مجلس الأعمال السعودي الأمريكي
U.S.-Saudi Arabian Business Council

Defense, Security, and Aerospace

INDUSTRY REPORT

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Total population of Saudi Arabia **32.3 million**

2017 Nominal GDP **of $687.7 billion**

Total military **2017 spending**:

$69 billion

90% **of spending** went to foreign companies

Projected Impact of Defense on Saudi Arabia's GDP:

$61.7 billion 2020

$81.9 billion 2038

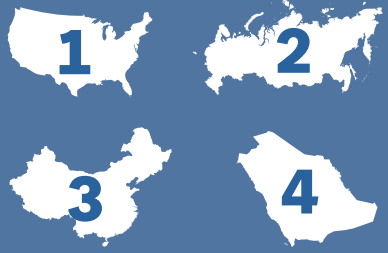
Cyber Security Spending

2017: $8 billion

2018: $15.4 billion

$110 billion of military deals with Saudi Arabia, will create **782,000 U.S. jobs** by 2025.

Saudi Arabia has the fourth largest allocated defense budget globally following the United States, Russia, and China.



Top areas for capital investment in surveillance: construction, power, and transport sectors.

Saudi Arabia has the largest market for aircraft parts in the Middle East.

Executive Summary

The United States and Saudi Arabia have the oldest and longest-standing defense relationship, entering an agreement of mutual defense assistance in 1951. Given this agreement and Saudi Arabia's Western-made weaponry, U.S. defense companies have a significant role in the Kingdom's defense sector. U.S. firms with a presence in the Kingdom – such as Lockheed Martin and Boeing – consistently rank among the top arms producing and defense services companies globally. Other top defense companies include Northrop Grumman, General Dynamics, BAE Systems, and Raytheon. There is an especially strong market for U.S. aircraft parts, and firms may increase their likelihood of procuring government contracts by first establishing a strong presence in the Kingdom.

Defense spending remains a significant contributor to the United States economy, totaling nearly $600 billion on an annual basis and accounts for over 3 percent of GDP. The United States is the world's top military spender, accounting for approximately 40 percent of global spending. Not only is the defense market vital for U.S. foreign trade, but it is also a key component of the U.S. economy, accounting for over 5 percent of U.S. manufacturing output. Our simulation results indicate that foreign military spending, as a result of the officially reported figure – $110 billion of military deals with Saudi Arabia, would create 782,000 U.S. jobs by 2025.

In 2017, the United States and Saudi Arabia both ranked among the world's top five defense spenders along with China, Russia, and India.[1] In recent years, Saudi Arabia has been the world's largest importer of weapons, and the Kingdom increased its military imports by 275 percent when comparing the five-year period of 2006-2010 to the following five-year period spanning 2011-2015.

Forecasts indicate that demand in the Saudi Arabian defense and security sector will expand at a compound annual growth rate (CAGR) of 1.48 percent through 2020 and at a CAGR over 1.71 percent over the next decade. We anticipate an increase in output from Saudi Arabia's defense sector; our forecasts show a 1.54 percent CAGR in output over the next decade.

Vision 2030 encompasses two key goals that are central to the defense sector. First, to establish a holding company for the military industry that is 100 percent owned by the Saudi government. The Saudi Arabian Military Industries (SAMI) was created in 2017 for the fulfillment of this goal and will be instrumental in advancing the Kingdom's defense industry capabilities, leading to new defense investments. The company will head consolidation of local companies and assets. The business units of the company align closely with Saudi Arabia's current capabilities and the country's future requirements.

Second, with regards to Saudi Arabia's diversification efforts, Vision 2030 calls for localized production in the defense sector through direct investment and the creation of strategic partnerships. Ultimately, Vision 2030 aims to promote technology transfer while building its national expertise. Developments in the sector include the expansion of private sector opportunities, increased budget allocations, and major agreements with foreign trading partners.

While Saudi Arabia aims to localize defense-related manufacturing, especially in the aerospace segment, the Kingdom must first establish a framework such that existing small businesses can enter a highly complex supply chain. Achieving domestic defense production through 2030 and beyond will require a large sum of capital for research and development, highly skilled Saudis to develop and engineer equipment and technology, and a newly formed supply chain.

Currently, Saudi Arabia is developing its local defense sector through joint ventures with foreign multinationals. These agreements provide the Kingdom with technology transfer, licensed production assistance, and joint training programs.

Opportunities have emerged in the market for personal and perimeter security products. A need for expertise in the area of cybersecurity also increases with the sophistication of threats. We expect the market for cybersecurity to be one of the fastest growing segments, expanding at a CAGR of 15.3 percent and reaching a market value of $5.1 billion by 2022.

Other areas of potential growth are additional contracts through technology transfer; growth and sustainment of local spare parts manufacturing; defense and security training programs; intelligence, surveillance, reconnaissance (ISR); and unmanned aerial vehicles.

In terms of growth, opportunities for U.S. companies exist in military aircrafts and parts, ground combat technologies, intelligence, surveillance and reconnaissance (ISR) as well as the naval platforms segment.

1 SIPRI Military Expenditure Database

Saudi Arabia

Introduction

Saudi Arabia invests heavily in its military and is expected to increase its military expenditure over the medium-term as new security risks and geopolitical threats remain. According to the Stockholm International Peace Research Institute (SIPRI), Saudi Arabia was the third largest military spender worldwide in 2017. In recent years, 90 percent of Saudi Arabia's military spending went to foreign companies. Indeed, as the largest economy in the Gulf and with an increasing trend of military spending, Saudi Arabia is one of the world's fastest growing markets for defense and security. Through Vision 2030, Saudi Arabia aims to develop its local defense industry, increasing the Kingdom's local purchases of military equipment to 50 percent. The Kingdom's local companies play an increasing role in the industry's training provision, electronics manufacturing, and maintenance, repair, and overhaul (MRO) activities. These local companies aim to expand their activities in these segments and to play a gradually collaborative role with research institutions on defense and engineering-related disciplines. Through its long-standing military relationships with arms suppliers in the United States and the United Kingdom, Saudi Arabia has procured the high-tech products it demands.

Saudi Arabia's continued and renewed investment in the sector – through the General Authority of Military Industries (GAMI) and Saudi Arabian Military Industries (SAMI) – as well as continued agreements with international firms and increasing efforts to establish joint ventures for the design, assembly, manufacturing and maintenance of military equipment support a strong sector outlook.

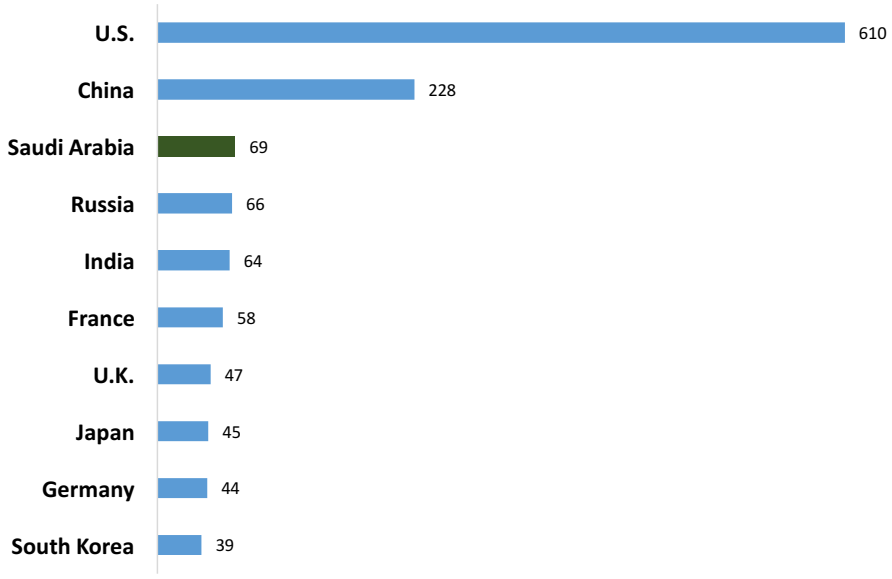
Historically, the Saudi Arabian defense sector has proven lucrative for foreign defense contractors given that the country is among the leading arms importers with limited but growing domestic capabilities, creating both short-term manufacturing opportunities and long-term support opportunities throughout the lifespan of vendor platforms that can last up to as long as 30 years.

In the coming years, we expect the Kingdom to progress towards its localization objectives though still with expanding opportunities for U.S. companies across the training services, cybersecurity, MRO activities, and command and control segments.

Budgetary Spending

Global military spending reached an estimated $1.74 trillion in 2017, the highest total amount since the end of the cold war. This total accounts for 2.2 percent of global gross GDP, and in real terms, a 1.1 percent annual increase in global spending from 2016. According to SIPRI data, Saudi Arabia's military expenditure increased by 74 percent between 2008 and 2015. Saudi Arabia has been among the biggest military spenders in the world, ranking in the top five globally in terms of total military spending. More recently, Saudi Arabia has also ranked as the largest importer of weapons worldwide. The country's total military spending

FIGURE 1: Top Military Spending, 2017 (USD Billions)



Source: USSABC, SIPRI Military Expenditure Database 2018

was estimated at $69.4 billion in 2017, making it the third largest spender following the United States and China.

The list of the world's top military spenders has remained consistent in 2016, though Saudi Arabia ranked as the fourth largest following the U.S., China, and Russia. According to the International Institute for Strategic Studies, Saudi Arabia's total defense spending declined at an average annual pace of 5.9 percent in 2016. This pattern is consistent with annual spending decreases across the Middle East with declines to military spending in Egypt, Bahrain, Oman, Kuwait, Israel, and Tunisia. However, in 2017 Russia's overall military spending declined by 20 percent, and Saudi Arabia once again ranked third – accounting for approximately 4 percent share of total global military spending.

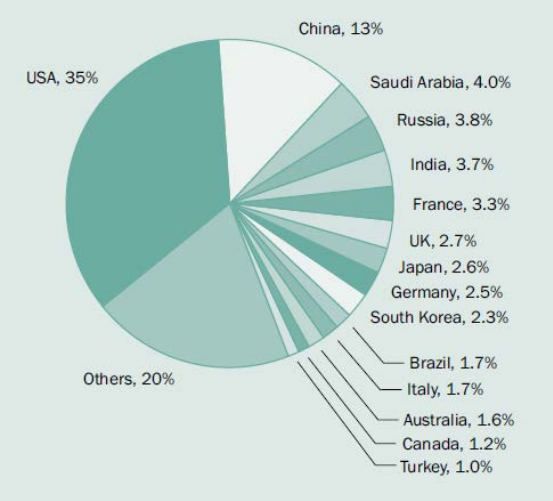
From 2016 to 2017, the Kingdom's military expenditure rose by 9.2 percent to an annual estimate of $69.4 billion, or approximately 10 percent of the country's GDP.[2]

Saudi Arabia's military spending was the second largest categorical spending within the country in both 2016 and 2017, following education. According to the most recent data that is available for international comparison of defense spending, Saudi Arabian defense expenditure was approximately 10.4 percent of GDP, the second largest percent of GDP in the world after Oman.[3]

Given these geopolitical forces, easing of austerity measures amid rising oil prices in 2018, and the Kingdom's robust military budget, we forecast Saudi Arabian military expenditure to advance through 2027. As shown in the defense expenditure forecast figure, we expect this annual figure to approach $100 billion over the next decade.

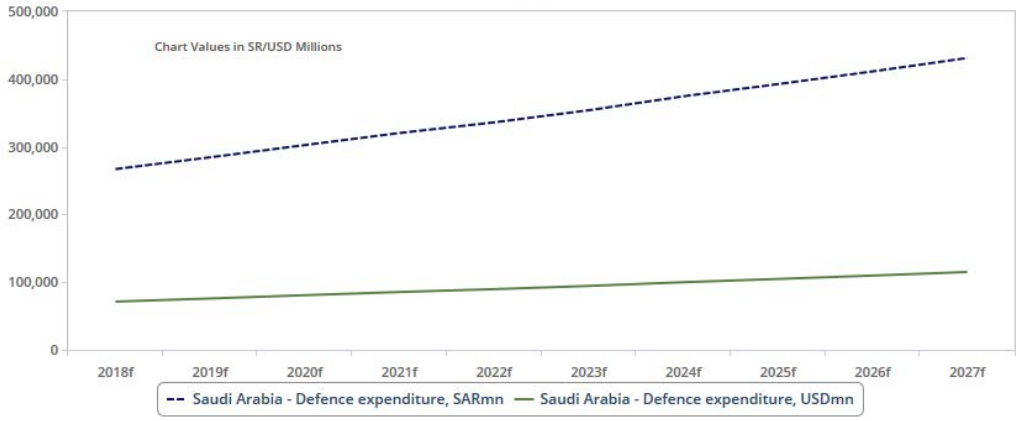
In 2018, Saudi Arabia announced a defense budget of $56 billion (SAR210 billion), with defense and military accounting for 21.5 percent of the Kingdom's total $261 billion (SAR978 billion) spending plan. This allocation is 10.5 percent greater than the 2017 budgetary allocation of $50.7 billion (SAR190 billion). This is the fourth largest allocated defense budget globally following the United States, Russia, and China.

FIGURE 2: Share of World Military Expenditure, 2017 By 15 Largest Global Spenders



Source: SIPRI Trends in World Military Expenditure, 2018

FIGURE 3: Saudi Arabian Defense Expenditure Forecast 2018-2017

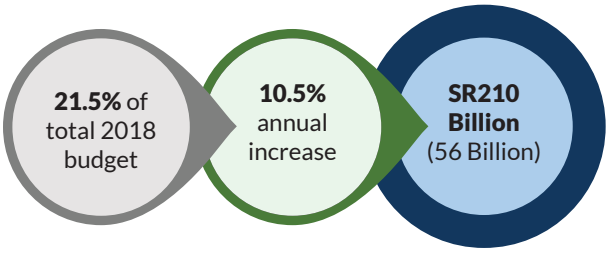


Source: USSABC, BMI Research, U.S. Department of State

2 SIPRI Military Expenditure Database, 2017. The estimate for percentage of GDP is based on 2017 GDP from the IMF World Economic Outlook and International Financial Statistics databases.

3 SIPRI Military Expenditure Database 2017.

FIGURE 4: Saudi Arabia's 2018 Military Budget



Source: USSABC

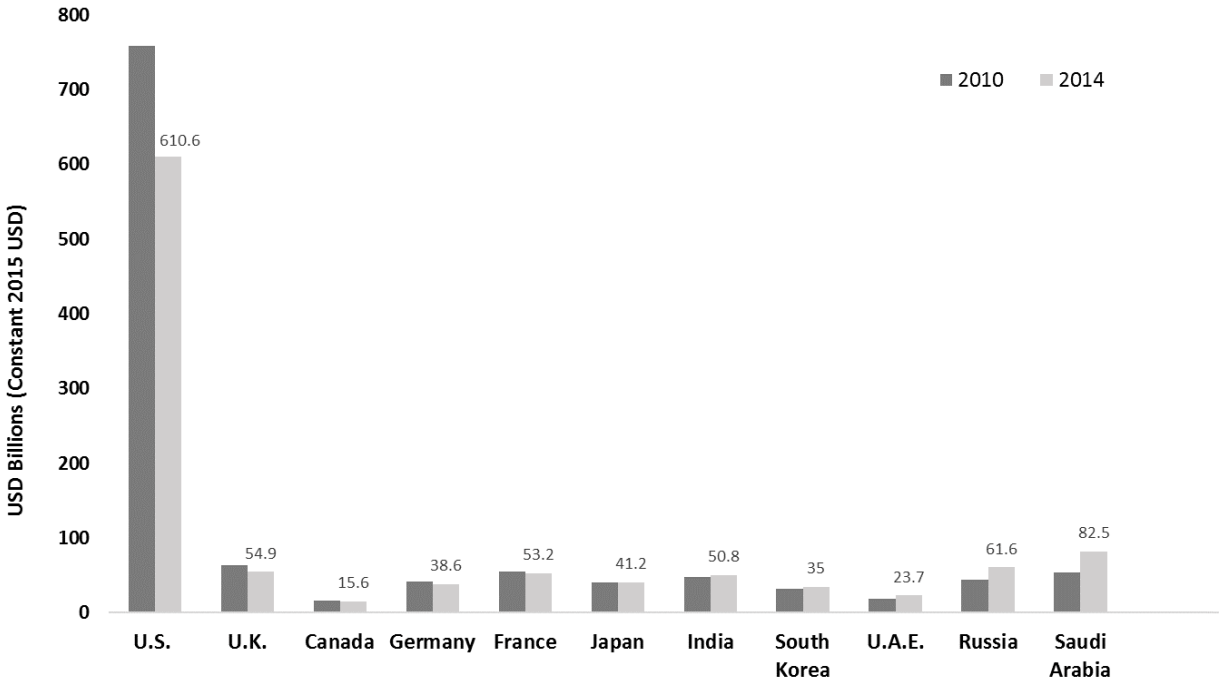
The Kingdom's military spending plan designates specific amounts to particular areas of development. For instance, $7.1 billion (SAR26.5 billion) was tagged for military medical services, $2.7 billion (SAR10.2 billion) for creating advanced systems, and $933 million (SAR3.5 billion) for military colleges. The 2018 spending plan designated approximately 5 percent for the development of new programs and projects.

Separately, Saudi Arabia categorizes security activities into its own budget category, Security and Regional Administration Spending, which received $26.9 billion (SAR101 billion) under the 2018 budget. Security spending includes provision of security equipment and facilities, as well as weapons and ammunition. A portion of this funding is also designated towards medical cities. These activities account for 10.2 percent of the total spending plan and this allocation marks a 4.2 percent rise from 2017's allocation.

Regional Comparison of Defense Spending

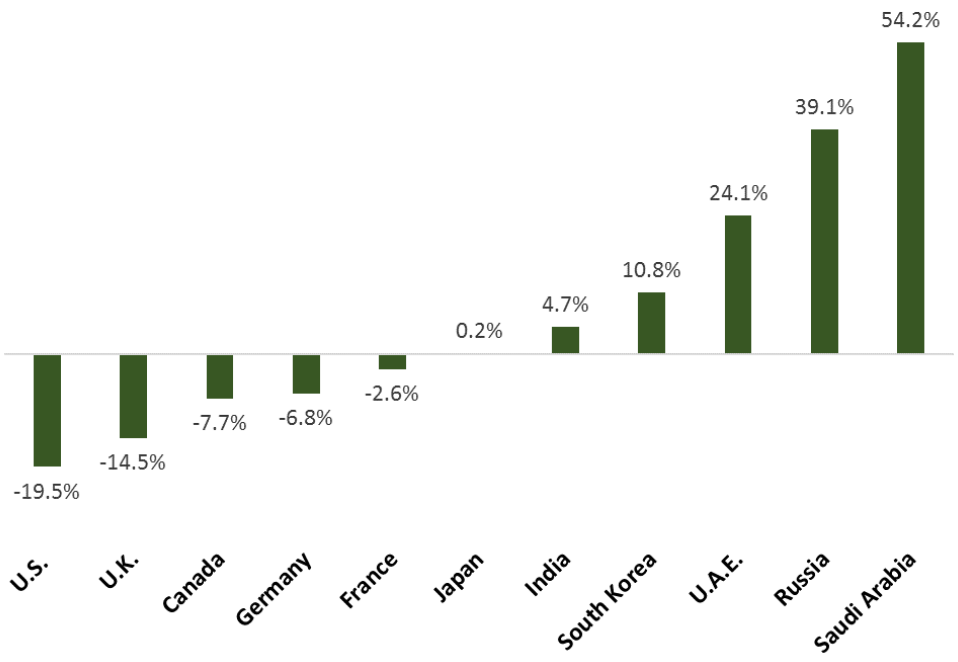
As shown in the figures below, the historically powerful defense markets in North America and Western Europe – such as the United States, United Kingdom, France, Germany and Canada – have witnessed decreased spending. Meanwhile a comparison of historical data over the period 2010-2014 shows that defense markets in the Gulf, Eastern Europe, and Asia have sustained steady expansion.

FIGURE 5: Defense Expenditure by Country, 2010 and 2014 Comparison



Source: USSABC, SIPRI Military Expenditure Database 2017

FIGURE 6: Growth in National Miltary Expenditure by Country, 2010-2014



Notes: Percentage change calculated based on spending at constant USD prices.
Source: USSABC, SIPRI Military Expenditure Database 2017

As shown in the figure above, the defense markets in Saudi Arabia and the U.A.E. are among those that have witnessed the fastest global growth. Defense markets in Asian nations including Russia, South Korea, India, and Japan have also experienced expansionary trends.

Between 2008-2017, six countries (Australia, China, India, Russia, Saudi Arabia, and Turkey) had military expenditure increases of over 30 percent. Brazil, Canada, and South Korea had military spending increases between 10 and 30 percent; and Japan, France, and Germany had increases between 0 and 10 percent. Meanwhile, military expenditure for Italy, the United Kingdom, and the United States declined over this period, with U.S. expenditures decreasing by 14 percent.

While some defense contractors already participate in limited offset arrangements with Saudi Arabia, the Kingdom is now requesting that foreign contractors expand their knowledge-transfer opportunities to include greater technology transfer while also taking on a greater role and expanding training options. One example of such an agreement is a joint venture between Northrop Grumman and Saudi Arabia for the design and technology transfer surrounding high-end security systems to protect critical infrastructure. As part of this agreement, U.S. developed technology may be accessed and altered by Saudi engineers from certain Saudi defense-related enterprises. Another example is an agreement between Saudi Arabia and BAE Systems for the provision of IT technology, electrical engineering expertise, and military and industrial development training.

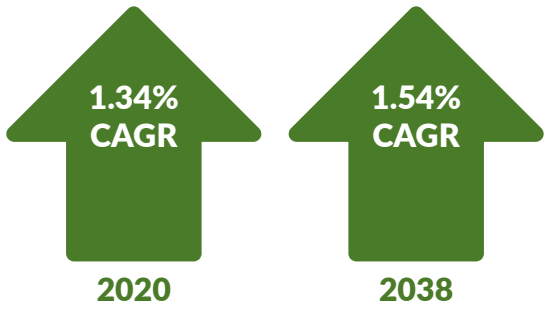
Macroeconomic Forecasts

We forecast Saudi Arabian defense sector demand to increase at a compound annual growth rate (CAGR) of 1.48 percent through 2020. Over the long-term, we expect annual demand growth at a slightly higher pace of 1.71 percent through 2038.[4]

The Saudi Government aims to reduce the country's reliance on foreign sources for its security requirements through development of its own human capital, capacity-building transformation, and research and development efforts to advance technological capabilities – particularly in high-tech and armaments.

In terms of sector output, we forecast short-term output growth of 1.34 percent through 2020. Through 2038, we expect output growth of 1.54 percent. Output is defined as the amount of sector production, including all intermediate goods purchased as well as value added through compensation and profit and can be considered as sector supply.

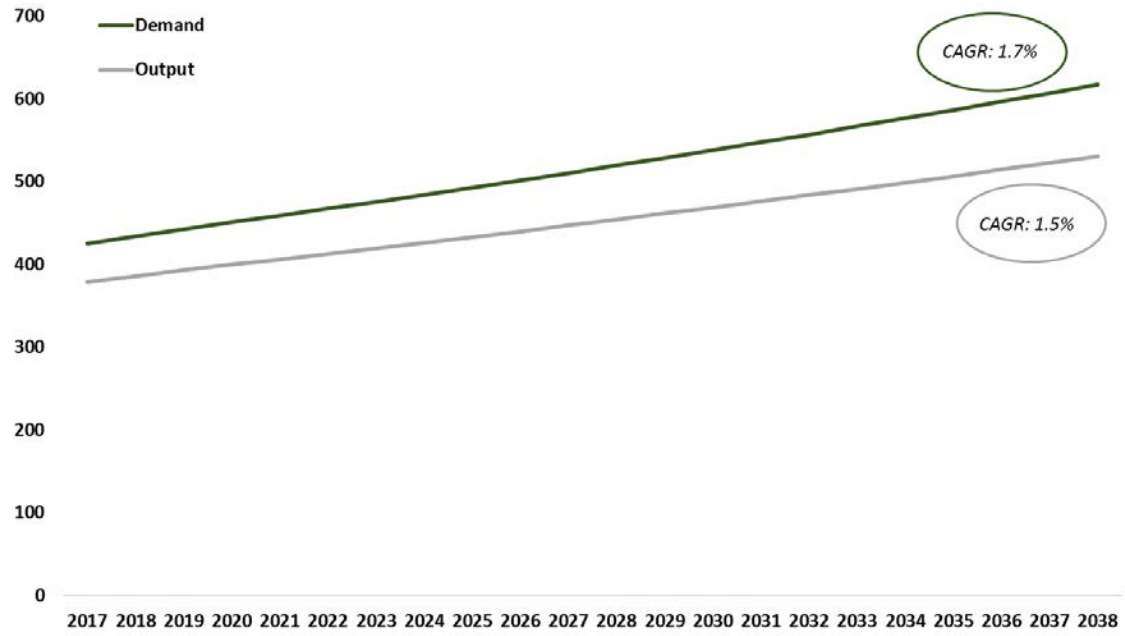
FIGURE 7: Saudi Arabian Defense Sector Output Growth



Source: USSABC, REMI

Unsurprisingly, government expenditures are the primary driver for the majority of sector demand. In particular, of the total demand in 2017, 88 percent ($382.7 billion) originated from government demand while 3 percent ($10.3 billion) originated from local consumption demand for consumer goods, and 9 percent ($39.2 billion) originated from intermediate demand – material inputs to the production of final goods.

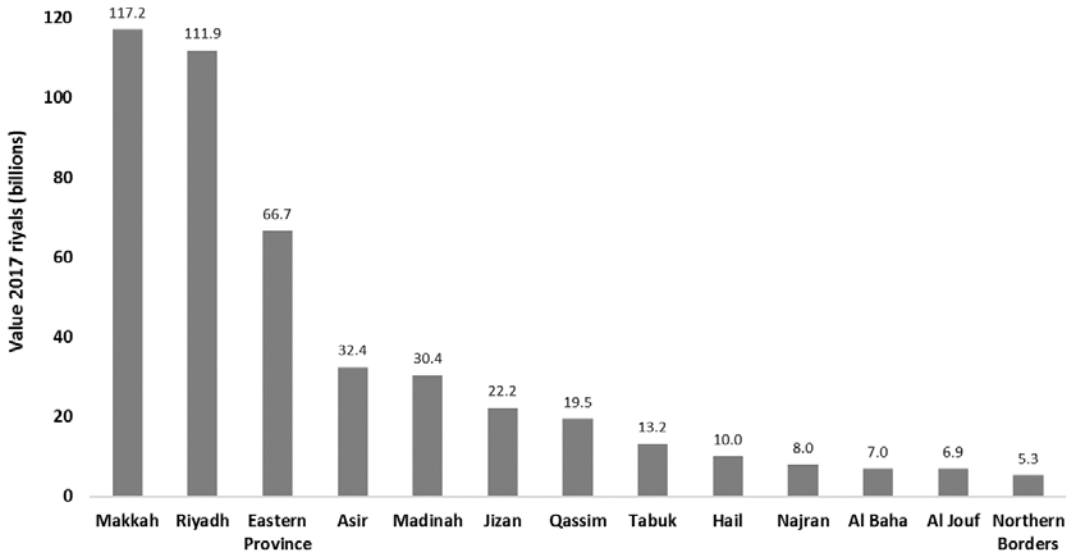
FIGURE 8: Saudi Arabian Defense Output and Demand, National Forecast, 2017-2038



Source: USSABC, Regional Economic Models, Inc.

4 Forecasted data is based on the economic input-output model developed by Regional Economic Models, Inc.

FIGURE 9: Defense and Securoty Demand by Region, 2020 Forecast

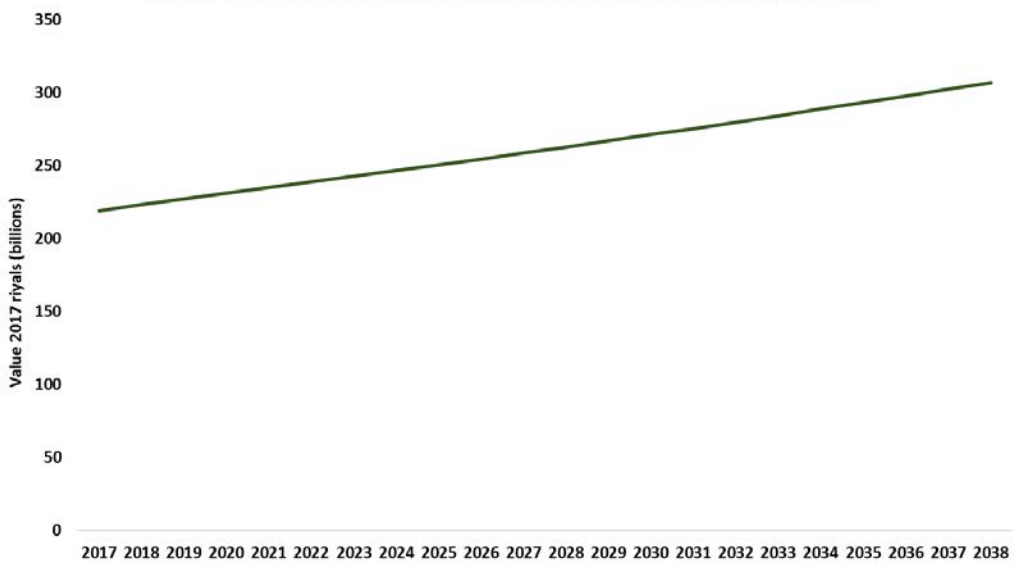


Source: USSABC, Regional Economic Models, Inc.

Regionally, demand for defense and security is highest in Makkah, followed by highly populated and industrial regions such as Riyadh and the Eastern Province. Projections indicate that Asir and Jizan will have a sizable continued defense demand through 2020 given the conflict across the southern border.

Defense activities make a significant contribution towards Saudi Arabia's GDP. By 2020, we forecast that the impact of the defense sector will be $61.7 billion (SAR231.2 billion) and will reach $81.9 billion (SAR307 billion) by 2038.

FIGURE 10: Contribution of Defense Activities to Saudi Arabian GDP, National Forecast, 2017-2038



Source: USSABC, Regional Economic Models, Inc.

Regional Purchase Coefficient

The proportion of goods and services purchased from domestic producers and suppliers, the regional purchase coefficient, is projected to decline, suggesting an increasing reliance on foreign goods and services in the sector. This is not necessarily at odds with Saudi Arabia's goals for localizing the sector. Other than for utilities and petroleum production, the regional purchase coefficient for defense is among the highest of all sectors given Saudi Arabia's strength of existing military expertise, infrastructure, and local military companies. As Saudi Arabia continues to expand its expertise, it may initially have an upfront need for foreign services, such as provisions for training, research, and development. Consequently, as Saudi Arabia aims to increase localization, establishing new contracts and strategic partnerships with foreign suppliers will boost the Kingdom's own military technology production capabilities.

BMI Risk/Reward Index

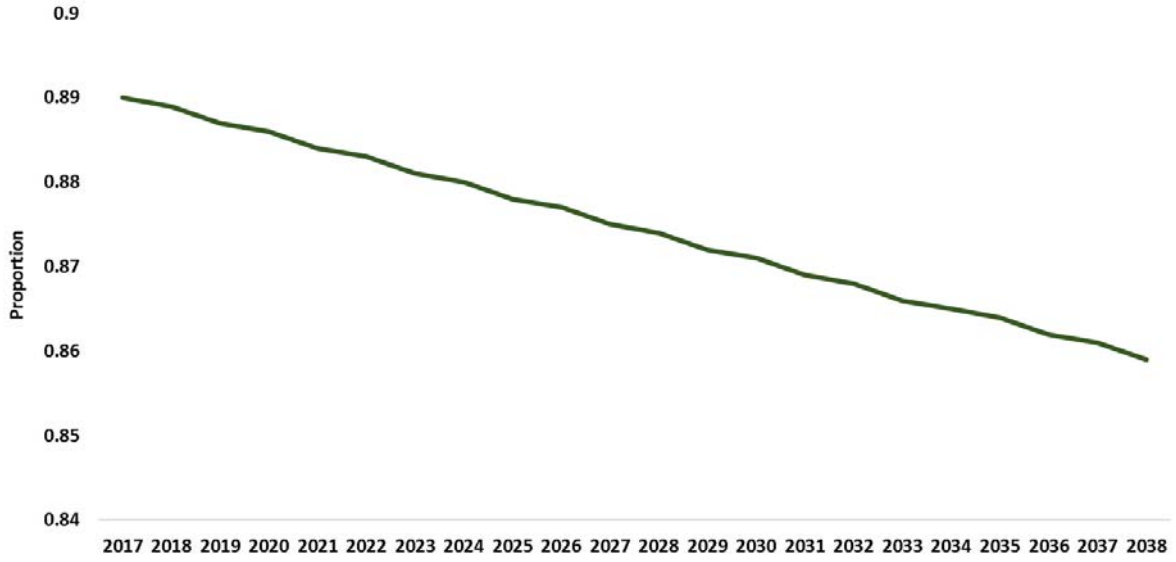
In 2017, BMI Research gave Saudi Arabia a rewards rating of **45.2** and a risk rating of **63.3**. The risk/rewards index for 2017 was **52.5**, a relatively good operational environment for the MENA region.[5]

The reward measure evaluates the sector's size and growth potential in each state, along with broader industry/state characteristics that may inhibit its development with a rating. The rewards index for defense takes into account both industry-specific and wider country-specific rewards, including elements such as defense exports, interstate-security, macroeconomic conditions and international relations.

The risk measure considers industry-specific dangers and those emanating from the state's political and economic profile that call into question the likelihood of anticipated returns being realized over the forecast period.

Finally, the Defense Risk/Reward Index evaluates the challenges of operating within Saudi Arabia. It uses data from a multitude of defense, macroeconomic and political sources to generate scores to assess defense industry performance in a country.

FIGURE 11: Saudi Arabian Defense Regional Purchase Coefficient Forecast, 2017-2038



Source: USSABC, Regional Economic Models, Inc.

5 Metrics are constructed on a scale of 0-100, such that 0=worst and 100=best.

Employment

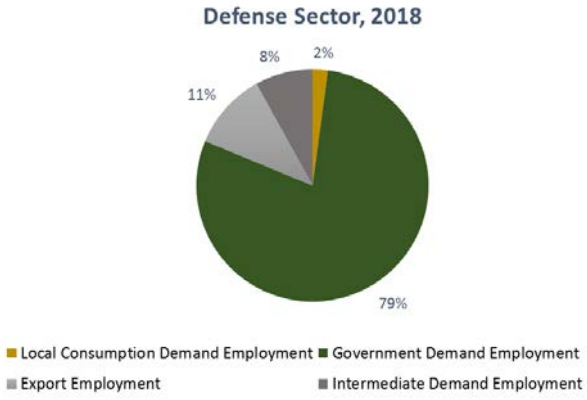
Local employment in the defense sector is expected to grow steadily at a 1.3 percent CAGR. Varying types of employment opportunities are generated by the defense sector –by government, private sector, and local manufacturing.

In 2018, the public administration and defense sector is expected to generate an estimated 2.20 million private sector jobs. By 2028, this number will grow to approximately 2.52 million private sector jobs.[6]

Most of the private sector jobs created by defense sector spending (79 percent) satisfy demand for goods and services by government expenditures. The second largest creator is export employment.

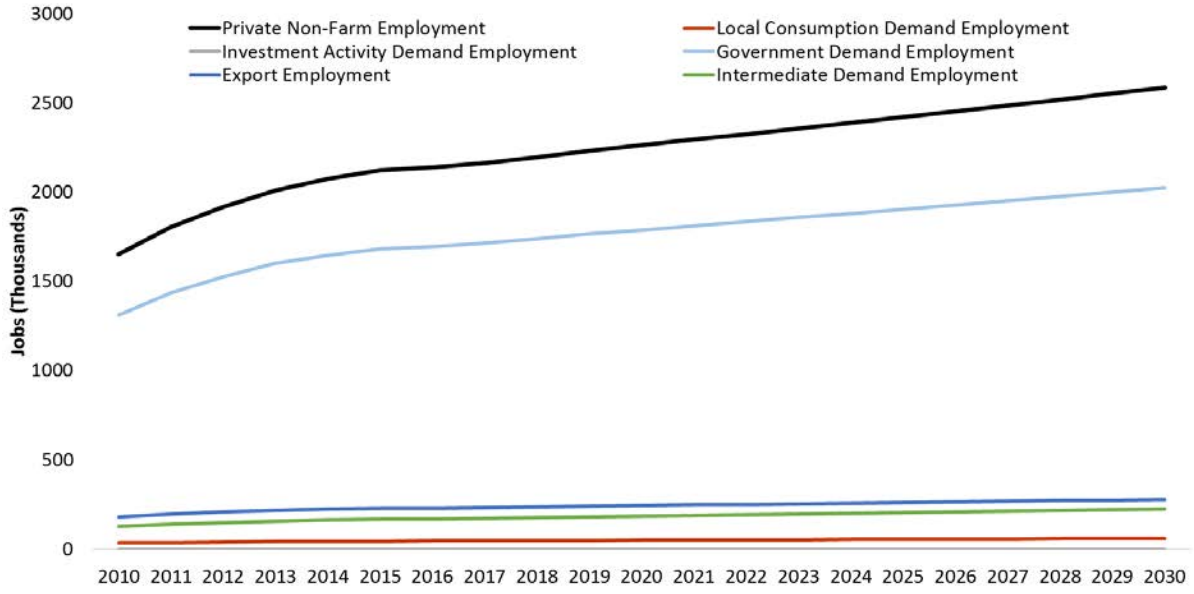
FIGURE 12: Defense Sector Contribution to Saudi Arabian Private Sector Job Growth, 2018-2030

FIGURE 13: Saudi Arabian Private Sector Employment by Demand Activity



Source: USSABC, Regional Economic Models, Inc.

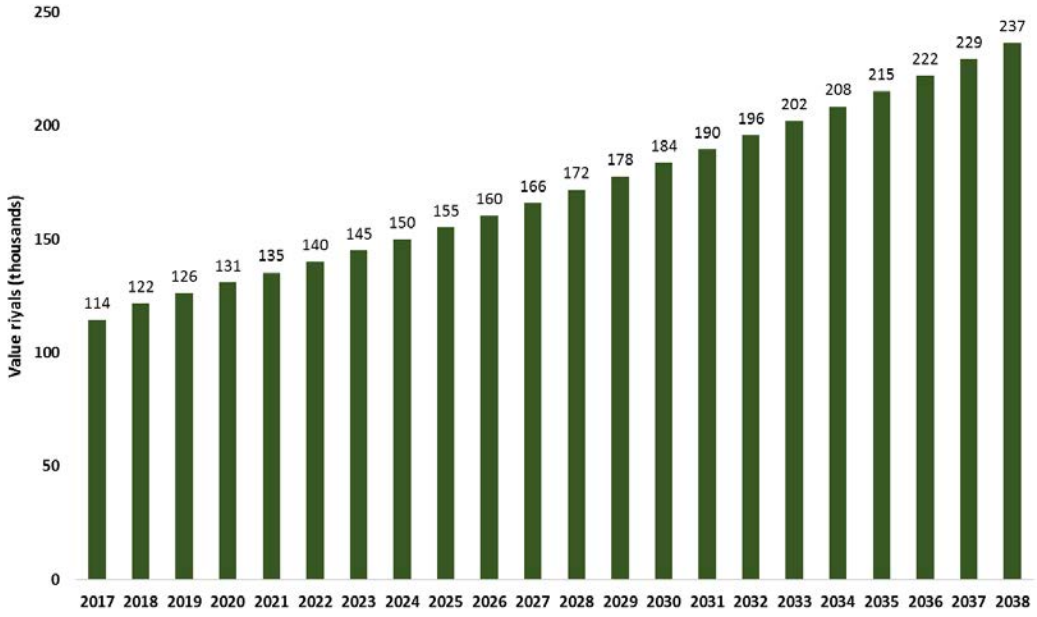
FIGURE 14: Public Administration and Defense: Private Employment by Demand Activity



Source: USSABC, REMI

6 Based on economic input-output model forecasts.

FIGURE 15: Saudi Arabian Average Annual Wage Rate - Public Administration and Defense, 2017-2038



Source: USSABC, Regional Economic Models, Inc.

Saudi Arabia provides additional support to military personnel. For instance, in January 2018, a royal decree issued measures to ease any additional financial burden associated with the new VAT. The order included an annual bonus and monthly cost-of-living stipend for military personnel as well as a payment of SAR5,000 to military employees stationed along the southern borders. Saudi Arabia's average annual wage rate is expected to increase by 3.4 percent through 2038.

Creation of new private-sector job opportunities for Saudi citizens emerges as a theme in Vision 2030 that holds true respective to localization goals in the defense, security sector, and aeronautics sector. Indeed, the transformation already taking place in the Kingdom requires more advanced technical training as companies aim to boost local manufacturing and expand the offerings of maintenance, repair, and overhaul activities. Aligned with the goal to develop partnerships that allow Saudis to gain technical and professional skills, the Technical and Vocational Training Corp (TVTC) partnered with Alsalam to provide training for 500 Saudi high school graduates, in 2017. The specialized training will afford these workers the aerospace manufacturing and repair capabilities needed to eventually oversee projects for Alsalam.

Defense contractor creation of workforce training programs in Saudi Arabia may allow for more local production through increasing the supply of regional expertise and may also help companies reduce costs. Thus, the creation of joint ventures or establishment of training programs enables local procurement and helps to control labor costs and expenditures across the supply chain.

As part of Lockheed Martin's long relationship with Saudi Arabia, the company has created a program for educating young Saudi engineers and professionals in collaboration with Alfaisal University and the King Abdullah University of Science and Technology (KAUST). Lockheed Martin also partnered with Babson College to create Babson Global, Inc. Center for Entrepreneurial Leadership (BGCEL). BGCEL was formed under the Saudi Economic Offset Program and is based at the Prince Mohammed Bin Salman College (MBSC) at the King Abdullah Economic City (KAEC).

BGCEL intends to advance the entrepreneurial ecosystem within Saudi Arabia through innovative programs on SME enterprises, entrepreneurship of women, and start-ups.

Boeing has also become involved with engaging students in research and development projects through KAUST. The goals are to not only develop human capital to effectively operate existing defense systems, but also to develop the next generation of innovators.

With involvement from U.S. companies in developing Saudi Arabia's local defense expertise, Saudi Arabia's labor productivity for manufacturing is anticipated to grow at one of the greatest long-term rates among industries, with a CAGR of 1.83 percent through 2030.[7]

FIGURE 16: Saudi Arabian Manufacturing Labor Productivity Increase, 2018-2030

Source: USSABC, REMI

7 REMI econometric input-output (IO) forecasting model for Saudi Arabia.

Vision 2030 and National Transformation Program Defense Priorities

Localization

A key theme of the Vision 2030 is increased localization of expertise. Saudi Arabia aims to increase military procurement inside the Kingdom from 2 percent to 50 percent by 2030. Consequently, industry executives note an interim goal of 20 percent localized procurement.

In the past, Saudi Arabia's local manufacturing capabilities have been limited to armored vehicles, ammunition, and spare parts. One of Vision 2030's objectives is to shift away from local manufacturing that does not involve complex processes and intends to develop an integrated local industry that can manufacture high-value military equipment.

In line with this strategy, contracts with foreign suppliers, strategic partnerships, and funding of research facilities will continue to be key focuses for development of the Kingdom's defense sector. Long-term localization will require Saudi companies to manufacture highly complex processes of design and production of hardware. In the short term, localization will likely require establishing JVs between international defense equipment manufacturers and Saudi firms, especially for assembly and repair.

There are myriad examples of foreign companies engaged in Saudi localization efforts, especially over the last few years. In 2015, Boeing, Alsalam Aerospace Industries, and Saudi Aerospace Engineering Industries (SAEI) set up a facility in Saudi Arabia for the maintenance, repair, and overhaul (MRO) of helicopters. In 2016, a joint venture between the defense manufacturer Rheinmetall Denel Munition (jointly owned by Rheinmetall of Germany and Denel of South Africa) and Military Industries Corporation (MIC) launched a weapons factory within Saudi Arabia specializing in the production of artillery shells. In 2017, BAE Systems announced that, as part of an agreement for 22 Hawk training jets, the company would create a final assembly line production facility within Saudi Arabia.

Saudi Arabia has shown its willingness to continue doing lucrative business with U.S. companies that have assisted localization efforts in the Kingdom, providing the indirect benefit of other future contracts. For instance, as of May 2018, Boeing will provide eight CH-47F Chinook helicopters to Saudi Arabia through a $25.7 million FMS contract from the U.S. Army Contracting Command for the Royal Saudi Land Forces Aviation Command.

Saudi Arabia offers cheaper fuel and tax incentives as direct benefits to producers in the Kingdom. There is also a high abundance of raw materials such as aluminum and steel needed in the supply chain of defense equipment. For aircraft services, Saudi Arabia has a regional advantage as a sole service hub between Europe and India.

However, industry executives underscore that for the localization effort to be successful, there needs to be emphasis on building a stronger supply chain. They also note that current infrastructure for localization should be prioritized. Furthermore, there is a need to acquire plants and equipment as well as develop domestic technical expertise to manage these facilities.

Although the Saudi Government seeks to advance the local defense-manufacturing base, these opportunities are not expected to manifest immediately but rather in the long term. Empirically, Saudi Arabia's defense research and production has needed private sector involvement. Instead it has leaned heavily on multinational defense firms.

In May 2018, Saudi Arabia established the Aircraft Accessories and Components Company (AACC) aiming to increase the sector's job localization rate through 2020 by way of expanding maintenance, repair, and overhaul (MRO) activities. Headquartered at King Abdul Aziz International Airport, AACC reported that it has already expanded its expertise to perform maintenance on the largest commercial aircrafts. These include Boeing 777, Airbus 320 and 380, in addition to signing several deals for new civilian and military MRO activities.

Steps to localize defense manufacturing can be seen in supply contracts between the Ministry of Defense (MoD) and defense contractors. Shortly after the launch of Vision 2030, the MoD required defense contractors to provide for the local manufacture of certain elements of supply contracts. Consequently, defense contractors and suppliers may be required to visit Saudi Arabia to identify partners that can manufacture spare parts and other elements of supply contracts that meet MoD standards and specifications.

Creation of GAMI and SAMI

Saudi Arabia established the General Authority of Military Industries (GAMI) in H2 2017 that will oversee regulation of the military industry and will support the Kingdom in achieving its sector-related Vision 2030 objectives. GAMI proposes new policies, strategies, and regulations that are relevant to the military industry and complementary sectors. GAMI also manages the military procurement operations of arms, ammunition, equipment, supplies, military uniforms, maintenance and operation contracts for arming the security and military authorities.

In 2017, Saudi Arabia's Public Investment Fund (PIF) announced the launch of Saudi Arabian Military Industries (SAMI), a new state-owned military industrial company. According to the PIF, SAMI aims to contribute more than $3.7 billion (SAR14 billion) to GDP and to create over 40,000 new jobs by 2030. According to the official statement, the goal is for SAMI to become one of the world's top 25 defense companies by 2030. The Saudi government plans for the defense holding company to restructure military manufacturing and play a pivotal role in boosting the defense sector's domestic capabilities.

ROLE OF SAMI

It is envisaged that SAMI would become the central offset partner for Western defense groups and the backbone of Saudi Arabia's military-industrial complex. Moreover, SAMI's creation was a move to consolidate the Kingdom's defense sector.

Presently, SAMI has taken the lead in procurement procedures for the Ministry of Defense – both cooperating with existing local military companies and creating new business units to ensure alignment with the latest developments. SAMI is charged with manufacturing products and providing services that complement the Kingdom's future military requirements. Accordingly, the organization leads the Kingdom's defense sector in the establishment of companies through joint ventures with leading global equipment manufacturers.

SAMI has emphasized its role in partially localizing military expenditures within Saudi Arabia through manufacturing components of military packages. To expand the localization of military production, industry experts have noted that this would require building the Kingdom's institutional capacity to manage the production locally and to successfully execute technology transfer. In some capacity, SAMI's creation is a response to a need for capacity building. To finance its goals, SAMI has started vetting candidates for foreign financing, including U.S. defense groups.

Saudi Arabian Armed Forces

Saudi Arabia's military force is one of the largest and best-equipped in the region, with over 200,000 active personnel. The National Guard focuses on countering internal threats and is comprised of over 100,000 personnel.

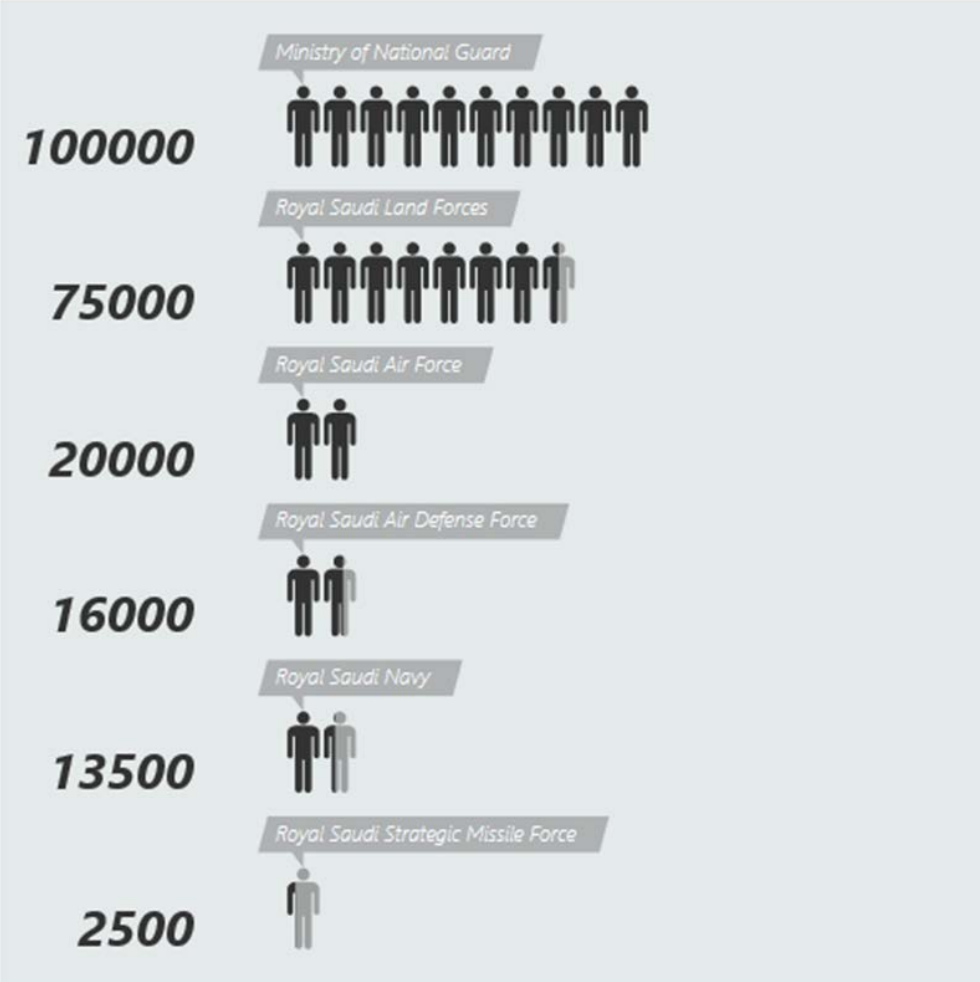
The MoD is responsible for overseeing Saudi Arabia's Air Force, Army, and Navy. Other military entities include the Saudi Arabian Army, Royal Saudi Air Force, Royal Saudi Navy, Royal Saudi Air Defense, and Royal Saudi Strategic Missile Force. (See appendix for other military entities and companies)

International Trade and Investments

The defense sector is not a significant contributor to Saudi Arabia's exports. However, the Kingdom's efforts to increase foreign investment through domestic defense companies and improvements to Saudi Arabia's operational environment has the potential to lead to long-run growth, especially in defense electronics.

Currently, the majority of local manufacturers focus on licensed production, maintenance repair, and overhaul activities of North American and European equipment being used by the Kingdom's armed forces. As far as local companies involved in the creation of new products, most activities are limited to segments such as small arms and munitions, defense electronics, and armored vehicles.

FIGURE 17: Saudi Arabian Armed Forces



Source: USSABC, International Institute for Strategic Studies

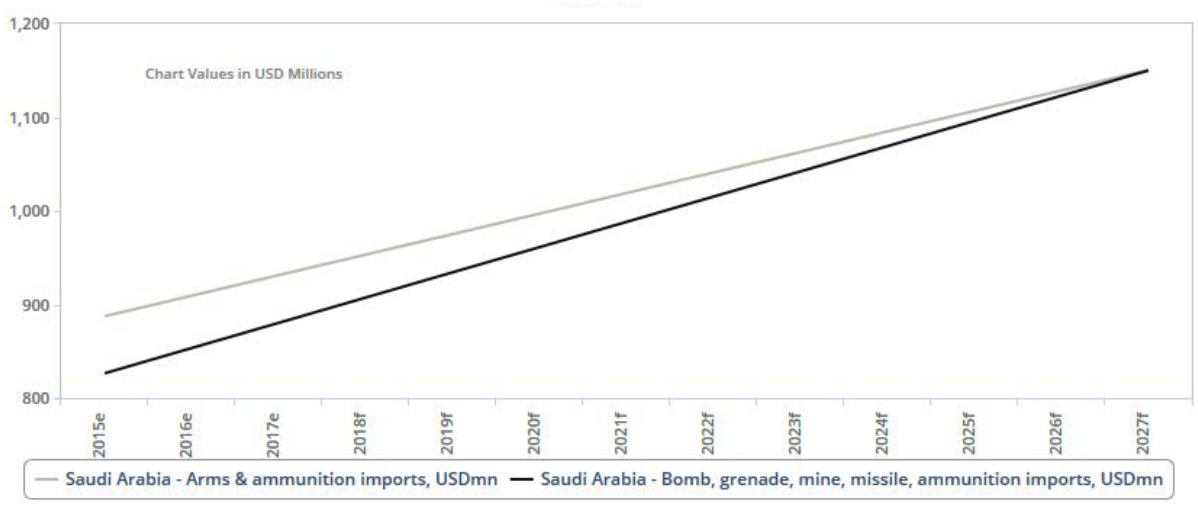
In recent years, the Saudi Arabian government was the world's third largest spender on security and military requirements, yet over 90 percent of this spending is transacted with foreign companies. U.S. companies have supplied the largest amount of defense articles to the Saudi Arabian armed forces, though a large portion of the Kingdom's defense procurement have also come from the United Kingdom, Germany and France.

The forecast chart for Saudi Arabian defense imports shows the value of the Kingdom's imports for two categories: arms and ammunitions; and bomb, grenade, mine and missiles.[8]

The following are selected past examples of Saudi Arabian deals with foreign companies that aim for some element of knowledge transfer. These examples do not include 2018 deals under new efforts from SAMI and GAMI.

- In 2014, Saudi Arabia signed a 14-year contract with Canadian subsidiary of U.S. defense provider General Dynamics Land Systems to build and supply 1000 light-armored vehicles (along with associated equipment and support).
- (Non-U.S. foreign JV 2016): South African/German defense manufacturer Rheinmetall Denel Munition partnered with MIC, opening weapons factory in Saudi specializing in production of artillery shells.
- Saudi Aerospace Engineering Industries (SAEI) is building a $1 billion aircraft maintenance, repair and overhaul facility in Jeddah – led by TAV, will be the largest facility of this kind in the Middle East (11 aircraft hangars, 28 aircraft component shops) focused on civil aviation and military work.
- Saudi Arabia has embarked on a military relationship with Russia to transfer technology and localize the manufacturing and sustainment of armament systems in the Kingdom. In 2017, the Kingdom ordered Russian-made S-400 missile systems, Kornet-EM systems, TOS-1A, AGS-30 and Kalashnikov AK-103.
- In April 2016, the Kingdom signed a $3 billion deal for the purchase of 30 Hawk jets from the UK defense firm BAE Systems.
- In January 2016, the U.K. Ministry of Defense reported that Saudi Arabia had prepared Panavia Tornado IDS strike aircraft with the capability to carry MBDA Brimstone air-to-surface missiles.
- SELEX Galileo, a subsidiary of SELEX ES and part of Italy's Finmeccanica group, established a permanent base in Saudi Arabia in 2010. The company has worked with large programs like Salam and Al Yamamah. It has provided support for Typhoon and Tornado aircrafts in Kingdom. In 2016, the Royal Saudi Air Force ordered six air-traffic control systems from Finmeccanica.

FIGURE 18: Saudi Arabian Defense Import Forecast 2015-2027



Source: USSABC, BMI Research, UN Comtrade

8 Values for 2015-2017 are estimates. Values for 2018-2027 are based on forecast data from BMI Research.

- A joint venture between Boeing and Saudia Aerospace Engineering Industries (SAEI) formed the Saudi Rotorcraft Support Company (SRSC) with facilities in Jeddah and Riyadh equipped to maintain and overhaul the Kingdom's rotorcraft fleet.

For the Saudi Government's procurement of aircraft parts, contractors must subcontract a 30 percent minimum of the contract's value to a Saudi majority-owned firms and must establish training program for Saudi Nationals. Especially given the Saudi Government's stated goals towards localization, firms that have a joint venture with a Saudi company are likely to be favored.

Many of the U.S. defense and aerospace companies engaged in Saudi Arabia's defense and aviation industries are among the highest revenue-generating companies in the sector such as Boeing, Lockheed Martin, General Dynamics, and Northrop Grumman. (See appendix for list of defense and aerospace companies listed by revenues and growth rates)

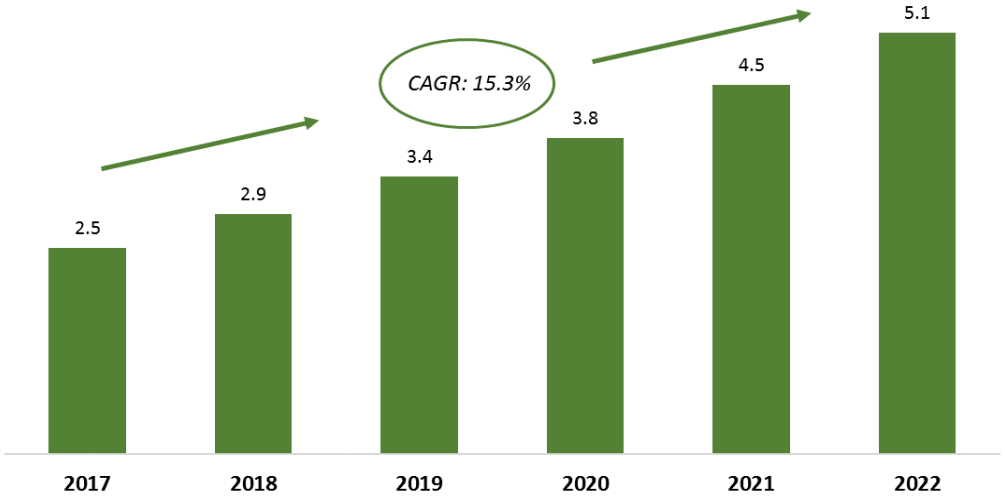
TAQNIA's Partnerships With the Private Sector

The Saudi Technology Development and Investment Company (TAQNIA) has been a key player to securing defense sector knowledge transfer engagements for Saudi Arabia. TAQNIA formed in 2011 under a royal decree as an arm of the PIF. In 2016 TAQNIA Defense and Security Technologies and the Turkish military electronics company ASELSAN entered into a joint venture of equal share, forming the Saudi Arabian Defense Electronics Company (SADEC). SADEC will construct a factory in the Kingdom to manufacture electronic military equipment, radar systems, and electro-optical equipment. Ultimately, this venture is in fulfillment of Saudi Arabia's promise to create high-skilled jobs for Saudis, creating opportunities for Saudi engineers to gain training in Turkish electronic factories. SADEC is an example of Saudi Arabia's shifting preference to become self-sufficient in production of its military equipment.

Cybersecurity, Surveillance, and IT Protection

Saudi Arabia has become a primary target of malicious cyber threats in the Middle East and is expected to have the largest cybersecurity market share in the near future. Vision 2030 calls for a greater '*knowledge economy*' – this growth is highly digital, driven by innovation in big data, cloud services, and smart technology. Given the high levels of risk, cybersecurity will remain a priority for the defense establishment and businesses over the medium to long-term horizon.

FIGURE 19: Saudi Arabian Cyber Security Market Forecast, 2017-2022 (USD billions)



Source: USSABC, 6Wresearch

FIGURE 20 Saudi Arabian Security Market Segment Key Activities

Homeland Security	Commercial Security
• Police Equipment • Electronics • Surveillance • Airport Security • Forensic Sciences • Armour and Apparel • Optical Equipment • Detection • Bomb and Mine Clearance • Air, Marine, Land Mobility • Training and Consulting	• Monitoring Systems • Network and Digital Surveillance • Reconnaissance Services • Guarding Services • Transmission • Electronics Access • Physical Entrance Control • Detection and Alarms • Building Automation • Authentication Systems
Information Security	**Physical Security**
• Internet Security • Data Security • Hardware Security • Physical Access Control • Mobile Security • Software Protection • Back-up and Recovery Systems • Digital Signature	• Physical Entrance Control • Mechanical Security Systems • Mechanical Devices • Perimeter Security

Source: USSABC, Intersec Saudi Arabia

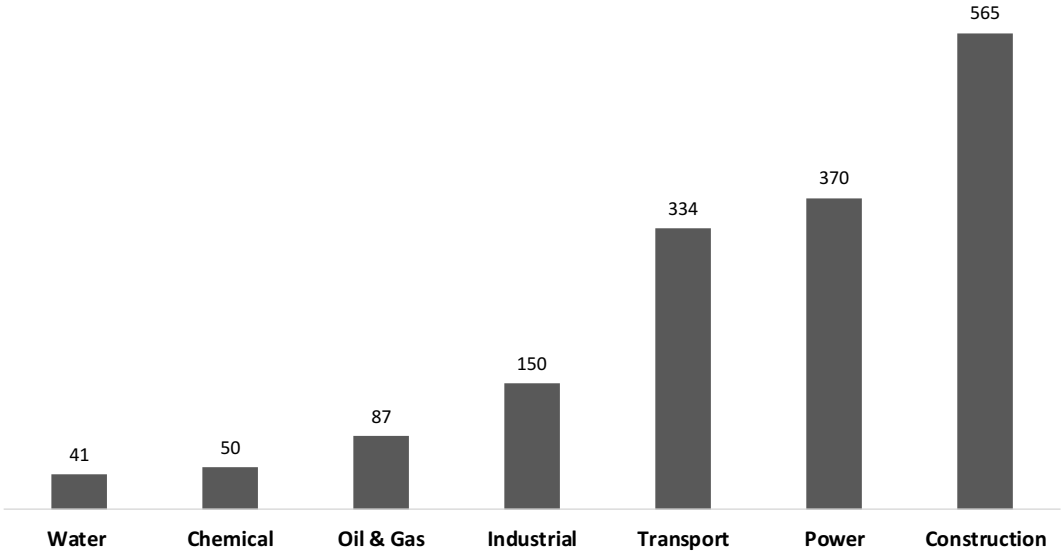
Market demand for electronic security – including access control, intruder detection, and surveillance – is also increasing because of expanding security concerns with infrastructure related areas such as construction, transportation, industrial plants, and oil and gas. We project that the overall cybersecurity market will grow at a 15.3 percent CAGR through 2022.

Security solutions span the public and private sector, encompassing the market segments of homeland security, commercial security, information security, and physical access and perimeter security.

Between 2014 and 2017, nearly one-third of all project-related investment in surveillance in the GCC was made in Saudi Arabia. The top areas for capital investment projects in surveillance were in the construction, power, and transport sectors. Industrials, oil & gas, petrochemicals, and water were also popular sectors for surveillance-related capital investments. The Saudi Government has invested heavily in security command and control, installing approximately 6,000 digital cameras for the 2017 Hajj pilgrimage.

The Saudi Government is also planning to enhance its capabilities to secure the country's borders. According to Homeland Security Research, Saudi Arabia's security spending is expected to increasingly focus on securing its borders and oil industry. Total cyber security spending is expected to rise to $15.4 billion in 2018, up from approximately $8 billion.

FIGURE 21: Saudi Arabian Surveillance Capital Investment Projects by Sector, 2014-2017



Source: USSABC, MEED Insight Research
Notes: Project figures are estimations.

The Saudi Government continues work on major security projects under the King Abdullah Project for Development of Security Headquarters. This project, which is expected to be completed in 2020, will establish a total of 1,296 security sites. Approximately 551 sites are expected to be completed by the end of 2018.

The Saudi Government established the national Computer Emergency Response Team (CERT) to raise public awareness of cybersecurity, to monitor major threats, and to respond to emergencies. New laws have also been issued regarding cybercrime, and the military has taken the initiative to begin bolstering its cyber infrastructure. In Q4 2017, Saudi Arabia established the National Authority for Cyber Security to increase national security that will be under the King's authority.

Opportunities exist for both the private sector and human capital development in this space. In particular, the Middle East ranks in the bottom half for cyber education and training. According to a report by Symantec and Deloitte, over two-thirds of organizations in the Middle East lack the internal capability to defend against sophisticated cyberattacks.

Saudi Arabian Naval Systems

In 2015, the Royal Saudi Naval Forces (RSNF) began its first expansion phase, with plans to replace most of its Eastern Fleet. Much of the Kingdom's American-made fleet entered service in the 1980's, and needed vital upgrades. The SNEP II (Saudi Naval Expansion Program) is intended to modernize the Eastern Fleet. The Saudi Arabian Western Fleet is primarily French made.

In late 2015, RSNF signed an agreement with Lockheed Martin for four heavily-armed littoral combat ships (LCS). The $11 billion agreement including weaponry and systems support. In 2017, Lockheed Martin was awarded a contract under SNEP II for frigates at an estimated cost of $6 billion. The frigate weighs nearly 4,000 tons and can accommodate a crew of up to 130. It is powered by two Rolls Royce MT-30 gas turbines and two Colt-Pielstick diesel engines. The frigate can accommodate 'torpedoes, eight RGM-84 Harpoon Block II anti-ship missiles (ASM), anti-submarine warfare (ASW) sonar suites.'

The new additions to the Saudi fleet are designed with 'eight-cell Mk-41 vertical launch system and a 4D air search radar.' 532 Raytheon RIM-162 Evolved SeaSparrow Missiles (ESSM) – loaded four to a Mk 41 cell – are included in the package.

In May 2017, the Kingdom secured a $28 billion contract with Lockheed Martin for integrated air and missile defense systems, combat ship, tactical aircraft and rotary wing technologies and programs. A 2017 agreement also included provision of training and spare parts for the expansion program. A Memorandum of Understanding signed by SAMI and Lockheed Martin indicated that the company would partner with the Kingdom to expand Saudi defense capabilities in support of Vision 2030. Reportedly, the MoU also indicated localization efforts associated with new additions to the fleet.

Saudi Arabian Aeronautics

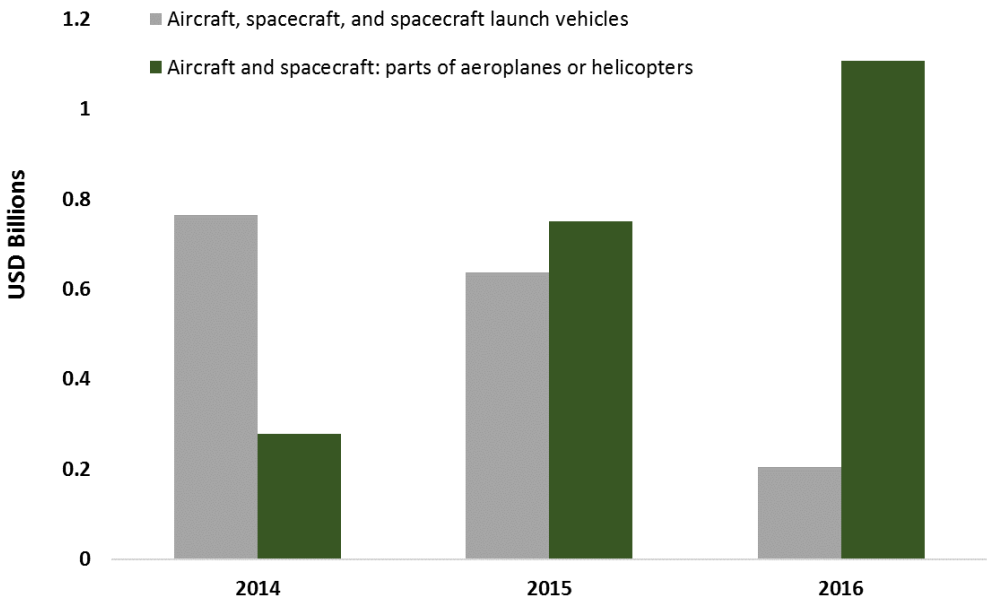
Saudi Arabia has the largest market for aircraft parts in the Middle East. Additionally, Saudi Arabia's fleet of U.S. manufactured military aircraft requires parts for routine maintenance and repair activity, providing a steady stream of demand for parts.

Exports of U.S. aerospace materials to Saudi Arabia averaged $1.8 billion annually between 2010 and 2015. Of these exports, 99 percent were aerospace parts.[9]

Aeronautics exporting to Saudi Arabia has shifted from fully made aircrafts and vehicles to exporting of parts that are fully assembled in Kingdom. Between 2014 and 2016, exports of aircrafts, spacecrafts and launch vehicles declined from over $764 million in 2014 to about $204 million in 2016. Meanwhile, exporting of aircraft and spacecraft parts has steadily increased during this period from $278 million in 2014 to nearly $1.12 billion in 2016.

The United States also exports other technical instruments and appliances for aeronautical or space navigation such as optical devices. In 2016, there were approximately 850 of these devices exported to Saudi Arabia totaling $1.7 million.

FIGURE 22: U.S. Aerospace Exports to Saudi Arabia, 2014-2016



Source: USSABC, UN Comtrade Database

9 U.S. Census Bureau Trade Statistics

United States

Budgetary Spending

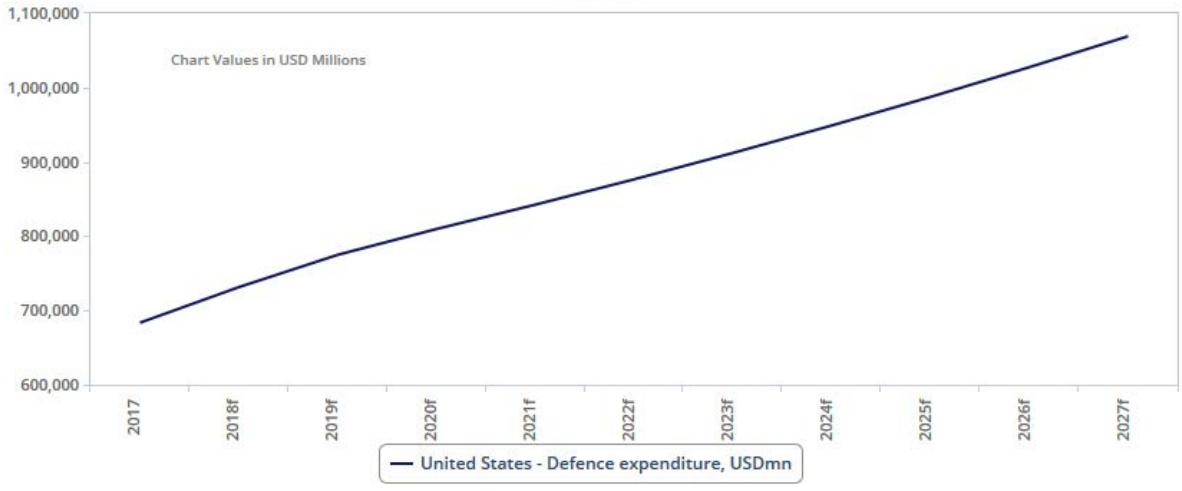
U.S. defense spending remains a significant contributor to the nation's economy, totaling approximately $600 billion per annum. In 2017, U.S. military expenditure totaled $610 billion, approximately 3.1 percent of GDP. This is 2.7 times greater than the second largest spender, China. The United States is the largest military spender in the world, accounting for a 40 percent share of all global military spending in recent years. The United States' spending on military declined each year between 2010 and 2016, though remained steady from 2016 to 2017. At constant 2016 dollars, military spending declined by $95 billion or 14 percent between 2008 and 2017.

Not including foreign arms sales, defense procurement has accounted for approximately 5 percent of U.S. manufacturing output in recent years, while defense-centered research and development has been estimated at 10-20 percent of all national research and development.[10]

To support the modernization of weapons and to expand and upgrade military personnel, the 2018 U.S. defense budget was significantly larger than the previous year, registering at $700 billion.

As shown in the U.S. defense expenditure forecast chart, BMI research data forecasts an upward trajectory of spending over the next decade, with expenditure exceeding $1 trillion by 2027. The chart displaying expenditure breakdown during the period 2017-2027 reveals that the largest categories for defense spending are 'other' and 'personnel' followed by equipment. The category 'other' is expected to increase in share over the next decade, perhaps as the U.S. government undertakes special initiatives to secure its borders and aid its allies.

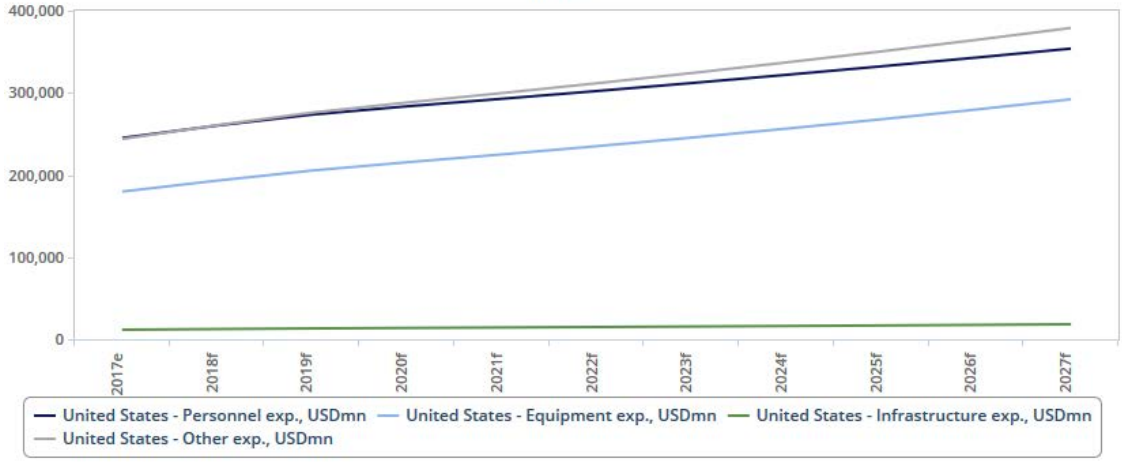
FIGURE 23: U.S. Defense Expenditure Forecast, 2017-2027



Source: USSABC, BMI Research, NATO

10 The Brookings Institution.

FIGURE 24: U.S. Defense Expenditure Forecast - Spending Breakdown, 2017-2027



Source: USSABC, BMI Research, NATO

Macroeconomic Trends

Demand for U.S.-made technology and services exports varies largely from country to country. U.S. defense exports are also highly dependent on the American security relationships with specific countries. Countries including Saudi Arabia and South Korea are consistently key customers of U.S. defense products.

The current political landscape of the U.S. suggests that the country's defense industry sector's output will expand. President Trump's administration and supporters in Congress have stated plans to increase U.S. Armed Forces manpower, and President Trump has commented on a desire to increase ships in the U.S. Navy from 275 to over 350. These goals may not take shape in the short-term as they require legislative and budgetary support.

We expect U.S. policymakers to remain focused on asserting U.S. global military dominance however the international competitive landscape changes amongst competing countries. The U.S. defense sector has a strong outlook supported by increased defense spending domestically and the country's position as the largest defense exporter globally.

BMI Risk/Reward Index

In 2017, BMI Research gave the United States a rewards rating of **73.1** and a risks rating of **77.6**. The risk/rewards index for 2017 was **74.9**.[11] In terms of the Defense Risk/Reward Index for developed states, the United States ranks first, followed by France and the United Kingdom.

The rewards rating for the U.S. evaluates the sector's size and growth potential in each state, along with broader industry/state characteristics that may inhibit its development. The rewards index for defense takes into account both industry-specific and wider country-specific rewards, including elements such as defense exports, interstate-security, macroeconomic conditions and international relations. The U.S. has an exceptional defense-manufacturing base, and as a result, is the largest defense exporter globally. However, in the near term, it may see some competition in procuring new contracts. The U.S. benefits from operation ease within its borders, high military manpower, and has an exceptional number of international defense agreements

The risk rating for the U.S. evaluates industry-specific dangers and those emanating from the country's political and economic profile that call into question the likelihood of anticipated returns being realized over the forecast period. The U.S. is expected to remain the world's largest defense spender and faces low risks of corruption and low risks to security.

The defense Risk/Reward Index evaluates the challenges to operating within a country. It uses data from a multitude of defense, macroeconomic and political sources to generate scores to assess defense industry performance in the U.S.

Defense Related U.S. Job Creation

As of 2016, U.S. Aerospace product and parts manufacturing employed a total of 489,000 workers across all professions.[12] Highly skilled labor – such as architecture and engineering occupations are projected to increase through 2026, with employment in these areas rising by over 4 percent.

11 Metrics are constructed on a scale such that 0=worst, 100=best.

12 U.S. Bureau of Labor Statistics – *Industry-occupation matrix data, by industry.*

Proposed defense contracts and the resulting U.S. Federal Military Spending from deals at a level of $110 billion would have the potential to create approximately 782,000 U.S. jobs by 2025, as our simulation suggests, with top job creation in California, Texas, Florida, Virginia, and North Carolina.

FIGURE 25: Potential Job Creation from $110 Billion in FMS by Top U.S. States

State	2020	2025	2030
California	124,903	81,644	70,538
Texas	131,532	76,719	61,674
Florida	65,221	44,559	39,433
Virginia	65,252	47,757	41,974
North Carolina	65,736	46,868	40,768
Georgia	52,230	36,952	32,026
Washington	44,092	31,335	27,229
New York	36,703	22,873	19,923
Colorado	34,414	22,907	19,277
Illinois	29,739	18,037	15,346
Pennsylvania	28,193	16,994	14,435
Hawaii	28,931	22,115	19,408
Maryland	28,274	19,984	17,510
Ohio	27,021	16,393	13,502
South Carolina	25,617	18,334	15,899
Louisiana	23,754	14,923	12,197
Arizona	20,566	13,553	11,594
Missouri	21,243	14,156	12,197
Kentucky	20,578	14,675	12,623
Tennessee	19,515	11,857	9,931

Source: USSABC, REMI Simulation Data, 2018
Notes: The projected job creation numbers were obtained through an impact simulation at the level of a $110 billion infusion of federal military spending. The simulation assumes the current distribution of defense spending across states. Model input-output supply chain linkages are specific to federal defense purchases.

Foreign Trade

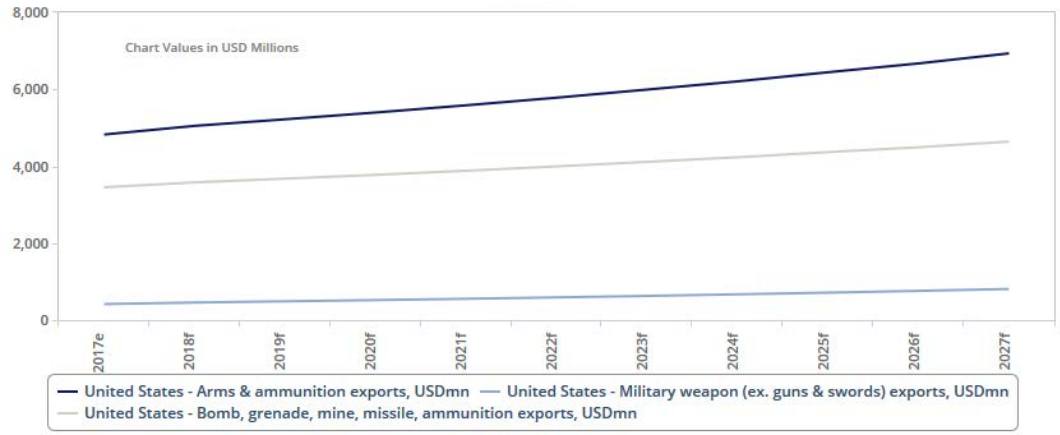
The Unites States participates in cooperative relationships including treaties, international partnerships, and defense agreements globally. In 1949, the United States became part of the North Atlantic Treaty Organization. In 2017, collective military spending by all NATO members totaled $900 billion. (See appendix for U.S. bilateral defense agreements).

The United States is the world's largest defense exporter. The greatest export opportunities for U.S. companies remain with U.S. strategic allies and countries where the U.S. collaborates on security issues. In 2016, U.S. defense exports totaled a free alongside (FAS) value of over $21.6 billion, an increase of just over $1 billion from total 2014 defense exports.[13] The top five export markets were South Korea, Saudi Arabia, Australia, Japan, and the U.A.E. The FAS value of these export markets totaled over $9.3 billion, approximately 43 percent of the defense export market. On an annual basis, Taiwan and the U.K. consistently fall among the U.S. top five-ten export markets. Israel and Mexico consistently rank within the top ten in value terms. Saudi Arabia has become one of the largest defense markets globally for U.S. exporters.

The U.S. defense export forecast chart (not including aerospace) shows breakdowns by export type from 2017 to 2027. Aircrafts made up over 45 percent of U.S. defense exports as of 2016. After aircrafts, the largest defense export categories are arms and ammunitions, followed by bombs, grenades, mines and missiles.

We expect the U.S. to remain the largest global exporter given its advanced domestic capabilities, strong defense alliances internationally, and efforts by U.S. defense firms

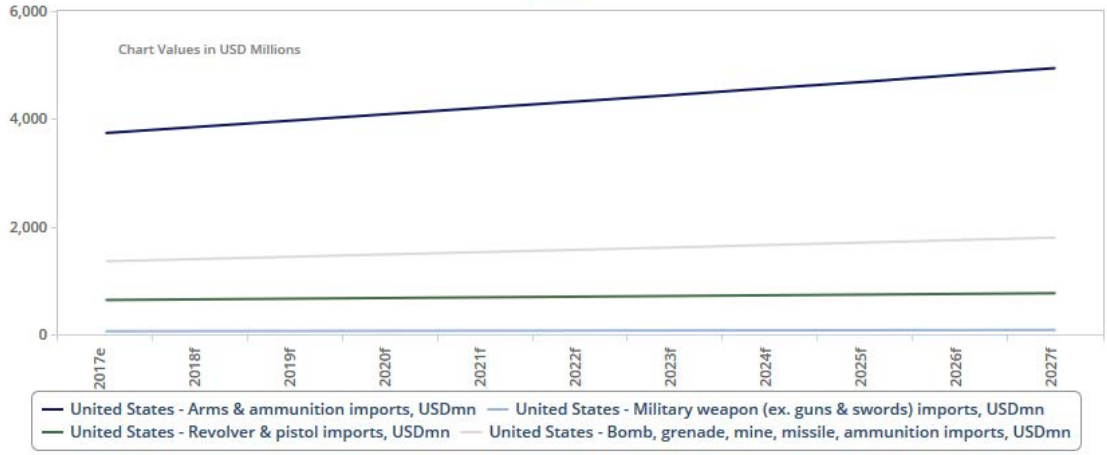
FIGURE 26: U.S. Defense Export Forecast by Export Type, 2017-2027



Source: USSABC, BMI Research, UN Comtrade

13 U.S. Bureau of Census

FIGURE 27: U.S. Defense Import Forecast by Import Type, 2017-2027



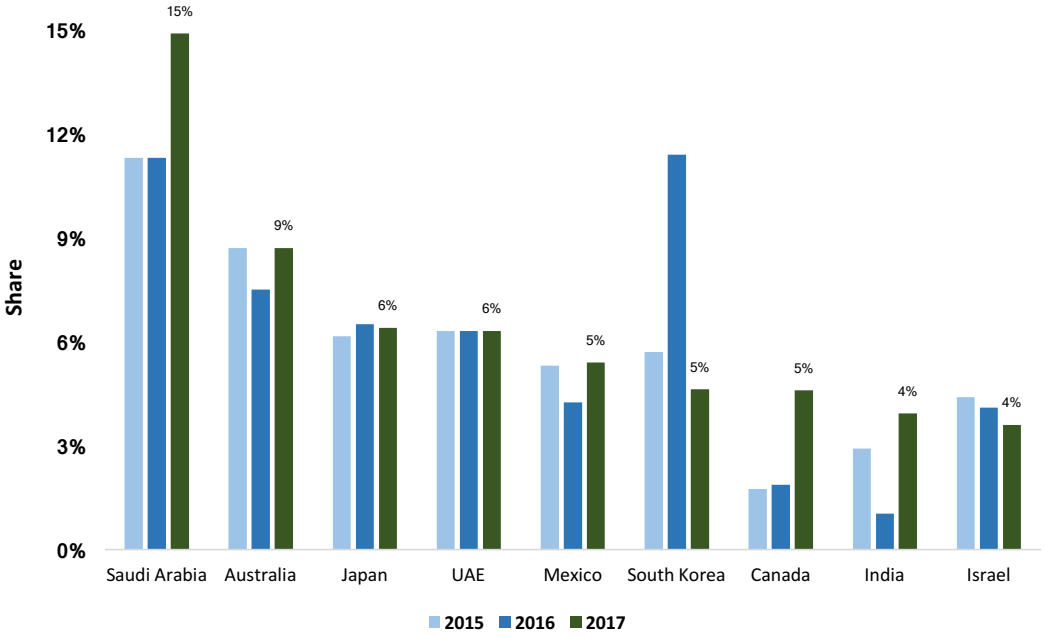
Source: USSABC, BMI Research, UN Comtrade

to secure foreign sales. However, the U.S. is at risk of losing some share in the international defense market in coming years as China and Russia emerge as competitors in segments such as aerospace and cybersecurity.

With increased globalization of the defense industry, the U.S. has seen a rise in its defense imports. The U.S. has a trade deficit with a limited number of European countries such as Germany, Sweden, Switzerland, the Czech Republic and the Netherlands. The United States' largest share of imports are from Germany and the United Kingdom, each accounting for just over 16 percent of the U.S.'s defense imports. However, by aligning with its industrial and security policies, the U.S. government plans to continue meeting most of its defense needs through local procurement.

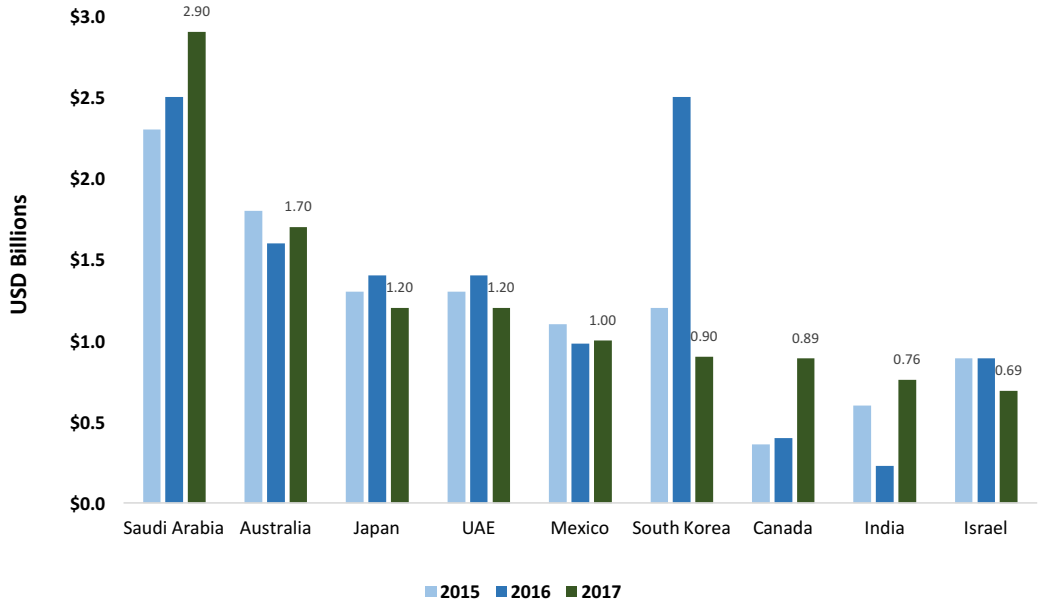
Saudi Arabia was the top U.S. defense export destination in 2017 and the second largest export destination in 2016,

FIGURE 28: U.S. Defense Exports, Share by Destination



Source: USSABC, U.S. International Trade Administration

FIGURE 29: U.S. Military Exports to Top Destinations



Source: USSABC, U.S. International Trade Administration

accounting for 14.9 and 11.3 percent total share both years, respectively. Exports to Saudi Arabia have increased steadily year-on-year. South Korea, U.A.E, Australia, and Japan have also been the top destination for U.S. defense products in recent years.

Growth in defense spending among U.S. allies across the Gulf, Asia-Pacific, and Eastern Europe – on account of economic expansion and regional tensions – is a driving factor behind growth in the United States' defense exports. In addition, budget limitation over the past five years have hindered some research and development as well as procurement efforts of U.S. firms, causing them to focus on external markets. We expect exports to rise primarily in the aircraft and missile segments.

The United States Bureau of Industry and Security (BIS) is responsible for the review of thousands of export license applications each year pertaining to items marked for dual military use or military items that are less sensitive. BIS activities including promotion of public-private partnerships, work on issues surrounding trade and export control as well as monitoring the viability of the U.S. defense industrial base.

Among the export control activities under the BIS's responsibility are technology exports that involve transferring the development or manufacturing of a technology from the United States to another country. Items found on the Commerce Control List (CCL) require an export license, and any such technologies are classified with an Export Control Classification Number (ECCN). The following shows the top export-controlled products to Saudi Arabia.

FIGURE 30: BIS Approved Licenses to Saudi Arabia by Export Control Classification, 2015

Technology Description	ECCN Code	Approved Cases
Military Aircrafts and Related Commodities	9A610	77
Chemical Manufacturing Facilities and Equipment	2B350	66
Military Electronics	3A611	21
Ground Vehicles and Related Commodities	0A606	16
Systems, Equipment, and Integrated Circuits for Information Security	5A002	13
Protective and Detection Equipment	1A004	12
Military Gas Turbine Engines and Related Commodities	9A619	11
Technology Required for the Development, Production, Operation, Installation, and Maintenance of Military Aircrafts	9E610	8
Armored and Protective Equipment, Construction and Components	1A613	7
Software for Information Security	5D002	6
Other Military Categories Total	Multiple	84
	Total	***321***

Source: USSABC, Office of Technology and Evaluation – Bureau of Industry and Security

U.S. exports to Saudi Arabia requiring a BIS license in 2015, the most recent year of available data, accounted for approximately 0.6 percent of the $19.7 billion in U.S. exports. The top export by ECCN to Saudi Arabia in terms of approved licenses was 'military aircrafts and related commodities' with 77 approved cases followed by 'chemical manufacturing facilities and equipment' with 66 approved cases. For these approved licenses, the licensed export shipment counts were 1,231 and 231, respectively.

FIGURE 31: BIS Top ECCN Exports by License Value

Source: USSABC, AES 2016

By licensed value, the top ECCN exports to Saudi Arabia were 'military aircraft and related commodities' followed by 'information security systems equipment and components' and 'military gas turbine engines and related commodities.' Based on this data, strong market opportunities exist for aerospace and information security exporters.

Offset Arrangements

As a requirement or incentive for military-related acquisitions, foreign governments receive commercial and industrial benefits known as offsets – a mandatory form of compensation related directly to either the military purchase or other goods and services. Examples of possible benefits are technology transfer, subcontracts, and licensed or co-production. With international competition for contracts in some of the largest defense markets such as Saudi Arabia, the importance of providing offsets may be increasing.

Defense trade offsets include an array of foreign-government required industrial compensation arrangements. Purchase of defense products and services are conditional on these agreements. The most recent data from the Bureau of Industry and Security (BIS) indicates that American defense contractors reported 38 new offset agreement in 2015 as well as 651 offset transactions that fulfilled previous agreements. The new agreements conducted with 15 countries totaled $3.1 billion while the transactions with 26 countries totaled $5.0 billion.[14]

Aerospace, Defense, and Security Exports

The United States is the largest global exporter of commercial and defense products.[15] Among U.S. manufacturing sectors, aerospace and defense manufacturing generates the largest trade surplus, with a positive balance of $90.3 billion as of 2016. Figures from the Aerospace Industries Association (AIA) noted that international sales from U.S. aerospace and defense set new records for the past five years, reaching $146 billion of sales in 2016. Sales to the Middle East accounted for the largest sales growth, increasing by 22.3 percent. Overall, the aerospace and defense sector comprised 9.5 percent of total U.S. exports.

Of the aerospace and defense exports from the U.S., civil aerospace accounted for 85 percent while defense accounted for the remaining 15 percent. In 2016, exports of civil aerospace products – including engines, aircrafts, and parts – reached $123.7 billion, increasing by 1.6 percent y-o-y. By U.S. export data end-use categories, the top export in terms of value has been military aircraft parts.[16]

FIGURE 32: Top U.S. Military Product Exports

Source: USSABC

14 BIS – *Offsets in Defense Trade Report,* December 2016.

15 SIPRI, UN Comtrade

16 U.S. Department of Commerce, International Trade Administration.

U.S. Defense Companies

Defense firms in the United States are among the largest in the world. They include Boeing, General Dynamics, L-3 Communications, Lockheed Martin, Northrop Grumman, Raytheon, and United Technologies. These companies are regularly awarded contracts from U.S. defense agencies and engaged in U.S. Government programs to maintain the sector's status domestically and to continue creating first-rate technologies. (See appendix for U.S. domestic development programs).

BOEING

Globally, Boeing is the largest manufacturer of commercial aircraft, jetliners, and military aircrafts. The company's military aircraft technologies include advanced systems for surveillance and reconnaissance, airborne antisubmarine warfare and intelligence, global strike systems, and guided missiles. Its missile defense products include the Ground-Based Midcourse Defense system. As a top U.S. exporter, the company supports airlines as well as U.S. and allied government customers in 150 countries.

GENERAL DYNAMICS

Headquartered in Virginia, General Dynamics operates across four main business units: aerospace, combat systems, information systems and technology, and marine systems.

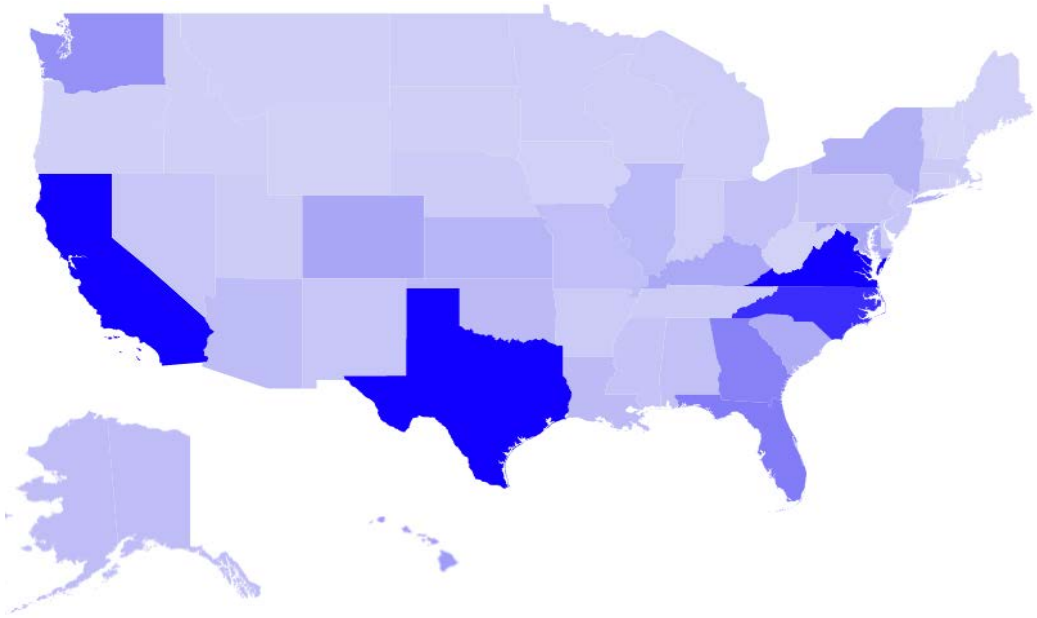
LOCKHEED MARTIN

With its headquarters in Maryland, Lockheed Martin is the world's largest security and aerospace company. The firm is the world's largest military aircraft manufacturer and leads in the providing of air platforms. Along with complete platform development, the firm has exceptional expertise in the subsystem domain and in the civilian aerospace sector. In addition, Lockheed Martin is a leading service provider across the land and sea segments.

NORTHROP GRUMMAN

One of the world's largest aerospace companies, Northrop Grumman's products span complete platforms to major subsystems. The firm has worked to advance its expertise in the field of land systems and has also expanded its civilian business line in recent years.

FIGURE 33: U.S. Defense Spending State Distribution, 2017



Source: USSABC, REMI
Notes: Darker blue indicates greater defense spending.

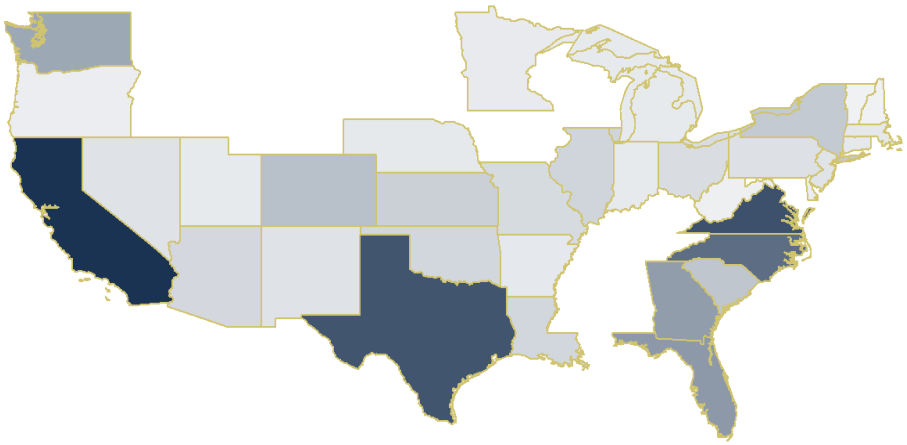
Distribution of U.S. Defense Spending, 2017

Given the locations of major U.S. defense firms, the largest amounts of Federal Military Spending currently are allocated to California, Virginia, Texas, North Carolina, Florida, and Washington.

While nationally FMS accounted for 3.1 percent of U.S. GDP in 2017, FMS perhaps has a more apparent impact on the nation's regional and state economies.

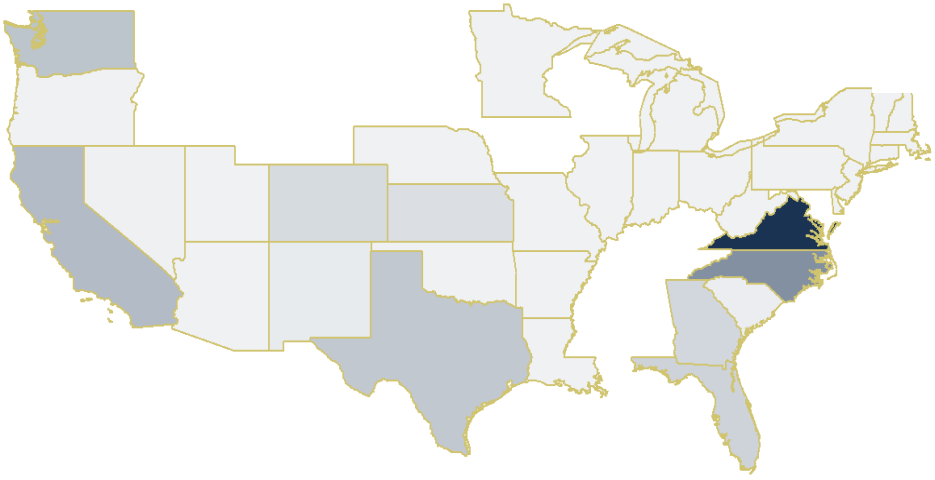
For instance, Virginia is the state that is most defense-dependent, with defense spending accounting for approximately 13 percent of state output.

FIGURE 34: Federal Military Output State Distribution, 2018



Source: USSABC, Regional Economic Models, Inc.

FIGURE 35: Military Exports Distribution, 2018



Source: USSABC, Regional Economic Models, Inc.

In states like California and Hawaii, defense spending has accounted for as much as 11 percent of state output in recent years. In states including Maryland, and Washington D.C., defense-related spending accounts for nearly 6 percent of output.

Defense Contracts

At the end of 2017, the U.S. Army awarded a contract to BAE Systems allowing for full-rate production of M109A7 self-propelled howitzer and M992A3 ammunition carrier vehicles. All aspects of the award, including all vehicle options, have brought the value to an estimated $1.7 billion.

In early 2018, the Connecticut-based helicopter manufacturer Sikorsky, a subsidiary of Lockheed Martin, was awarded a $194 million contract by the U.S. Army for 17 UH-60M Black Hawk helicopters to be supplied to Saudi Arabia, with expected completion by December 2022. Of these helicopters, 8 will be for the Saudi Arabian National Guard and 9 will be for the Royal Saudi Land Forces Airborne Special Security Forces.

Under its current contract and the U.S. Foreign Military Sales program, Sikorsky supplies the Saudi Ministry of Defense with Seahawk helicopters.

By way of 'pilot authorities' – established under the 2017 National Defense Authorization Act – the United States Pentagon has expedited the process of weapons delivery for contracts with foreign allies including Saudi Arabia, South Korea, and Japan. Reportedly, pilot authorities change the design and execution of contracts, allowing U.S. officials to write domestic weapons contracts that reduce delivery time.

The pilot authorities aim to ease the process for foreign countries looking to do business with U.S. defense companies – speeding up the deal approval process to help the U.S. win new contracts. For instance, foreign officials have bought Chinese or Russian alternative products while acknowledge they are purchasing a lesser technology because it can be acquired quickly. Thus, these changes to processes will help U.S. officials to succeed with these types of opportunities.

Market Opportunities and Barriers for U.S. Companies

Among the market segments with the greatest potential opportunities for U.S. companies are military aircrafts and parts; ground combat technologies; intelligence, surveillance and reconnaissance (ISR); and naval platforms. Suppliers of parts used in these supply chains may also benefit from access to new foreign military opportunities. As the U.S. continues to strengthen its ties in the Middle East and the rest of Asia, new opportunities may develop to increase export volumes in these regions.

In comparison to international markets, levels of U.S. investment in research and development are exceptionally high, suggesting that U.S.-led innovation remains a focus area for growth. Additionally, given concerns of increasing competition from other global defense players such as China and Russia, we expect investment levels into defense research and development to grow. There are limited barriers for U.S. defense firms, though some parts of export control legislation may inhibit sales to some countries.

Data Sources

BMI RESEARCH

The online research platform provides country-specific macroeconomic and financial market data.

GENERAL AUTHORITY OF STATISTICS (GASTAT)

In 2016, the Council of Ministers approved the General Authority of Statistics to oversee technical supervision and organization of the Saudi Statistics and Information Sector. GaStat has created and manages a system of national statistical databases through development of the central information center and aims to develop and maintain statistical information in an accurate and unified system.

INTERNATIONAL INSTITUTE FOR STRATEGIC STUDIES (IISS)

The IISS is a world-leading authority on global security, political risk and military conflict.

MEED

MEED provides coverage of business news, data and analysis, tenders and contract awards. MEED Projects provides in-depth project tracking for the Middle East and North Africa.

REGIONAL ECONOMIC MODELS, INC. (REMI)

REMI models have been used globally for a wide range of topic areas including economic development, the environment, energy, transportation, taxation, forecasting, and planning. The model incorporates input-output (IO) tabulation, computable general equilibrium, econometrics, and new economic geography. The REMI model generates forecast data for each the U.S. and Saudi Arabia across a variety of country-specific industry sectors.

STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE (SIPRI)

Established in 1966, SIPRI is an independent international institute dedicated to research into conflict, armaments, arms control and disarmament. The SIPRI Military Expenditure Database contains consistent time series on the military spending of countries for the period 1949-2016.

U.S. BUREAU OF CENSUS

The United States Census Bureau is a principal agency of the U.S. Federal Statistical System, responsible for producing data about the American people and economy. The U.S. Census Bureau is overseen by the Economics and Statistics Administration (ESA) within the Department of Commerce.

Appendix I:

Saudi Arabian Bilateral Defense Agreements

Year of Agreement	Partner Country	Defense Agreement Terms
1951	*United States*	A Mutual Defense Assistance Agreement such that the U.S. may provide military equipment and training for the Saudi armed forces and may establish a U.S. Military Training Mission in Saudi Arabia.
1973, 2005, 2017	*United Kingdom*	A Memorandum of Understanding (MoU) facilitating delivery of arms from the U.K. to the Royal Saudi Air Force. An Understanding Document calling for closer cooperation in modernizing the Saudi Armed forces and allowing for joint training exercises. A Security Cooperation Document promoting cooperation across defense and security supporting Saudi Arabian efforts against counter-terrorism, intelligence, training, and logistics.
2008	*Russia*	Agreement for Military and Technological Cooperation.
2014	*India*	A Memorandum of Understanding (MoU) for Defense Cooperation allowing for the exchange of defense-related information, military training and education, along with cooperation in areas spanning security, logistics, and hydrography.
2014	*Pakistan*	A Defense Cooperation Agreement supporting the joint training of military personnel. Facilitation of joint ventures (JV) in defense production.
2014	*Indonesia*	A Defense Cooperation Agreement covering training, education, counter-terrorism, and defense industry cooperation.
2016	*Japan*	Several Memoranda of Understanding (MoU) to foster defense and military cooperation within the framework of Vision 2030.
2016	*China*	Security Cooperation Agreement including coordination for counterterrorism and joint military drills.
2017	*Germany*	A Memorandum of Understanding (MoU) in security such that Germany will provide training in border protection and will establish courses for Saudi military personnel.
2017	*United Arab Emirates*	A bilateral military partnership separate from the Gulf Cooperation Council (GCC). A Joint Cooperation Committee to coordinate all military, political, economic, trade, and cultural fields.

Source: USSABC, Various

Appendix II:

Structure of Saudi Arabian Military Industries (SAMI)

Source: USSABC, Public Investment Fund

Appendix III:

Other Military Entities and Companies

MILITARY INDUSTRIES CORPORATION (MIC)

The organization is 60 years old and was formed to further Saudi Arabia's defense industry. The goal of its creation was to support national security through the creation of a sophisticated military industry responsible for purchase of arms, ammunition, military equipment. H.R.H King Salman appointed CEO of SABIC Mohammed Al Mady to take over MIC. In practice, MIC only successfully developed the light ammunition industry.

ADVANCED ELECTRONICS COMPANY (AEC)

Created in 1988 under Saudi Arabia's Economic Offset Program (EOP), AEC has developed its services outside of defense. AEC provides expertise in manufacturing, electronics repair, and engineering in sectors including health care, ICT, and energy.

ALSALAM AEROSPACE INDUSTRIES

The company was originally created in 1987 under the Saudi Government's Economic Offset Program to provide maintenance and modification services for civilian and military aircrafts. Following the release of Vision 2030 in 2016, Alsalam has aligned its mission to correspond with a broad base of opportunities in manufacturing, working to expand its services to also include assembly of military aircrafts and F-15 parts manufacturing.

MIDDLE EAST PROPULSION COMPANY (MEPC)

Formed as part of Saudi Arabia's EOP in 1989, MEPC offers maintenance, repair, and overhaul services (MRO) for F-15, Hercules, Tornado, and turboprop engines that are used in aircrafts present in the Royal Saudi Air Force. MEPC's military aircraft engine overhaul facility is located in King Khalid International Airport Industrial Park. MEPC's vision is 'to be the Center of Excellence for Propulsion Systems Services in the Kingdom of Saudi Arabia and the Gulf Region… and to be the preferred MRO provider for the military customers providing quality product.'

INTERNATIONAL SYSTEMS ENGINEERING (ISE)

Established under EOP in 1988, ISE provides IT solutions and services within the defense, aerospace, and national security spaces. ISE reports offerings in cyber security, supply chain management, intelligence, and managed network service.

ABDULLAH AL FARIS COMPANY FOR HEAVY INDUSTRIES

The company covers segments such as military, tactical, logistic support vehicles; metal processing; and ballistic protection.

Appendix IV:

Defense and Aerospace Companies by 2016 Revenue

Ranking	Company	Millions USD
1	Boeing	$94,571
2	Airbus Group	$73,699
3	Lockheed Martin	$47,248
4	General Dynamics	$31,353
5	United Technologies	$28,925
6	GE Aviation	$26,261
7	Northrop Grumman	$24,508
8	BAE Systems	$24,129
9	Raytheon	$24,069
10	Safran	$18,247
11	Thales	$15,037
12	Leonardo	$13,287
13	Rolls-Royce	$12,150
14	Honeywell Aerospace	$11,696
15	L3 Technologies	$10,511
16	Textron	$9,916
17	Bombardier Aerospace	$8,765
18	Mitsubishi Heavy Industries Aerospace	$8,244
19	Harris Corp.	$7,467
20	Huntington Ingalls Industries	$7,068

Source: USSABC, Deloitte Global Analysis

Appendix V:

Defense and Aerospace Companies by 2016 Revenue Growth

Ranking	Company	Percentage
1	Harris Corp.	46.9%
2	Oshkosh Defense	43.8%
3	SKF	43.7%
4	GKN Aerospace	434.0%
5	Hanwha Techwin	34.8%
6	Chemring	26.5%
7	Meggitt	23.8%
8	BBA Aviation	20.5%
9	FACC AG	19.2%
10	JAMCO Corp.	19.0%
11	HEICO Corp.	18.5%
12	Transdigm Group Inc.	17.6%
13	Kaman Aerospace	17.5%
14	Senior Aerospace	15.7%
15	Rheinmetall Defense	13.7%
16	Smiths Detection	12.6%
17	Leidos Holdings, Inc.	12.5%
18	CAE Inc.	11.5%
19	CACI	10.0%
20	Indira Systems	7.7%

Source: USSABC, Deloitte Global Analysis

Appendix VI:

Highlights of United States Bilateral Defense Agreements

Year of Agreement	Partner Country	Defense Agreement Terms
1951	*Saudi Arabia*	A Mutual Defense Assistance Agreement such that the U.S. may provide military equipment and training for the Saudi armed forces and may establish a U.S. Military Training Mission in Saudi Arabia.
1951	*Philippines*	Mutual Defense Treaty.
1956	*Canada*	The Defense Production Sharing Agreement is a bilateral trade agreement to stabilize the quantity of military cross-border purchases. The Defense Development Sharing Program organizes sharing of military research and development.
1958, 2010	*United Kindom*	U.S.-U.K. bilateral treaty on nuclear weapons cooperation. Treaty between the government of the United States and the government of the United Kingdom concerning defense trade cooperation.
1994	*United Arab Emirates*	A Defense Cooperation Agreement allowing the U.S. to base troops and equipment within U.A.E. federation borders. The agreement facilitates cooperation on both training and operational missions.
2005, 2015	*India*	New Framework for India-U.S. Defense Relations for strategic partnership in defense trade, joint exercises, personnel exchanges, and cooperation in maritime security. An agreement for high-level strategic discussions, continued exchanges between armed forces, and strengthening of defense capabilities.
2007	*Australia*	Treaty between the government of the United States and the government of Australia concerning defense trade cooperation.
2010	*Israel*	Memorandum of Understanding (MoU) regarding technical assistance in developing and modernizing Israel's aviation secuirty structure.
2010	*Brazil*	Defense Cooperation Agreement promoting cooperation in research and development, logistics, IT security, and trade of defense products. The agreement supports information exchange, combined military training and education, joint military exercises, naval ship visits, and defense-related commercial initiatives.
2011, 2015	*Vietnam*	A Memorandum of Understanding (MoU) - Advancing Bilateral Defense Cooperation. A Joint Vision Statement on defense relations.
2013	*South Korea*	60th anniversary of U.S.-South Korea alliance. Combined Forces Command coordinating operations between U.S. units and South Korean armed forces.
2015	*Japan*	An update to the U.S.-Japan military relationship agreement which strengthened ties between the two parties regarding, cyber, space, and industrial programs.
2015	*Singapore*	Enhanced Defense Cooperation Agreement upon which both parties will cooperate on military, policy, strategic and technology, and non-traditional security challenges such as terrorism and piracy.
2015, 2017	*Jordan*	Defense Cooperation Act and Defense Cooperation Act Reauthorization in support of military cooperation, joint military exercises, and strategic partnership in fighting terrorism.

Source: USSABC, Various

Appendix VII:

U.S. Domestic Development Programs[17]

(F-35 LIGHTNING II JOINT STRIKE FIGHTER)

A fifth-generation joint strike fighter aircraft program led by Lockheed Martin. In addition to the U.S., the $1.5 trillion program involves nine partner nations (Australia, Canada, Denmark, Italy, the Netherlands, Norway, Turkey, and the UK) with another three foreign military sales customers. The aircraft consists of 300,000 parts from 1,500 international suppliers. Lockheed Martin describes the F-35 Lightning II as 'a fifth-generation fighter, combining advanced stealth with fighter speed and agility, fully fused sensor information, network-enabled operations and advanced sustainment.' The U.S. air force is the single largest customer of the program.

(KC-46A PEGASUS TANKER)

an aerial refueling tanker developed by Boeing. After an initial contract of $2.8 billion was agreed by the U.S. air force in August 2016 for initial low-rate production of 12 aircraft, a second order of $2.1 billion for an additional 15 aircraft was agreed in June 2017.

(COLUMBIA-CLASS SUBMARINE)

a program to replace the U.S. Navy's Ohio-class ballistic missile submarines with a total of 12 submarines, with the first on operational patrols by 2031. Procurement of the first vessel is scheduled for 2021, with advanced procurement funding to be awarded from 2017. General Dynamics (Electric Boat) is the prime contractor on the $100 billion program, which also includes Huntington Ingalls Industries' Newport News Shipbuilding.

(VIRGINIA-CLASS SUBMARINE)

a nuclear-powered multi-mission attack submarine. The submarines are built by General Dynamics (Electric Boat) and Huntington Ingalls Newport News Shipbuilding. The FY2018 budget request included a $5.5 billion investment to procure 2 Virginia-class submarines, although uncertainties over the budget suggest that the timeframe for these procurements may be delayed.

(B-21 BOMBER AIRCRAFT)

a long-range strike bomber being developed by Northrop Grumman under a $1.4 billion contract from the U.S. Air Force. Sub-contractors include U.S.' Pratt & Whitney, U.K.'s BAE Systems.

(P8A POSEIDON AIRCRAFT)

an anti-submarine warfare (ASW) and anti-surface warfare (ASuW) aircraft. The airframe is developed by Boeing and the engines by CMF International (GE Aviation and Sneca). The aircraft is equipped with a Raytheon radar. Other companies involved in the manufacturing are Spirit AeroSystems and Northrop Grumman.

(C-130 AIRLIFTER)

A tactical airlift, aerial refueling, and military special mission aircraft that comes in many versions. The manufacturer is Lockheed Martin.

(AEGIS BMD/SM-3 BALLISTIC MISSILE DEFENSE)

AEGIS BMD is the main component of the sea based element of the U.S. Ballistic Missile Defense System (BMDS). The program is run by the Missile Defense Agency (MDA), and is constructed upon the existent U.S. Navy AEGIS weapons system and Standard Missile infrastructures. Lockheed Martin's radar system is a key component of the AEGIS Combat System. Raytheon provides the RIM-161B SM-3 Block IA and RIM-161C SM-3 Block IB systems for the project.

(AEGIS DESTROYER)

is a multi-mission guided missile destroyer designed to perform ASW, anti-air warfare (AAW), and ASuW missions. The main contractors are Bath Iron Works (General Dynamics) and Huntington Ingalls. Upgrades are to be put into the Arleigh Burke-class destroyers.

(TRIDENT II)

Lockheed Martin provides the UGM-133 Trident II (D5) submarine-launched ballistic missile for this project.

(EELV LAUNCH VEHICLES)

The EELV is a U.S. DoD program, which provides two families of launch vehicles, the Delta IV and Atlas V. The United Launch Alliance (ULA), a Boeing and Lockheed Martin joint venture, is the sole provider of EELV launch services.

(GLOBAL POSITIONING SYSTEM)

a group of orbiting satellites that provides navigation data to military and civilian users globally. The main contractors are: Boeing (GPS IIF), Lockheed Martin (GPS IIIA) and Raytheon (GPS OCX Phase A).

17 BMI Research

(SPACE-BASED INFRARED SYSTEM)

a satellite system providing data for missile surveillance, missile defense, technical intelligence, and battle space awareness. The prime contractor is Lockheed Martin, while Northrop Grumman (subcontractor) is the payload integrator.

(LITTORAL COMBAT SHIP)

a naval platform divided into the Independence and Freedom classes developed by Lockheed Martin, Austal USA and General Dynamics. Designed to 'defeat growing littoral threats and provide access and dominance in the coastal water battlespace', according to Lockheed Martin. Lockheed Martin has seen four Freedom-class Littoral combat ships commissioned into the U.S. Navy; a further four have been launched, while two are presently under construction. Of the Independence-class littoral ships, five were in active service at the time of writing while six were under construction and two were in the pre-production phase.

(STRYKER ARMORED VEHICLE)

an eight-wheel, medium-weight armored vehicle, designed to maneuver in close and urban terrains. The main contractor is General Dynamics Land Systems. Abrams tank: a main battle tank, manufactured by General Dynamics Land Systems. According to the GDLS website, the vehicle has been designed with a strong focus on survivability, in addition to mobility, lethality, adaptability and maintainability.

(JOINT LIGHT TACTICAL VEHICLE (JLTV))

The JLTV, for which Oshkosh received a $30 billion contract in 2015, is to replace the U.S. Army's AM General High Mobility Multipurpose Wheeled Vehicle (HMMWV) currently in service. The vehicle is being developed with a particular focus on high-level ballistic/mine protection and cross-country mobility.

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