

MEDICAL DEVICES

February 2018

Narin Tunpalboon

narin.tunpalboon@krungsri.com

+662 296 2943

- Over the next three years, Krungsri Research is expected that both the domestic and international markets for medical devices will grow at an average rate of 8.5-10.0% per year. This growth will be supported by: (i) government policy, which is focused on promoting investment in the sector through the offering of special investment privileges and the establishment of an official target for Thailand to become a medical hub and a center for the export of medical devices by 2020; (ii) the rising trend of illness in Thais, especially heart disease, stroke, cancer and diabetes due partly to the increasing number of elderly; (iii) the increasing proportion of foreign patients coming for medical treatment in Thai hospitals due to credibility of quality and standard of medical treatment amid upward trend of expatriates and medical tourists; and (iv) plans by existing hospital operators to invest in new hospitals and medical equipment that will support continuous growth momentum in demand for medical devices in Thailand.
- However, the entry of foreign operators into the Thai market may put pressure on existing operators due to higher competition. Meanwhile, most domestic operators that have to import materials also face increasing cost of currency hedging to cope with fluctuating of exchange rates. In this case, cost of imported products would also move in line with changes in new technology and innovations. This could put pressure on operators' profitability.

Overview

The medical device sector includes both medical devices and medical equipment^{1/} and is considered a high-value industry. Despite unfavorable economic conditions, the sector has seen ongoing growth, partly because its products are life essentials for a population that is increasingly aged and which thus requires an increasing supply of medical products.

Medical devices can be divided into three categories according to types of use.

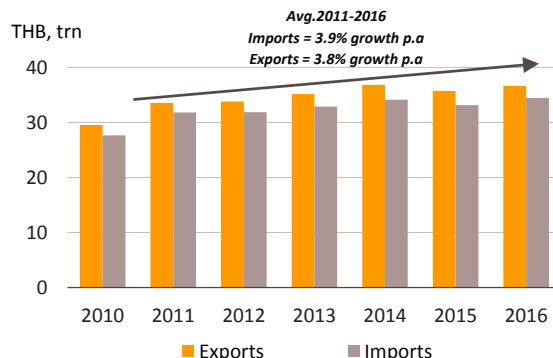
1) Single-use devices are used in general medical treatments and generally do not rely on high-technology. The majority of these items are used once only and are then disposed of. Examples include syringes, hypodermic needles, tubes, catheters, cannulae, disposable gloves and other items used in dentistry or ophthalmology.

2) Durable medical devices are used for durable medical purposes with a life-span of at least one year. Examples include first aid kits, wheelchairs, medical beds, technical equipment used in medicine, surgery and dentistry, electrical diagnostic tools, x-ray machines and so on.

3) Reagents and test kits includes equipment used to diagnose illnesses and conditions and chemical kits used to test samples drawn from patients, for example, to check for blood type, in preparation for dialysis, to test for pregnancy and HIV infection, etc.

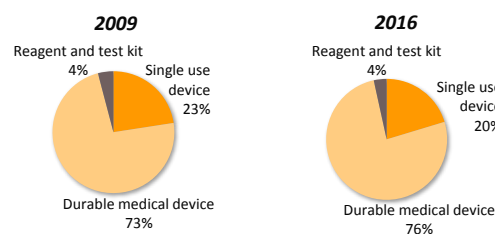
The combined value of the global market for imports and exports of medical devices in 2016 was THB 71.13 trn, with growth in the market averaging 3.8% per year over the period 2011-2016 (Figure 1). By value, durable goods comprised 76% of this total, up from the 73% recorded in 2009 (Figure 2), single-use devices 20%, and reagents and test kits 4%. The most important exporter of medical devices was Germany, which accounted for 18% of all exports globally (Figure 3). This was followed by the United States (11%), Japan (9.5%), and China (7%). As regards imports, the United States was in first place, taking 23% by value of all imports, followed by Germany (8%), China (6.7%), and the United Kingdom (3%). As for Thailand, it sat in 17th place for exports and 32nd place for imports.

Figure 1: Global Sales of Medical Devices



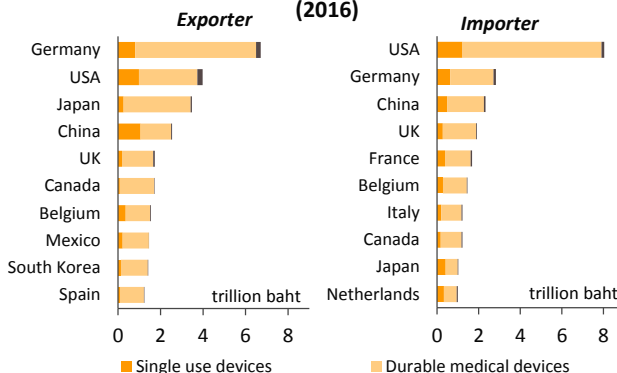
Source: Medical Device Intelligence Unit (MeDIU)

Figure 2: Global Sales of Medical Devices by Type



Source: MeDIU

Figure 3: Importers and Exporters of Medical Devices (2016)



Source: MeDIU

1/ Medical devices include items which are used in the medical, nursing and midwifery professions to provide treatments for bodily conditions such as X-Ray equipment, ultrasound machines, reagent and test kits, and dental devices. Medical equipment refers to surgical and medical equipment e.g. scalpels, thermometers, blood-pressure monitors, and items such as disposable gloves and masks.

In terms of corporations, the largest manufacturers of medical appliances are multinationals (Table 1) and in terms of nations, the United States earns the most income of any country from the distribution of medical equipment and devices. This is because the United States is both a major producer and exporter of these items, and because it has production base scattering around the world. Most of them are high-value products such as electro-diagnostic devices, orthopedic and fracture devices, x-ray equipment, and dentistry devices. Within Europe, important producers include Germany, France and the United Kingdom. Germany in particular is regarded as a source of high-quality goods and an important innovator of new products

In the Asia-Pacific region, Japan is the leading producer of medical devices and has seen continuing growth in exports. With a 9.5% share of the global market, Japan is the world's third most important exporter thanks to its position as the leading high-tech innovator in Asia and the recognition which Japanese products enjoy worldwide. Japan is followed in importance by China (fourth in terms of global exports with a 7.0% market share), though Chinese medical devices, like those produced in the ASEAN zone, tend not to be high-tech products and in fact almost all high-tech medical devices which are consumed on the Chinese and ASEAN markets are imported from producers in countries such as the United States, Germany and Japan.

Thailand's medical device sector currently, operates under the legal provisions of the Act on Medical Devices (2008). The Medical Device Control Division under the Food and Drug Administration acts as the agency responsible for overseeing the sector and for issuing permits to produce, distribute and import medical devices according to the specifications and standards laid out by the Thai Industrial Standards Institute. This was with the goal of assuring consumers that all medical devices on the Thai market meet the same standards and to help build both the competitiveness of the sector and acceptance of Thai products on the domestic and export markets.

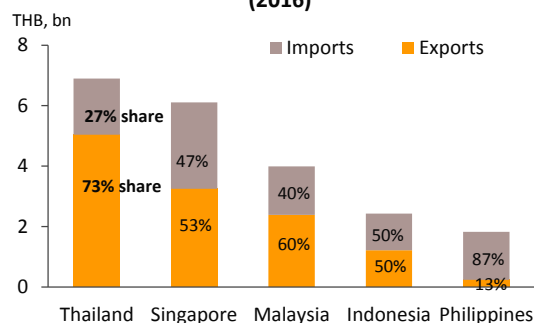
Thailand is the important market in the ASEAN zone, with import and export value split in the ratio of 27:73 (Figure 4). Durable medical devices are the largest group of imports (44% by value of all imports of medical devices to Thailand). Typically, these are high-tech goods such as ultrasound scanners, x-ray machines, electrocardiograms, electroencephalograms, and ophthalmological equipment. The most important source of imports is the United States (22% of all imports of medical devices by value), followed by China, Japan, and Germany. On the other hand, most Thai exports are of single-use devices. These account for 84% of all exports by value and include disposable medical gloves, syringes and hypodermic needles, and dressings. Operators which manufacture for export from Thailand are mostly transnational companies which have invested in production facilities in Thailand to export back to their home countries, including Japan, the United States and France. The most important markets for Thai exports are the United States (29% of all exports by value), and then in descending order of importance Japan, Germany and the Netherlands (Figure 5).

Table 1: Global Top 10 Medical Device Companies

	Company	Country	Revenue 2016 (USD, bn)
1	Medtronic	U.S.	28.8
2	Johnson & Johnson	U.S.	25.1
3	GE Healthcare	U.K.	18.2
4	Fresenius (Medical Care)	U.S.	18.0
5	Philips (Healthcare)	Netherlands	16.0
6	Siemens (Healthineers)	Germany	14.1
7	Becton Dickinson	U.S.	12.5
8	Cardinal Health	U.S.	12.4
9	Stryker	U.S.	10.9
10	Baxter International	U.S.	10.2

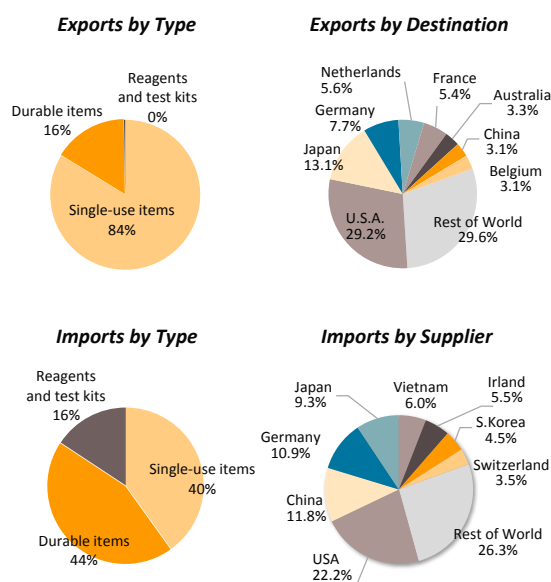
Source: Pharmaceutical & Life Science Recruitment Agency

Figure 4: ASEAN Top 5 Markets for Medical Devices (2016)



Source: MeDIU

Figure 5: Thai Medical Device Trade (2016)



Source: MeDIU

The domestic medical device sector is focused primarily on manufacturing for export markets; roughly 70% of the sector's total sale value comes from exports and only 30% from the domestic market. The sector's primary output is of basic goods which use raw materials and inputs such as rubber and plastic that are available on the domestic market. These goods may be classified according to their use, as follows:

1) Single-use devices: The production that Thailand has high potential in terms of production and competition in the world markets include medical gloves since the production of these relies on non-sophisticated technology and Thailand is also an important world producer of rubber, the major input into the production of disposable gloves. Over 90% of the output of medical gloves is bound for export markets, and operators have enjoyed continuously growing demand. Within the single-use devices group, syringes and hypodermic needles are the second most important product. Manufactures of these benefit from the fact that production uses plastic as the main input, costs are not particularly high, and these are widely used products. Overall, according to a survey by the Plastics Institute of Thailand, the single-use devices represent around 55% of the total domestic medical device producers (Figure 6).

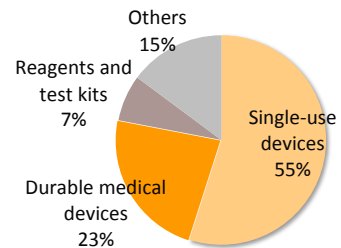
2) Durable medical devices: Within this group of products, items such as hospital beds, examination tables and wheelchairs are the most important for Thai producers and exporters because manufacturing these goods does not require the use of advanced manufacturing technology.

3) Reagents and test kits: The domestic market for these goods is still somewhat small so only 7% of total manufacturers in this industry, most are joint ventures with multinationals that are interested in entering the Thai market. Examples of items produced in Thailand include diagnostic kits to test for diabetes, kidney disease, and hepatitis, although in the last 1-2 years Thai operators have increasingly produced and exported diagnostic kits to test for serious non-communicable conditions found in the elderly.

Excluding those serving the dental market, there are at present 538 registered producers of medical devices in Thailand (Business Online, January 2018). **The vast majority of these** (530 producers, or 98% of the total) **are SMEs** but the 8 large-scale operators, which comprise just 2% of the total, take 60% of the income of the sector (Figure 7). Many of these producers are multinational companies, examples of which include Nipro (Thailand), Hoya Optics (Thailand), and Kawasumi Laboratories (Thailand) (Table 2). Data from the Food and Drug Administration indicates that there are over 2,000 registered importers of medical devices. As shown in Figure 8, distribution channels of manufacturers and importers take the following forms (Figure 8):

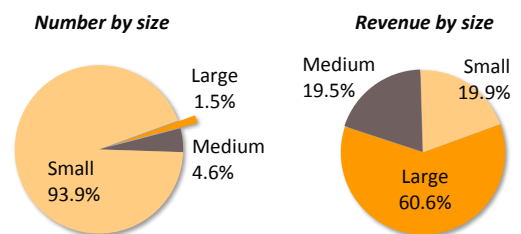
1) Direct distribution to healthcare providers: This type of distribution includes public- and private-sector hospitals and clinics Sales of medical devices to public-sector hospitals is carried out according to government procurement procedures. The Ministry of Finance has changed the old purchasing system, under which purchases up to THB 0.1 m took place under the 'agreed price' procedure, between THB 0.1 m and THB 2 m the 'price checking' mechanism was in effect, and when a purchase was for a value of over THB 2 m, competitive bidding was arranged. This has now been replaced with an e-bidding process. Private-sector hospitals make purchases according to their own procedures.

Figure 6: Thai Medical Device Manufacturers by Type



Source: MeDIU

Figure 7: Thai Medical Device Manufacturers (2016)



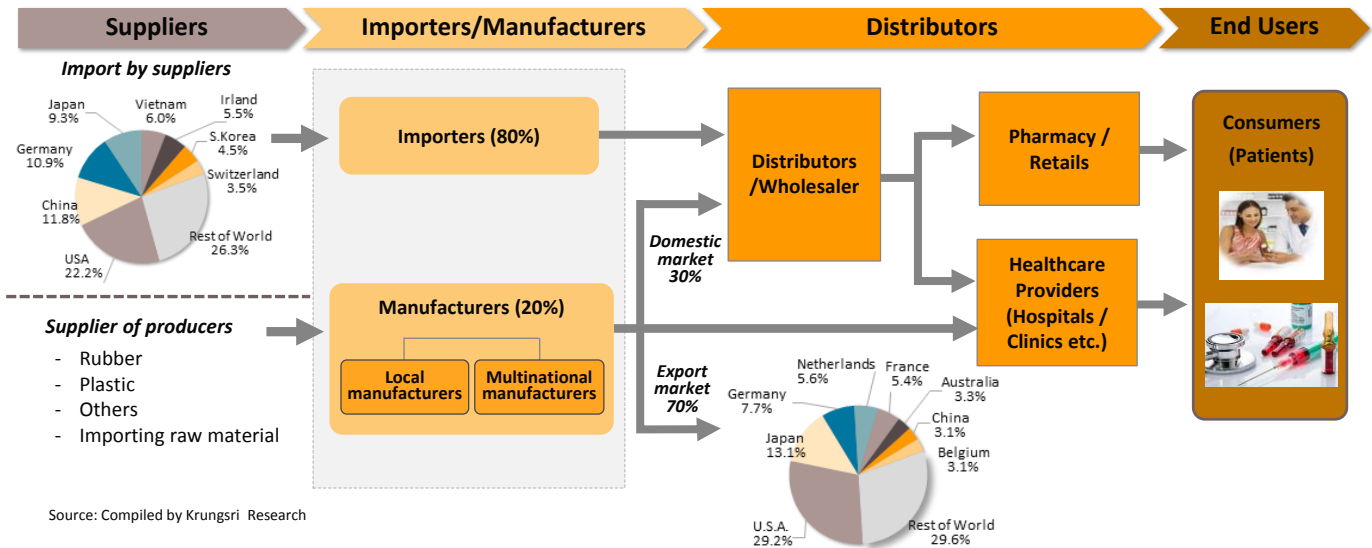
Source: Business Online, compiled by Krungsri Research

Table 2: Major Domestic Medical Device Manufacturers

Company	Major share holders	Revenue 2016 (THB, m)
Nipro (Thailand)	Japanese	7,412.9
Hoya Optics (Thailand)	Dutch	6,573.8
Kawasumi Laboratories (Thailand)	Japanese	2,465.5
Reckitt Benckiser Healthcare Manufacturing (Thailand)	Thai	1,988.5
Meditop	Thai	1,524.0
GE Medical Systems (Thailand)	US	1,471.0
Eyebiz Laboratory (Thailand)	Australian	1,348.7
Emerald Nonwovens International	Chinese	1,266.0
Infus Medical (Thailand)	Thai	889.9

Source: Business Online, compiled by Krungsri Research

Figure 8: Thai Medical Device Industry Value Chain



2) Distribution to intermediary companies, representatives or to shops: This type of distribution may be to companies which are part of the same commercial network as the producer or importer, or to general shops as a way of reaching target customers in the country. Players in this group typically have some knowledge of healthcare and so are able to exploit a range of distribution channels.

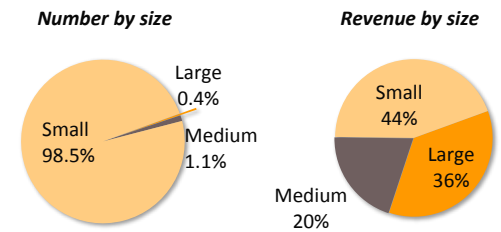
3) Distribution on export markets: The majority of goods distributed in this way are single-use devices bound for the main markets of the United States, Japan, and Germany. A major player in this group is the Thai Rubber Latex Corporation, which exports disposable latex medical gloves.

Distributors of medical devices include both wholesale and retail operations^{2/}. Over 10,000 operators are active in the sector and of these, almost all (99%) are SMEs, which together take 60% of income (Figure 9). Major distributors include Zuellig Pharma, Pharmahof, Proctor and Gamble Trading (Thailand), Bionet-Asia, Biogenetech, Medtronic (Thailand), B. Braun (Thailand) and Technomedical. **Within this group, competition is fairly strong** since there are only low barriers to entry and products tend to lack distinguishing features, making it easy for consumers to switch to products sold by competitors.

Opportunities for profit-making on the Thai market by producers and importers of medical devices are somewhat limited for a number of reasons. (i) Distributors focus on sales to government-funded hospitals, which entails competitive bidding and this exposes operators to competition on price. (ii) The majority of medical equipment that is imported has a long lifecycle and so new replacements are sourced only infrequently. (iii) Producers and importers of raw materials, parts, and equipment face increased costs as a result of currency hedging, while at the same time, the costs of imports fluctuate in line with changes in technology and innovation and this tends to have an impact on profitability.

The growth of the sector depends on expansion in the provision of healthcare and on support from the government. At present, and to the benefit of the sector, the latter is taking more concrete form with the Board of Investment's offering of tax incentives to investors in the manufacture of medical devices. In addition, the medical device sector is one of the 'new S-curve' industries and as such it is the beneficiary of government support for investment in the Eastern Economic Corridor (EEC). The government also plans for the country to become a medical hub and a center for the export of medical devices to the CLMV countries, which are seeing increasing demand for medical devices. Beyond this, the 12th National Economic and Social Development Plan (2017-2021) specifies the manner in which the medical device sector should develop in order to coincide with the 20-Year National Strategy. Under this, at first, emphasis is to be placed on the development of capabilities in the sector in areas which see high levels of domestic demand and which do not require the mastery of complicated, advanced technologies. This move has attracted the interest of investors, who are increasingly investing in the sector, although the outcome of this is that competition has also increased, driven up by growth in the number of operators.

Figure 9: Thai Medical Device Distributors (2016)



Source: Business Online, compiled by Krungsri Research

^{2/} This refers to the wholesale and retail of medical products including instruments, tools, equipment, treated bandages, first-aid kits, birth control products, and pharmaceutical products.

▲ Situation

The market for medical devices in Thailand gains from the advantages it enjoys in the quality of service and the standard of treatments, and this is supporting progress towards becoming a **medical hub** (Table 3). In addition, the 'medical hub' policy, which has been in place since 2003 has helped to support continuous growth in medical tourism and the number of foreign patients seeking treatment in Thai healthcare facilities has grown to the point where now some 2.5 million patients arrive in Thailand annually. Therefore, Thai medical device industry has expanded continuously in both domestically and internationally. **Over the five years between 2012 and 2016, the value of medical devices distributed to the domestic and export markets, which are split by value approximately 30:70, grew by 8% and 3.1% per year, respectively. In 2016, the total value of the Thai medical devices market was THB 41.65 bn, up 4.7% YoY, while the export market was worth THB 96.7 bn, up 4.5% YoY (Figure 10).**

Data from a survey by Business Online show that in 2016, based on the responses of 150 operators, **income for manufacturers of medical devices totaled THB 32.8 bn, up 3.1% YoY.** However, while large operators' growth averaged 4.0% YoY, for SMEs, the figure was at the much lower level of 1.7% YoY. The same survey (of 1,270 distributors) shows that total **income for distributors was THB 197.9 bn, up 7.7% YoY** due to continuous expansion in demand for medical devices, particularly of consumables (figures 11 and 12).

In 2017, the value of exports of medical devices^{3/} continued to rise from the 2016 figures, up 5.9% YoY to THB 102.48 bn. Demand from the most important export markets of the United States, Japan, and Germany, which together took 45% of all exports, grew by 2.2% YoY. In terms of the types of goods exported, the largest, with 84% of all exports and a value of THB 85.77 bn, was single-use devices. This group grew 5.9% YoY in 2017. Durable medical devices accounted for 16% of the total and exports of these were worth THB 16.20 bn, up 4.8%. Reagents and test kits represented a mere 0.5% of the total (THB 0.5 bn) but growth from 2016 was a surprising 98.0% YoY. This was driven by a 381% YoY jump in exports to Japan as Japanese producers began to use Thailand as a manufacturing base from which to export test and diagnostic kits for use by the elderly in Japan.

However, **imports of medical devices moved in the opposite direction, with a slight fall of -0.6% YoY in 2017 to THB 62.13 bn.** **Single-use devices**, which with 42% of all imports by value were again the largest group, grew 4.6% YoY to THB 26.23 bn. Reagents and test kits accounted for 17% of all imports and with a value of THB 10.51 bn, imports of these also grew, here by 6.9% YoY. Falls were seen, however, in imports of durable medical devices. This group represented 41% of imports and the value of imports of these fell by -8.0% YoY overall, with imports from the major suppliers of the United States, Germany, and Japan shrinking by -4.2% (figures 13 and 14).

Table 3: Thai Medical Service Hub Competitive Advantages

Competitive advantage	Thailand	Singapore	India	Malaysia	S.Korea
Service / hospitality	●●●●●	●●	●	●	●
Hi-tech hardware	●●●●	●●●●	●●	●	●●●
HR quality	●●●●	●●●●	●●	●●	●●●
JCI accredited organization	61	22	36	14	28
Synergy/strategy partner	●●●	●●	●	●●	●●
Accessibility	●●●	●●●	●	●●	●●
Reasonable cost	●●●●	●●	●●●●	●●●	●●

Source: Department of Health Service Support/JCI-Accredited Organizations

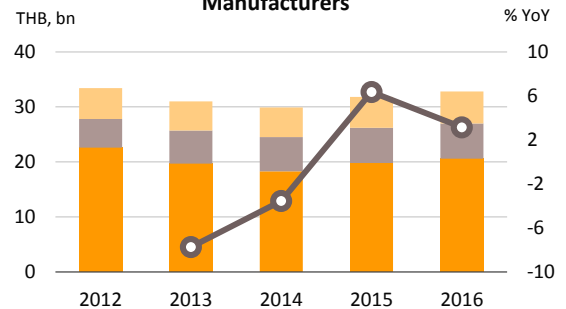
Note: ● Low competition ●●●● High competition

Figure 10: Thai Medical Device Trade



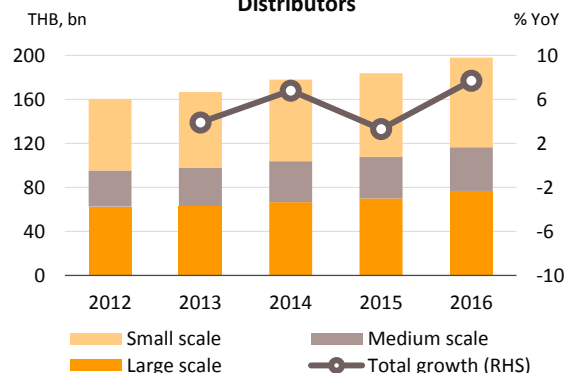
Source: MeDIU

Figure 11: Revenue of Thai Medical Device Manufacturers



Source: Business Online, compiled by Krungsri Research

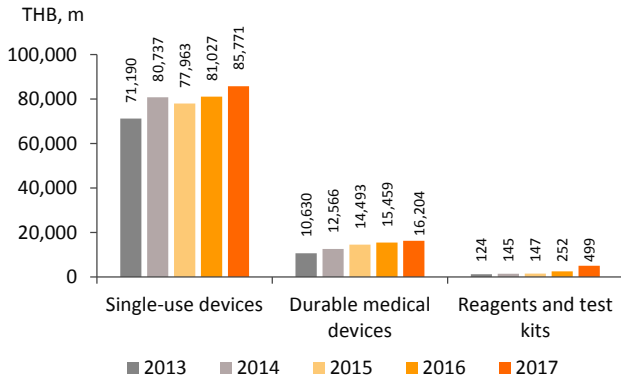
Figure 12: Revenue of Thai Medical Device Distributors



Source: Business Online, compiled by Krungsri Research

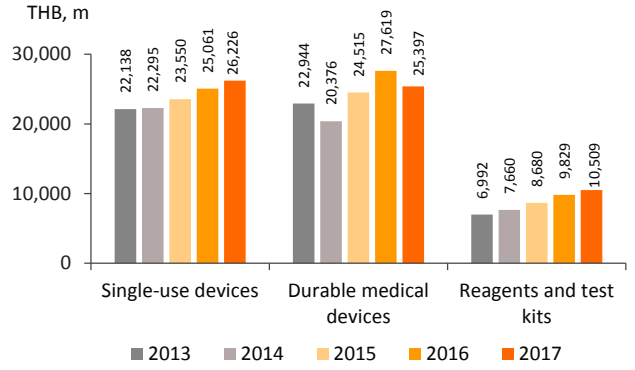
^{3/} Export data collected from Medical Device Intelligence Unit, the Plastics Institute of Thailand

Figure 13: Exports from Thailand of Medical Devices by Type



Source: MeDIU

Figure 14: Imports to Thailand of Medical Devices by Type

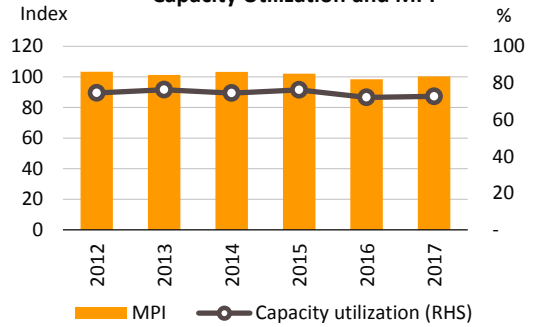


Source: MeDIU

The domestic output of medical devices is largely of single-use devices, especially of medical gloves. Capacity utilization in the sector has typically run in the range of 70% to 80% and in 2017, it averaged 72.74%, up slightly from the 2016 figure of 72.12%. At the same time, the manufacturing production index for medical devices rose to 100.29 from the index a year earlier of 98.39 (Figure 15) on increasing demand in domestic and export markets.

For 2017, Business Monitor International estimates that the value of medical devices distributed to the Thai market totaled THB 44.6 bn, up 7.1% YoY following an increase of 4.7% YoY in the previous year. The Krungsri Research reckons that the value of exports should expand by 7.2%, having grown by 4.5% in 2016 and that growth will be seen in all types of products, though especially so in reagents and test kits, a product group with significant potential because of government support to promote exports and research and to further establish Thailand as a production base for upstream industries such as this.

Figure 15: Domestic Medical Devices: Capacity Utilization and MPI



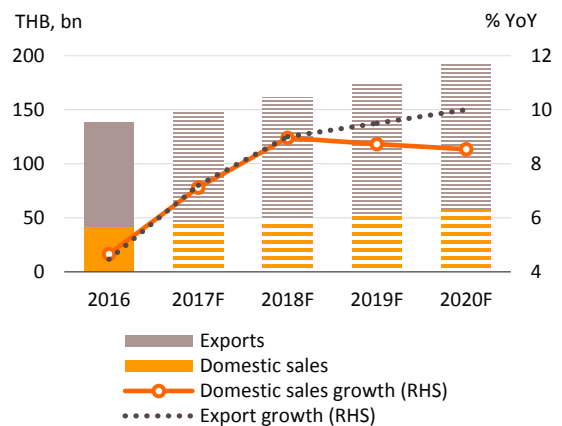
Source: Office of Industrial Economics (OIE)

▲ Outlook

Over the period 2018-2020, the forecast is for average growth of 8.7% per year in the value of medical devices distributed to the domestic market, while exports are forecast to increase by 9.5% YoY on the average (Figure 16). This growth will be supported by the government’s policies, demand and supply growth as follows:

1) Government policy to promote investment in the medical device sector by offering special privileges and to make budget allocations to support research and development to increase the sector’s potential will help to secure growth. The government’s plans to establish Thailand as an ASEAN medical hub and a center for the export of medical devices by 2020, and the sector’s designation as one of the ‘new S-curve’ group of industries and with that, its inclusion in investment promotion strategies, especially those targeting the Eastern Economic Corridor, will also underpin increased investment.

Figure 16: Thai Sales and Exports of Medical Devices



Source: Business Monitor International (BMI), Note: Export forecast by Krungsri Research

2) Levels of ill-health in the Thai population, particularly of certain conditions such as heart disease, strokes, cancers, and diabetes (Figure 17) will tend to continue to increase, as will the number of elderly in Thai society and this will support increased demand for healthcare and for high-technology interventions. This rapid aging is seen in the fact that the Office of the National Economic and Social Development Board estimates that the number of elderly in Thailand (defined as those over 60) will increase from the present figure of 9.1 million individuals to 10.3 million by 2019.

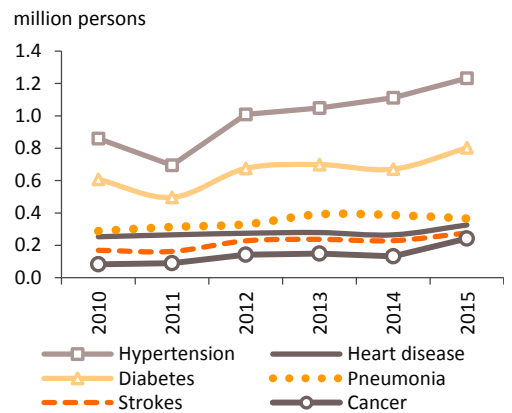
3) The number of foreign patients seeking Thai medical treatment is likely to pick up. Thailand has comparative advantages in terms of the quality and standard of treatment when compared to its competitors in the ASEAN region. Every five years, the National Statistical Office conducts a survey of private-sector hospitals and clinics and the most recent survey (2012) shows that some 6.5% of all private-sector patients are non-Thais and that this proportion is tending to increase. This growth is partly driven by the growing numbers of non-Thais working in Thailand and nearby countries and partly by growth in both general tourism and in medical tourism, which together account for around 70% of foreign patients seeking treatment in Thai hospitals. It is expected that over the years 2018-2020, the number of non-Thai patients receiving treatment in Thailand will grow by 7-8% per year, having expanded by 5.1% in 2016-2017 and this growth will also support growth in demand for medical devices.

4) To meet growing demand from Thai and foreign patients, Thai operators have plans to expand investment in new hospitals and in new medical equipment, especially in specialized treatment centers for complicated conditions. Larger operations are in particular expecting to increase the number of branches which they run in order to serve a greater number of customers and so over the next three years, the expectation is that the number of hospital beds in the country will expand by a further 2,700 from the current total of 35,000 (Figure 18).

In terms of market openings and export opportunities, producers of reagents and test kits should see continuing growth, especially reagents and test kits for coronary artery disease which are major products seeing the biggest growth. In addition, demand for such products has risen due to the government's policy encouraging health checkup in community and Mobile Check Up. At the same time, there are at present only a few domestic producers and other ASEAN countries lack production facilities so this represents an opportunity for Thai operators. For those producing consumables, steady growth will also continue, helped by the increase in the provision of healthcare services and the fact that single-use devices such as disposable gloves and syringes.

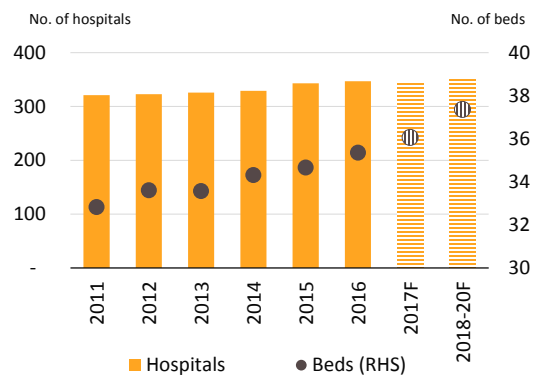
Competition is likely to be more intensified as investment by foreign manufacturers expands in response to BOI investment promotion strategies and the waiving of import duty on parts and raw materials for use in research and development (in 1H17, a total of 19 projects with a value of THB 3.6 bn applied for investment support compared to 10 in 1H16). Investment in the sector and to help secure Thailand's position as a medical hub, including those aimed at the elderly, innovative consumables, implants, and parts for electrical and radioactive diagnostic equipment. Japanese operators are in particular interested in continuing to use Thailand as a manufacturing base. This may therefore increase levels of competition. Simultaneously, large operators will need to import manufacturing equipment and will therefore face financial risks from exposure to currency fluctuations and from changes in costs arising from shifts in technology and innovation. This will be especially so for goods which have to be held in stock and these factors will all tend to put downward pressure on profits.

Figure 17: No. of Patients in Thailand by Disease



Source: Ministry of Public Health (MOPH)

Figure 18: Number of Private Hospitals & Beds



Source: MOPH
Note: Forecast by Krungsri Research

▲ **Krungsri Research's view:** Income for manufacturers and distributors of medical devices will tend to grow at a rate similar to that which has prevailed recently. However, the level of competition will tend to rise and this will restrict operators' profitability to the mid-range.

Manufacturers of medical devices: Operators in this group are likely to see continuing growth in income but rising levels of competition will tend to put a cap on profit rates, which will likely be at average levels. Manufacturers which supply hospitals, especially private-sector hospitals plan to invest in new buildings and equipment, will be at the higher end of the scale. On the positive side, government support for the development of the Eastern Economic Corridor and the building of Thailand as a 'medical hub' presents producers with the possibility of opening new markets in neighboring countries. However, increasing competition, especially from foreign companies which are investing in Thai production facilities to export back to their home countries of, for example, Japan, the United States, and France is likely and producers also face the possibility of rising costs when importing manufacturing equipment and from losses on exchange rate variations and these will tend to hold profits to middling levels.

Distributors of medical devices (including retailers, wholesalers and importers): Income for this group should grow gradually in an environment of strengthening competition. Single-use devices account for a large share of the income of this group and these items are typically considered essentials in day-to-day operations in hospitals, so demand should remain steady. However, competition is likely to stiffen and SMEs in this group will tend to be at a disadvantage relative to larger operators, particularly in terms of costs and marketing. Competition will also increase with agencies and shops which are part of large manufacturers' commercial networks and which are therefore able to exploit a wider range of distribution channels. **Importers of medical devices** are also typically large operators and these are therefore better able to plan stocking and to manage problems arising from increasing import costs. These operators will therefore be less affected by fluctuations in costs.

KRUNGSRI RESEARCH

Somprawin Manprasert, Ph.D.

Phornphan Phoksuphat

Head of Research Division and Chief Economist

Head of Macroeconomic and Industry Research

Macroeconomic Team

- Sarun Sunansathaporn
- Sujit Chaivichayachat
- Churailuk Pholsri
- Soison Lohsuwannakul
- Kongphop Wongkaew
- Tanaporn Sriklay

Head of Strategic Economics
 Head of Forecasting and Macroeconomic Research
 Senior Economist
 Senior Economist (Regional Economics)
 Economist
 Economist

Industry Team

- Chetchuda Chuasuwan
- Taned Mahattanalai
- Poonsuk Ninkitsaranont
- Piyanuch Sathapongpakdee
- Narin Tunpaiboon
- Puttachard Lunkam
- Niratsai Toomwongsa
- Wanna Yongpisanphob
- Patchara Klinchuanchun

Head of Agricultural and Industrial Sectors
 Head of Service and Real Estate Sectors
 Senior Analyst (Healthcare, Modern Trade, ICT)
 Senior Analyst (Transportation & Logistics, Industry Risk Ratings)
 Senior Analyst (Power Generation, Biofuel, Chemical & Plastic Products)
 Analyst (Tourism Sectors, Real Estate in Upcountry)
 Analyst (Construction Contractor, Construction Materials)
 Analyst (Automobile, Electronics & Electrical Appliances, Beverages)
 Analyst (Real Estate in BMR)

Intelligence Team

- Talublugkhana Thanadhidhasuwanna
- Rachot Liengchan
- Arpakorn Nopparattayaporn

Senior Analyst (Financial Sectors)
 Analyst (Oil & Gas, Petrochemicals, Industry Scenario Analysis)
 Analyst

MIS and Reporting Team

- Suratchanee Somprasong
- Thamon Sernsuksakul
- Chirdsak Srichaiton
- Wongsagon Keawuttung

Administrator
 Administrator
 MIS Officer
 MIS Officer

For research subscription, contact krungsri.research@krungsri.com

Disclaimer

This document is based on public information believed to be reliable. Nevertheless, Krungsri Research would not affirm the accuracy and completeness of this information. The opinions expressed in this document are our own, which are not necessarily the opinions of Bank of Ayudhya. We reserve the right to change opinions or forecast without prior notice.