.

Figure 66: Brazilian Natural Gas Imports(Billion Cubic Feet), 2001–2010

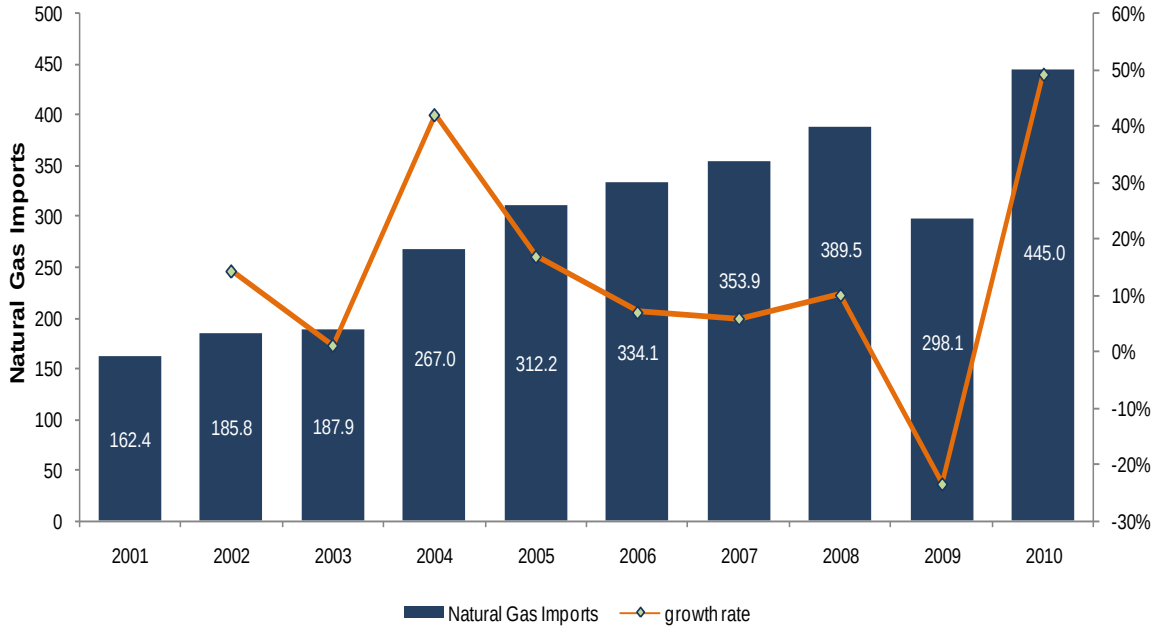


Source: U.S. Energy Information Administration (EIA) and SDI analysis

8.3.10. Natural Gas Production

The Brazilian natural gas production increased from 162.4 billion cubic feet in the year 2001 to 445 billion cubic feet in the year 2010.

Figure 67: Brazilian Natural Gas Production(Billion Cubic Feet), 2001–2010

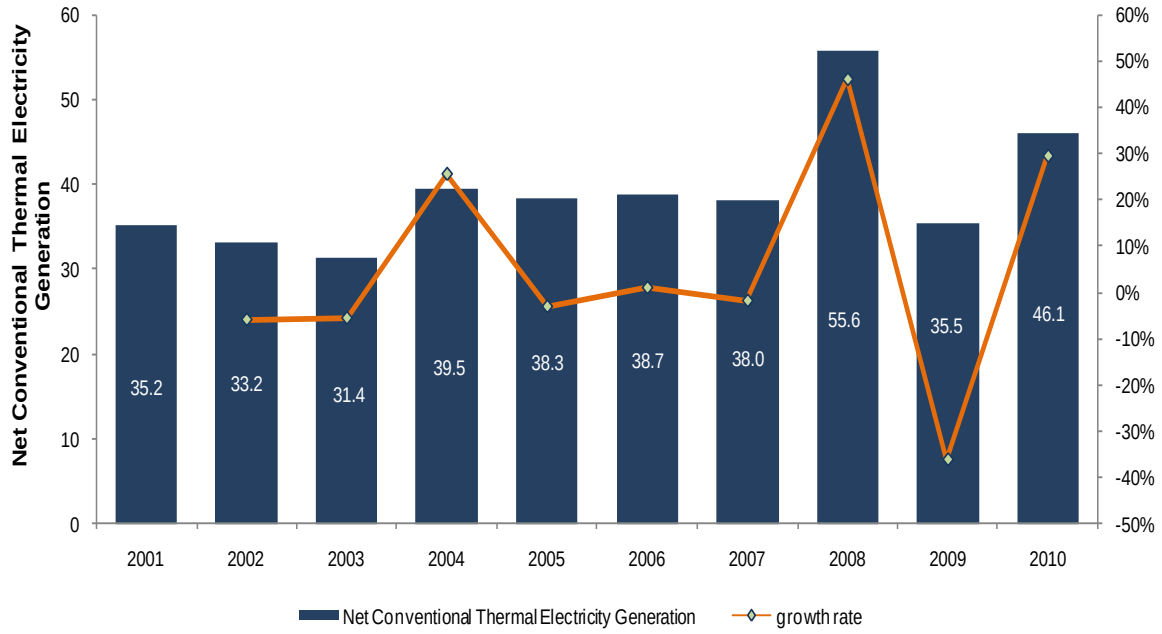


Source: U.S. Energy Information Administration (EIA) and SDI analysis

8.3.11. Net Conventional Thermal Electricity Generation

The Brazilian net conventional thermal electricity generation increased from 35.2 billion kwh in 2001 to 46.1 billion kwh in 2010.

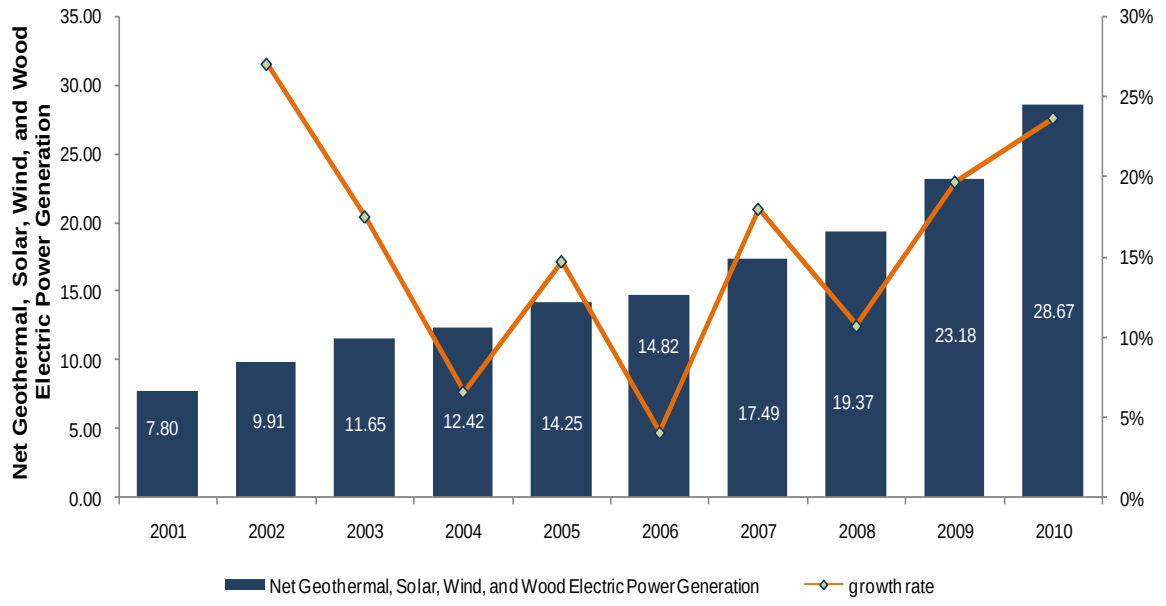
Figure 68: Brazilian Net Conventional Thermal Electricity Generation (Billion Kilowatt hours), 2001–2010



Source: U.S. Energy Information Administration (EIA) and SDI analysis

8.3.12. Net Geothermal, Solar, Wind, and Wood Electric Power Generation

Figure 69: Brazilian Net Geothermal, Solar, Wind, and Wood Electric Power Generation (Billion Kilowatt hours), 2001–2010

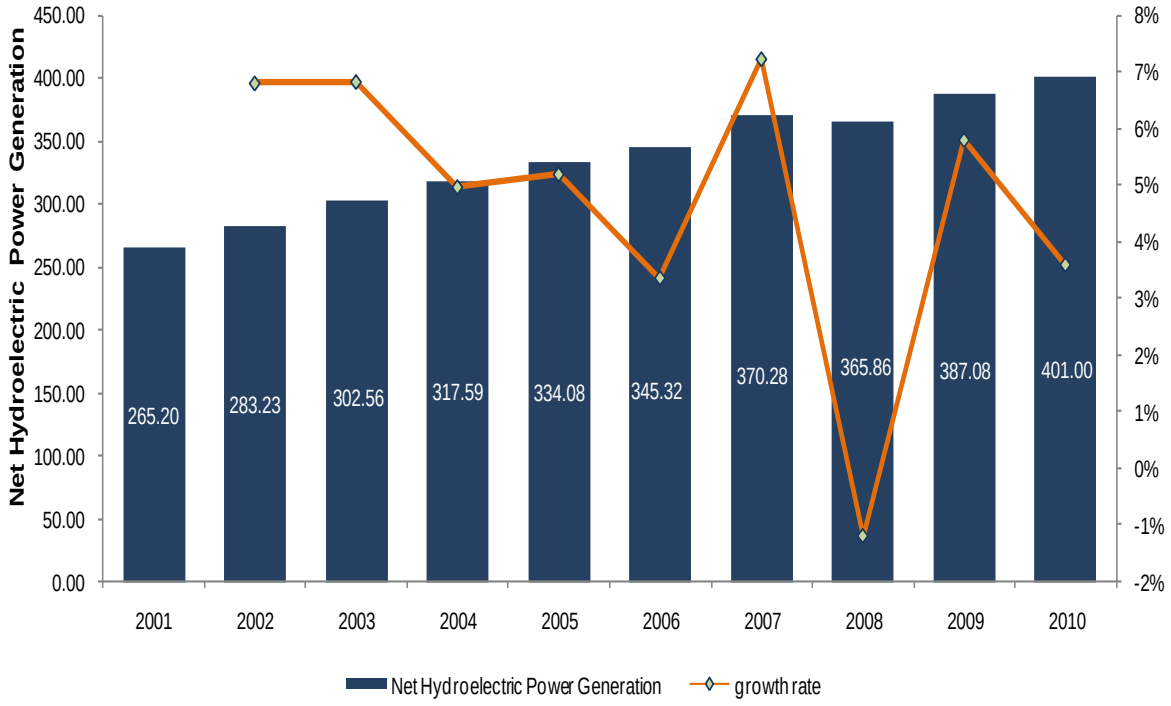


Source: U.S. Energy Information Administration (EIA) and SDI analysis

8.3.13. Net Hydroelectric Power Generation

The country's net hydroelectric power generation capacity increased from 265.2billion kwh in 2001 to 401 kwh in 2010.

Figure 70: Brazilian Net Hydroelectric Power Generation(Billion Kilowatt hours), 2001–2010

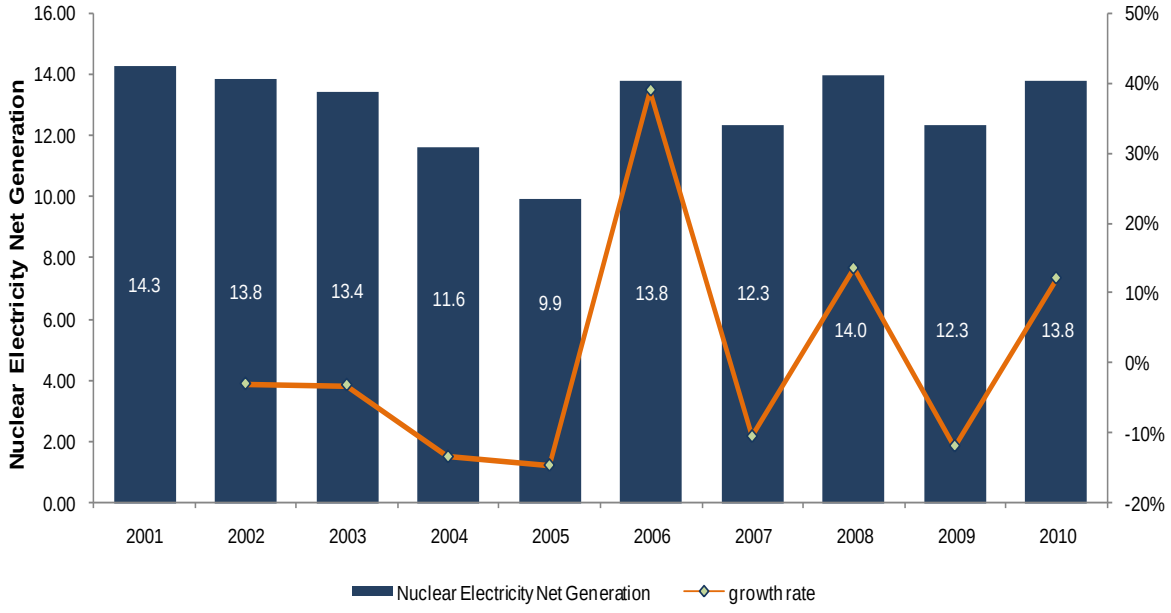


Source: U.S. Energy Information Administration (EIA) and SDI analysis

8.3.14. Nuclear Electricity Net Generation

The country's nuclear electricity net generation decreased marginally, from 14.3billionkwh in 2001 to 13.8 billion kwh in 2010.

Figure 71: Brazilian Nuclear Electricity Net Generation(Billion Kilowatt hours), 2001–2010

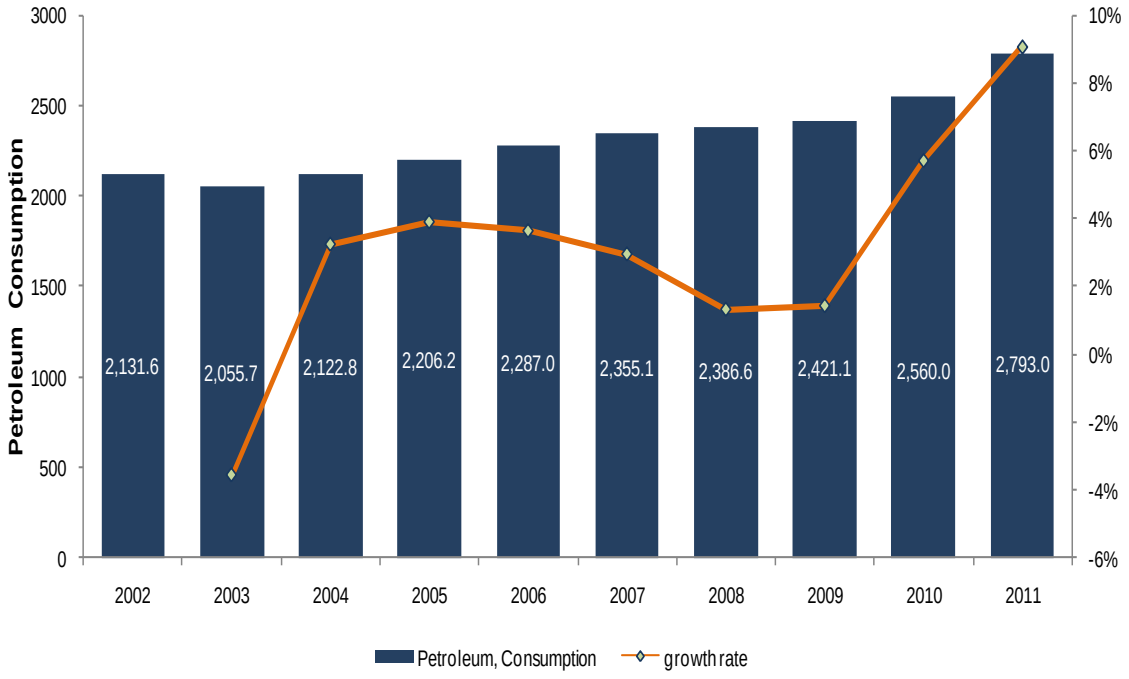


Source: U.S. Energy Information Administration (EIA) and SDI analysis

8.3.15. Petroleum, Consumption

Brazil's petroleum consumption increased marginally during the period 2002-2011, from 2,131.6 thousand barrels a day to 2,793 thousand barrels a day.

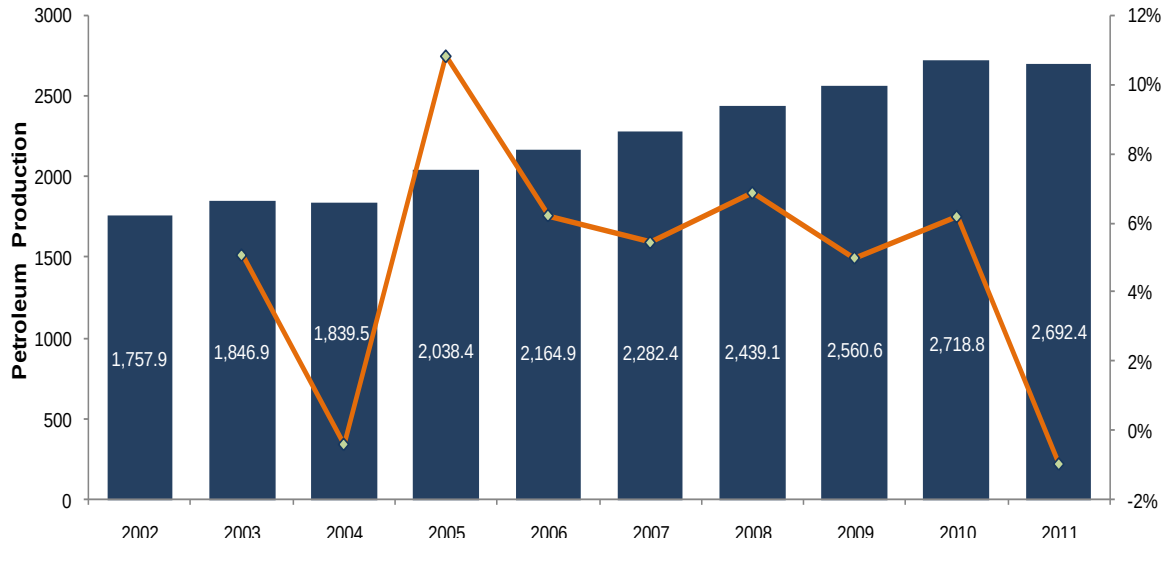
Figure 72: Brazilian Petroleum Consumption (Thousand Barrels Per Day), 2002–2011



Source: U.S. Energy Information Administration (EIA) and SDI analysis

8.3.16. Petroleum, Production

Figure 73: Brazilian Petroleum Production (Thousand Barrels Per Day), 2002–2011

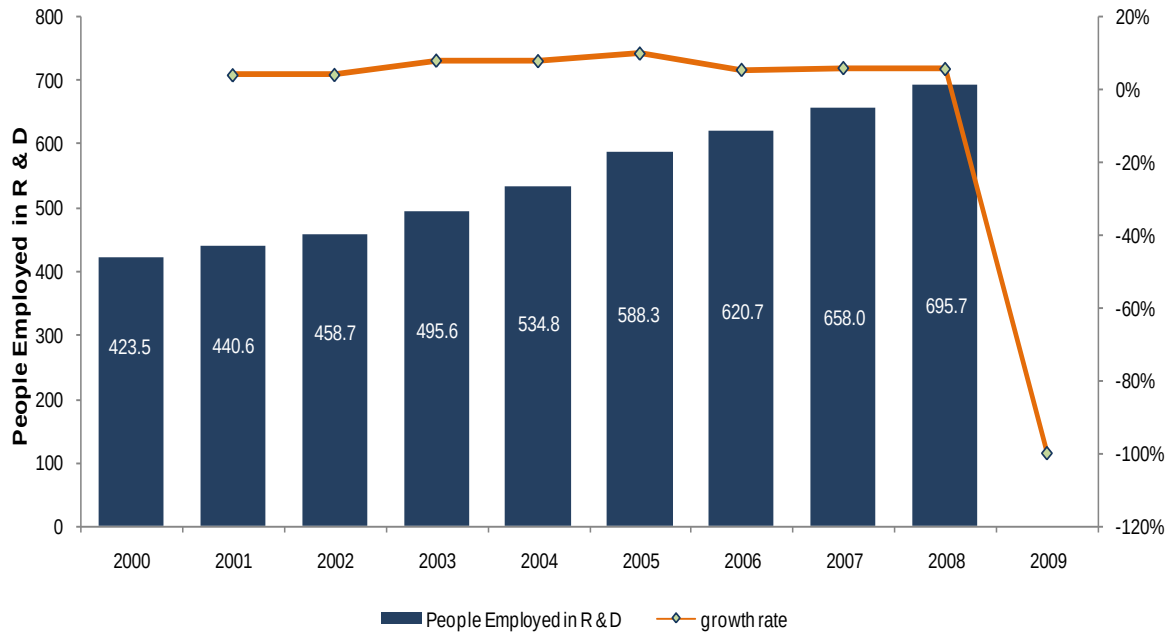


Source: U.S. Energy Information Administration (EIA) and SDI analysis

8.4. Labour

8.4.1. People Employed in R & D

Figure 74: Brazilian People Employed in R & D (Number of researchers per million people), 2000–2009

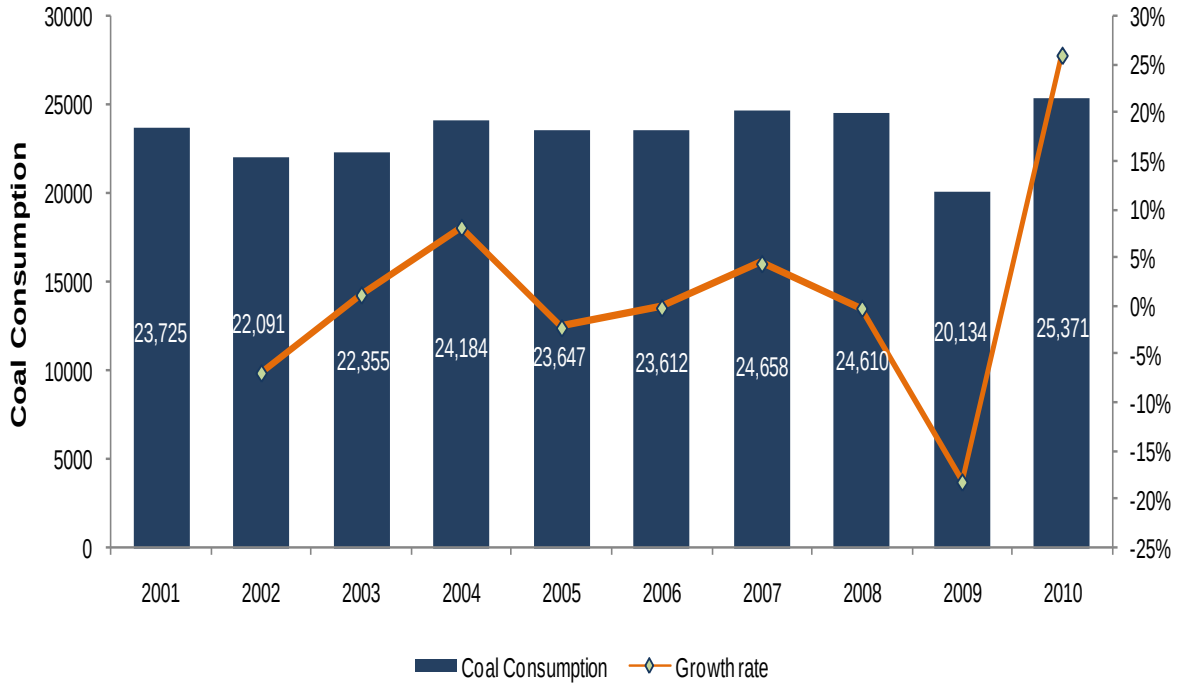


Source: US Energy Information Administration and SDI analysis

8.5. Minerals

8.5.1. Coal Consumption

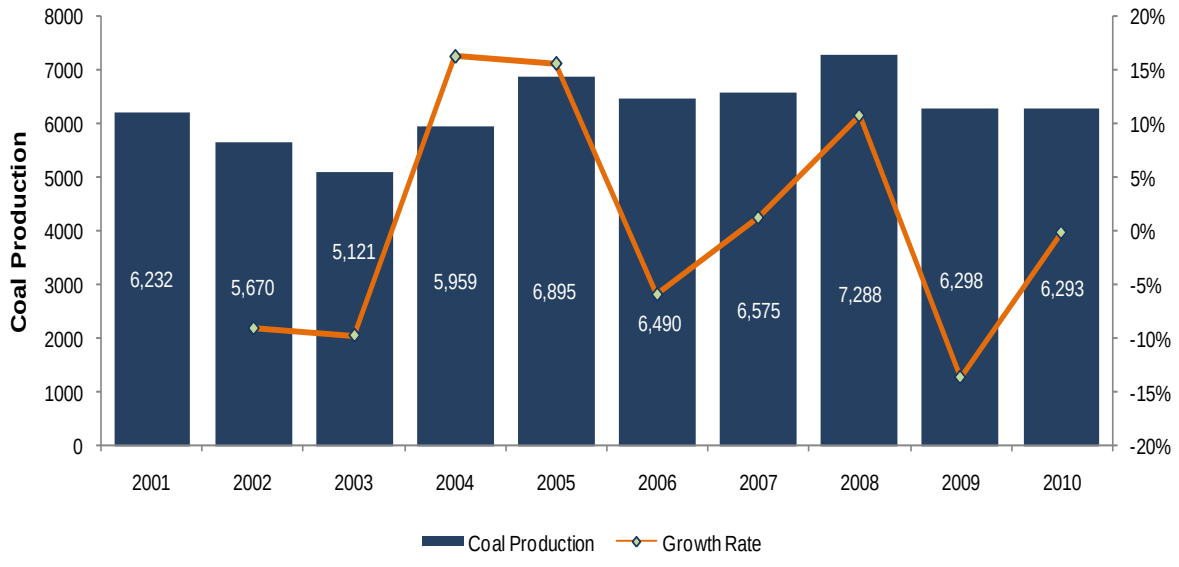
Figure 75: Brazilian Coal Consumption (Thousand Short Tons), 2001–2010



Source: US Energy Information Administration and SDI analysis

8.5.2. Coal Production

Figure 76: Brazilian Coal Production (Thousand Short Tons), 2001–2010



Source: US Energy Information Administration and SDI analysis

8.6. Social & Political Risk

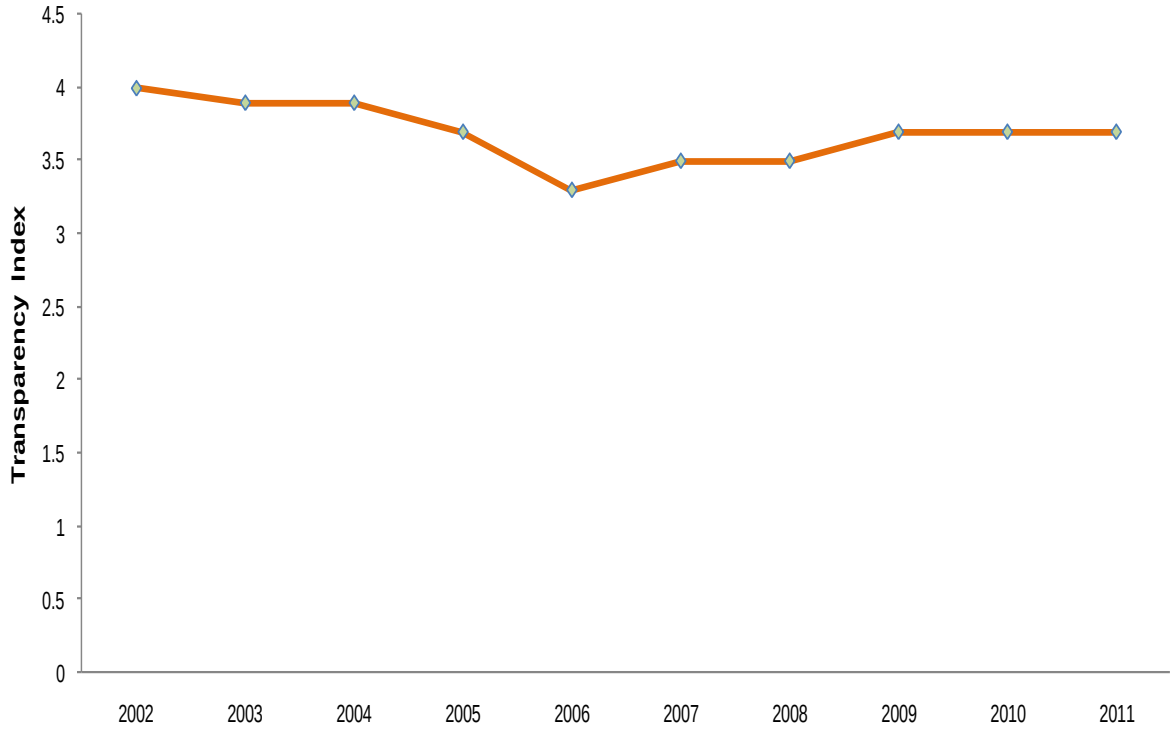
8.6.1. Political Stability Index

Figure 77: Brazilian Political Stability Index, 2002–2010

Source: The Worldwide Governance Indicators and SDI analysis

8.6.2. Transparency Index

Figure 78: Brazilian Transparency Index, 2002–2011



Source: The Worldwide Governance Indicators and SDI analysis

8.7. Technology

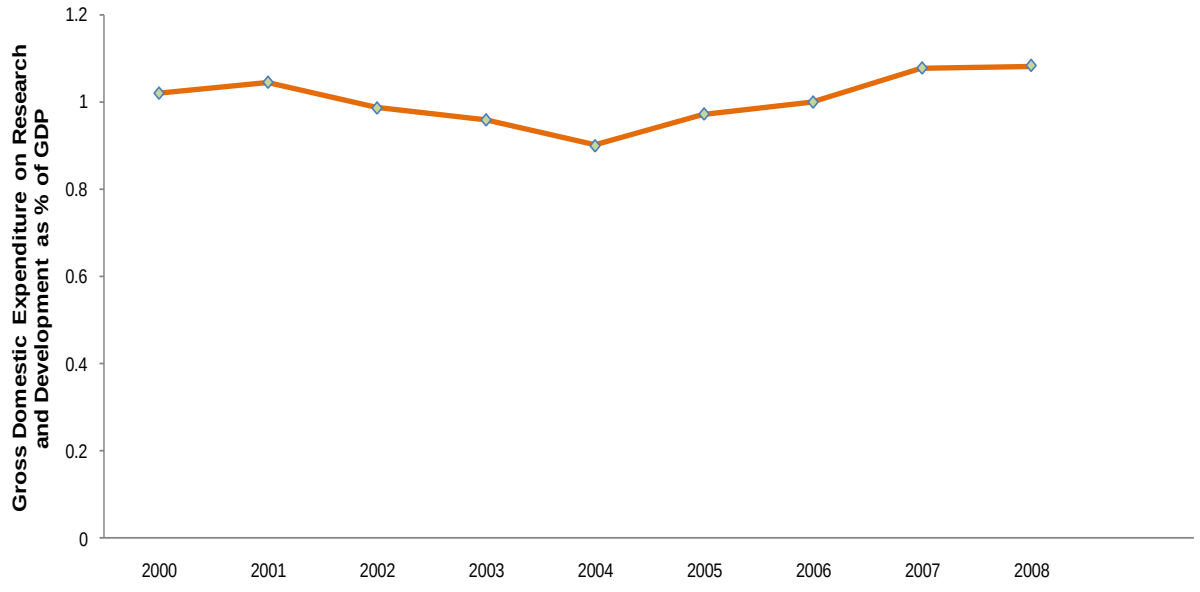
8.7.1. Fixed Broadband Internet Subscribers

Figure 79: Brazilian Fixed Broadband Internet Subscribers (Thousands), 2001–2010

Source: The Worldwide Governance Indicators and SDI analysis

8.7.2. Gross Domestic Expenditure on Research and Development as % of GDP

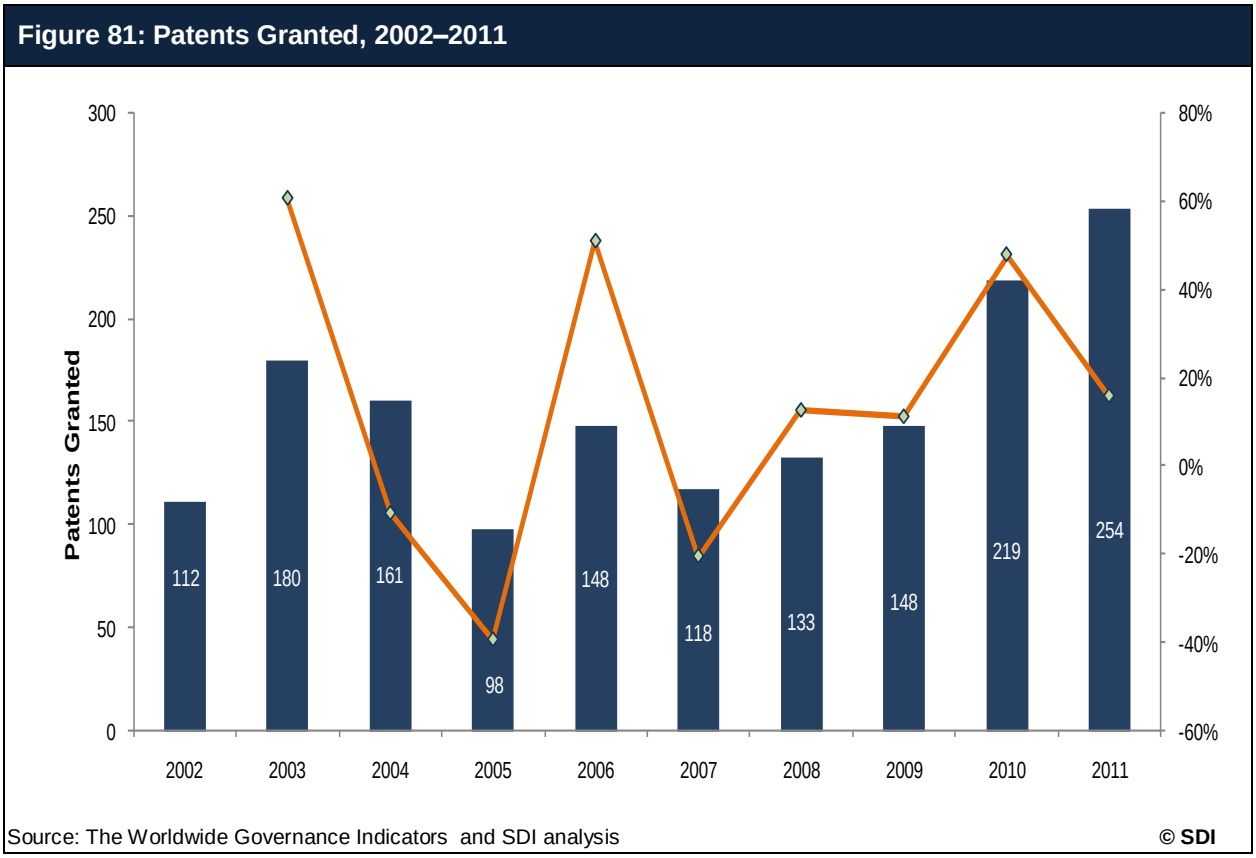
Figure 80: Gross Domestic Expenditure on Research and Development as % of GDP, 2000–2008



Source: The Worldwide Governance Indicators and SDI analysis

8.7.3. Patents Granted

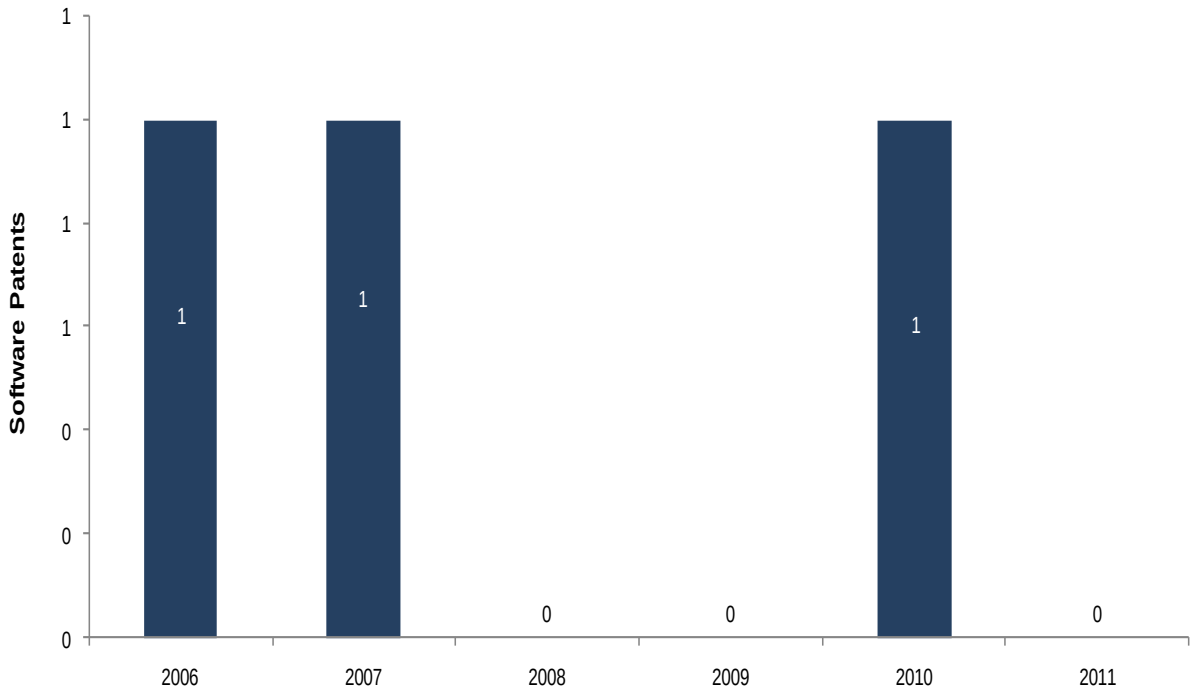
Figure 81: Patents Granted, 2002–2011



Source: The Worldwide Governance Indicators and SDI analysis

8.7.4. Software Patents

Figure 82: Software Patents, 2002–2011



Source: The Worldwide Governance Indicators and SDI analysis

9. Appendix

9.1. Contact Us

If you have any queries about this report or would like further information, please contact icdreports@progressivedigitalmedia.com

9.2. About SDI

SDI is a premium business information brand specializing in industry analysis.

9.3. Disclaimer

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