

TURKISH PHARMACEUTICAL MARKET 2017



IEIS

PHARMACEUTICAL MANUFACTURERS
ASSOCIATION OF TURKEY

Turkish Pharmaceutical Market 2017



August 2018

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INTRODUCTION

The pharmaceutical industry is of strategic and economic importance for a country in terms of its direct impact on human life through healthcare and therapeutical services, as well as for its potential offerings based on advanced technology.

The Turkish pharmaceutical industry has the potential to compete with the developed markets. Our long-standing culture of production, qualified human resources and high export performance are the key drivers of this potential.

With more than 11 thousand products, 75 facilities meeting the highest international standards, 10 raw material production sites, 30 R&D centers accredited by the Ministry of Industry and Technology, an approximate total of 500 organizations and 35 thousand employees, we currently export to over 160 countries.

As the Pharmaceutical Manufacturers Association of Turkey (İEİS), by 2023, we maintain our efforts towards making our country, a global manufacturer and exporter of greater R&D competence and higher value added output, specifically in biotechnology without interruption.

With R&D, production, employment and export at the heart of our vision, we strive for the future of both our country and industry.

With this vision in mind, our priority is to guide the pharmaceutical industry by gathering and thoroughly analyzing market-related and macroeconomic data in this domain.

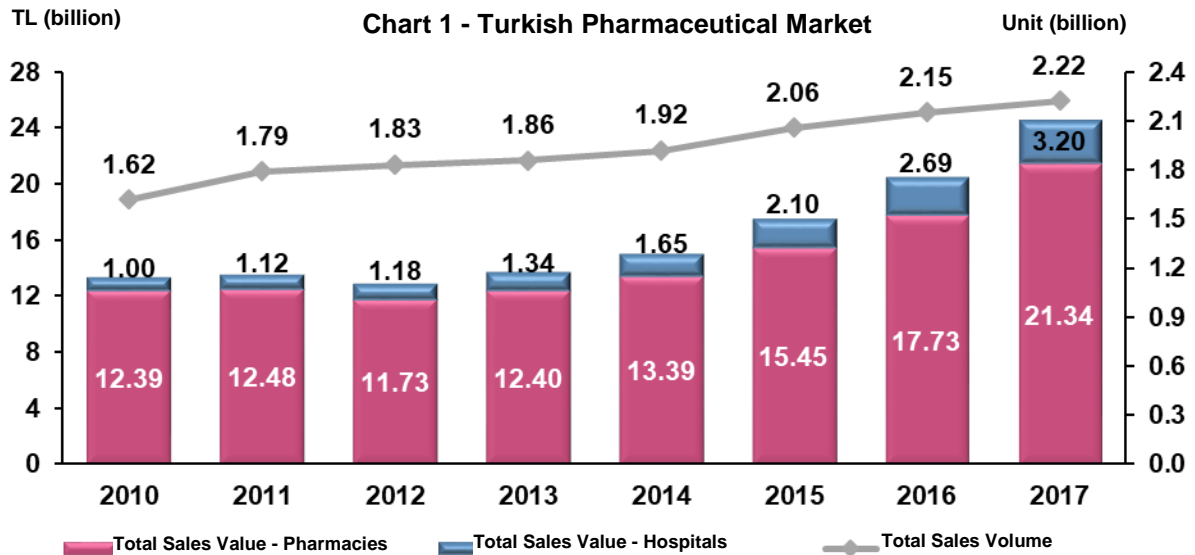
To this end, we have issued the Turkish Pharmaceutical Market 2017 report that analyzes 2017 and the past eight years. In this study, we offer an analysis of the Turkish pharmaceutical market in different categories including originator and generic products, import and local products, and biotechnological products, in terms of market structures and prices.

Furthermore, the Turkish pharmaceutical market's products are analyzed with a focus on biocidal products licensed by the Ministry of Health, medical devices in pharmaceutical form, specialty medical food, cosmetic and derma-cosmetic products; vitamins authorized by the Ministry of Agriculture and Forestry, food supplements and infant formulas. Our report also features an analysis of data regarding investment incentives, R&D, production, employment, and foreign trade.

It is with great pleasure that we hereby present the Turkish Pharmaceutical Market 2017 Report to all our stakeholders in the public, academic and private sector realms. We hope the report will attract considerable attention and contribute to the development of our industry.

1. The Turkish Pharmaceutical Market

In 2017, the Turkish pharmaceutical market grew in value by 20.2% in the hospital and pharmacy channels, reaching 24.54 billion TL. Unit sales rose by 3.4% to 2.22 billion units. From 2010 to 2017, the hospital market raised its value share from 7.5% to 13.1%, expanding its unitshare of the total from 8.3% to 12.7%.



Source: IQVIA, IEIS

An analysis of the 8-year period between 2010 and 2017 indicates that the pharmaceutical market grew by 83.2%, rising to 24.54 billion TL in 2017 from 13.39 billion TL in 2010. This growth signifies a compound annual growth rate (CAGR) of 9%, which corresponds to a real increase of just 3.4% when taking into account the manufacturer price inflation of 77.3% in the same period.

In volume terms, the pharma market marked 2.22 billion units in 2017, up 37.4% from 1.62 billion units in 2010. This increase denotes a compound annual growth rate (CAGR) of 4.6%. Increased access to public healthcare services and personnel, a higher average life expectancy and the growing and aging population lie behind this expansion.

An analysis of companies operating in the sector reveals that the number of sector players rose from 441 in 2010 to 492 in 2017. In term of the domestic-multinational capital breakdown, in 2010, the number of multinational companies operating in the sector totaled 109, whereas the number had soared to 120 for 2017. In the meantime, with 40 local companies entering the market in 2017, the total number of local companies registered at 372.

Multinational companies receded to a 66% market share on the value scale, decreasing by 1 percentage point over the past eight years. On the other hand, in 2010, 90% of the market was accounted for by 50 companies. In the span of eight years, the leading companies in the market lost market share and the number of companies making up 90% of the market rose to 65 in 2017. The share of foreign capital companies in this pie is 69%.

Analysis of the pharmaceutical market breakdown reveals that there has been a 0.1 percentage point fall in the share of prescription products.

Table 1 - Breakdown of Pharmaceutical Market

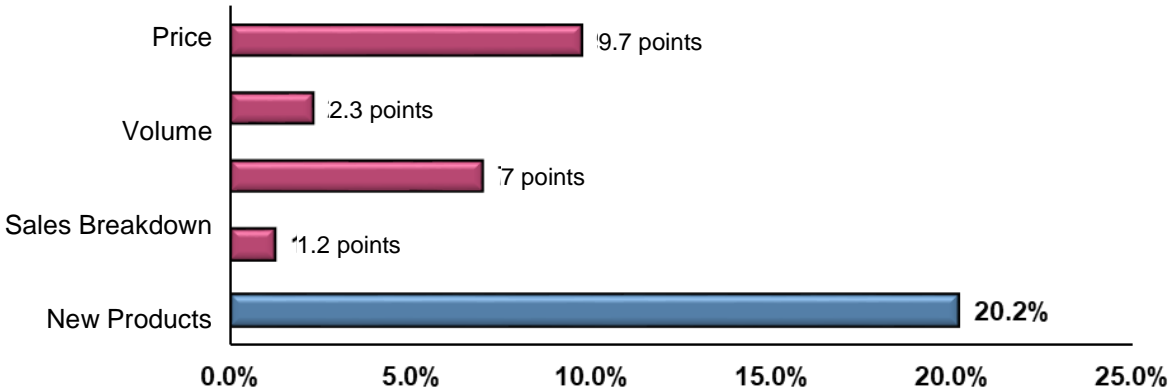
| | 2010 | | 2017 | |
|-------------------------|--------------------|---------------|--------------------|---------------|
| | Value (billion TL) | Share | Value (billion TL) | Share |
| Products | 13.39 | 100.0% | 24.54 | 100.0% |
| Prescription | 13.35 | 99.7% | 24.45 | 99.6% |
| Reimbursed | 13.02 | 97.2% | 23.37 | 95.2% |
| Non-reimbursed | 0.33 | 2.5% | 1.08 | 4.4% |
| Non-prescription | 0.05 | 0.3% | 0.09 | 0.4% |
| Reimbursed | 0.02 | 0.2% | 0.03 | 0.1% |
| Non-reimbursed | 0.02 | 0.2% | 0.06 | 0.2% |

Source: IQVIA, IEIS

1.1. Market Growth and Sources

As for the sources of market growth in 2017, four main factors are found to contribute to growth in value terms : Volume and price increases in the current portfolio, new products entering the portfolio, and changes in the sales distribution.

Chart 2 - Sources of Growth



Source: IQVIA, IEIS

A. Price

As one may recall, in February 2017, the currency rate that established medicine prices increased by 10.65%. Accordingly, 9.7 points (TL 1,984 million) out of the year-over-year 20.2% growth in 2017 derives from this price increase.

B. Volume

2.3 points (465 million TL) of the market growth stemmed from the rise in volume (units) of the current product portfolio.

C. Sales Distribution

Changes in the sales distribution of current products in the market, in other words the changes in the sales volume towards higher priced products, contributed to growth by 7 points (TL 1,420 million).

D. New Products

New products that entered the market in 2017 offered a 1.2 point (253 million TL) contribution to growth.

In 2017, 475 new products were introduced to the market, namely 459 chemical and 16 biotechnological.

Among the new products launched, the highest market share in terms of units belonged to the cardiovascular therapeutic group. The new entries were the following: 46 (9.7%) cardiovascular, 45 (9.5%) antibiotics, 44 (9.3%) oncology and nervous system, 36 (7.6%) antirheumatic, 34 (7.2%) respiratory, 28 (5.9%) dermatological products. Of the new products in the market 58.3% are associated with these therapeutic groups.

Of the new originator and generic products in the market, a total of 105 originator products, namely 94 chemical and 11 biotechnological, were launched in 2017. Of these 105 products sold at an average of TL 38, 26 are produced in Turkey, and only 17 have a generic competitor.

The remaining 370 are listed as 365 chemical generics and 5 biosimilars. Only 17 of these products are in the import products category. Therefore, we observe a trend towards generic local products among the new market entrants. The average price of generic products is 8 TL.

Table 2 - Unit Distribution of the New Products in the Market

| | 2017 |
|-------------------|------------|
| Products | 475 |
| Originator | 105 |
| ▪ Has generic | 17 |
| ▪ No generic | 88 |
| Generic | 370 |
| ▪ Import | 17 |
| ▪ Local | 353 |

Source: IQVIA, IEIS

1.2. Market Structure

A. Originator-Generic Products

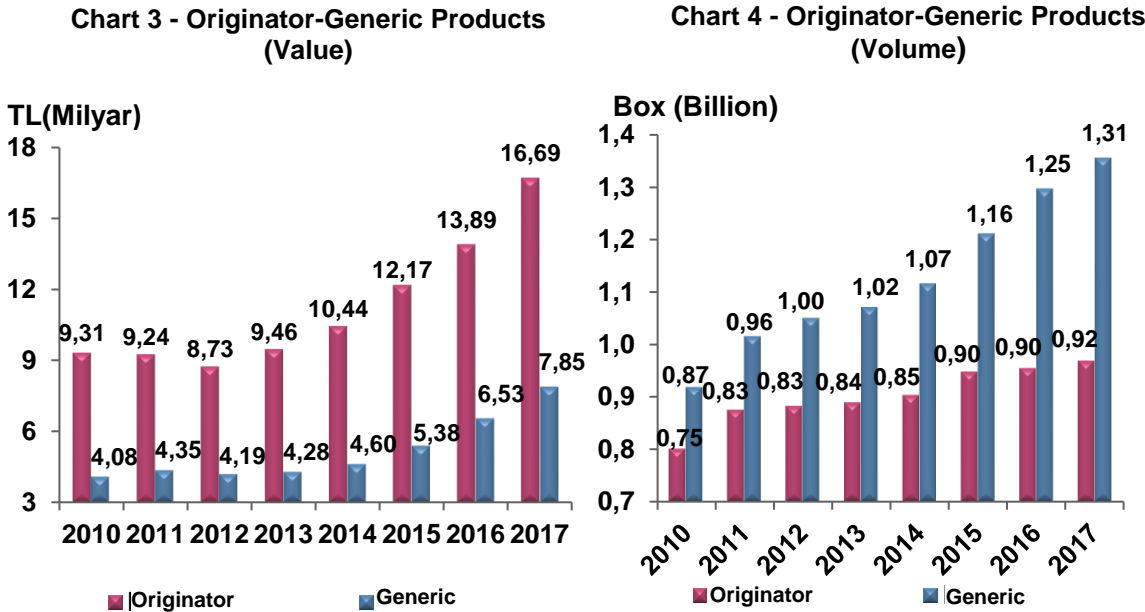
The originators market, recorded at TL 13.89 billion in 2016, climbed to TL 16.69 billion in 2017 with a 20.1% increase. On a unit basis, 0.92 billion units were sold, marking a growth of 1.6%.

As for the generic product market, in 2017, the figure hit TL 7.85 billion, up by 20.3%. On a unit scale, generic products grew by 4.7%, reaching 1.31 billion units.

Over the past eight years, the value of originator medicines has risen by 79.1%. This growth signals a compound annual growth rate (CAGR) of 8.7% and a real increase of 1.1%. In the same period, the sales volume for originator branded medicines rose 22.4%.

From 2015 to 2017, the value of generics has outpaced market growth, taking market share from originator medicines. Between 2010 and 2017, generic products gained a total of 92.5% in value.

The figure is 9.8% and 8.6% for the CAGR and real growth rate, respectively. Looking at the units, the 9% rise of 2015 was followed by a stagnant upward trend, resulting in average unit growth of 50.4% over the 2010-2017 period.



Source: IQVIA, IEIS

In 2017, generic products marked a 32% and 58.7% market share in value and unit terms, respectively.

Chart 5 - Originator-Generic Products Market Share (Value)

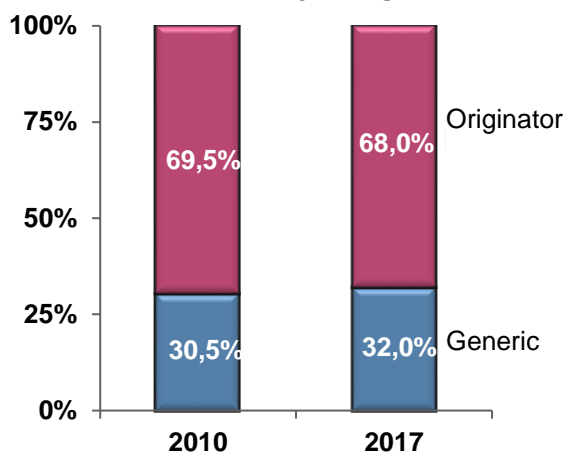
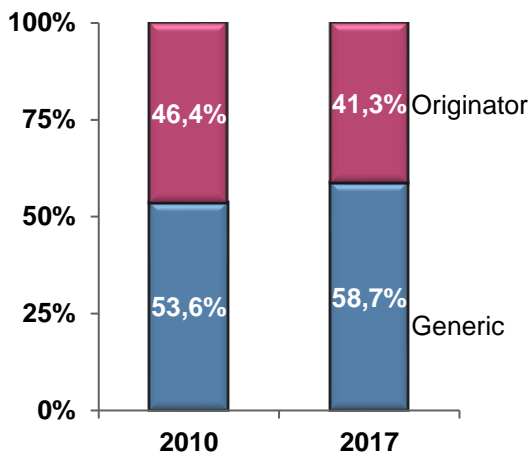


Chart 6 - Originator-Generic Products Market Share (Volume)



Source: IQVIA, IEIS

Regarding the import-local breakdown of originator-generic products, in 2017, these made up 78% of total value, whereas 43% were import products on a unit basis. Meanwhile, almost all generic products are locally manufactured. It is thought that the foreign GMP audits of the Ministry of Health play a role in the downsizing of the import generic products market. Localization efforts are expected to impact this process.

Table 3 - Originator-Generic Products Breakdown

| | ORIGINATOR PRODUCT | | | | GENERIC PRODUCT | | | |
|-------------|--------------------|------------|------------|------------|-----------------|------------|-----------|------------|
| | 2010 | | 2017 | | 2010 | | 2017 | |
| | Import | Local | Import | Local | Import | Local | Import | Local |
| UNIT | 38% | 62% | 43% | 57% | 5% | 95% | 3% | 97% |
| (mn) | 287 | 464 | 395 | 524 | 44 | 824 | 36 | 1,269 |
| TL | 77% | 23% | 78% | 22% | 10% | 90% | 5% | 95% |
| (mn) | 7,186 | 2,128 | 12,940 | 3,747 | 426 | 3,652 | 391 | 7,462 |

Source: IQVIA, IEIS

B. Import-Local Products

In 2017, import products expanded by 17.4% to TL 13.33 billion. Units sold printed at 0.43 billion, down by 0.9% year-over-year.

Between 2010 and 2017, import products rose by 75.1% in value. This growth indicates a CAGR of 8.3% and a real recession of 1.2%. In the same period, import products rose by 30.2% in unit terms.

Local products, on the other hand, have outgrown the market over the past two years. In 2017, import products expanded by 23.6% to TL 11.21 billion. The number of units sold rose to 1.8 billion, up by 4.5%.

Over the past eight years, local products have gained 93.9% in value. This expansion equates to a CAGR of 9.9%. This increase points to 9.4% real growth on a manufacturer price basis. Local products grew by 39.3% in unit terms.

Chart 7 - Import-Local Products (Value)

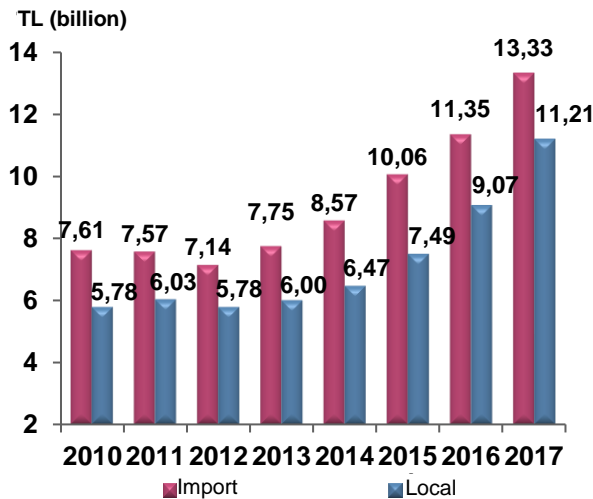
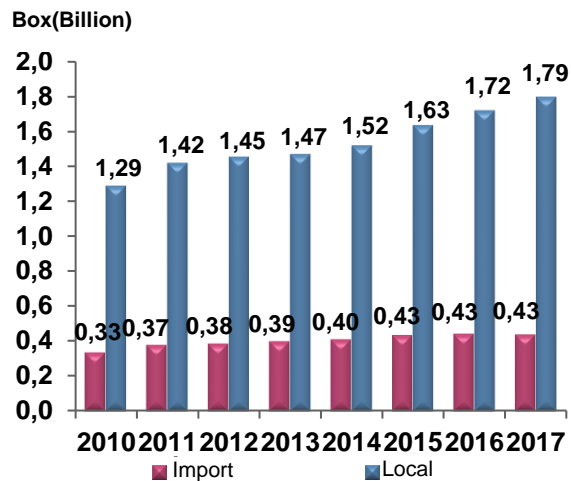


Chart 8 - Import-Local Products (Volume)



Source: IQVIA, IEIS

These developments culminated in the rise of local products from 43.2% in 2010 to 45.7% in 2017. These units, at 79.6% of the total in 2010, had reached 80.6% in 2017.

Chart 9 - Import-Local Products Market Share (Value)

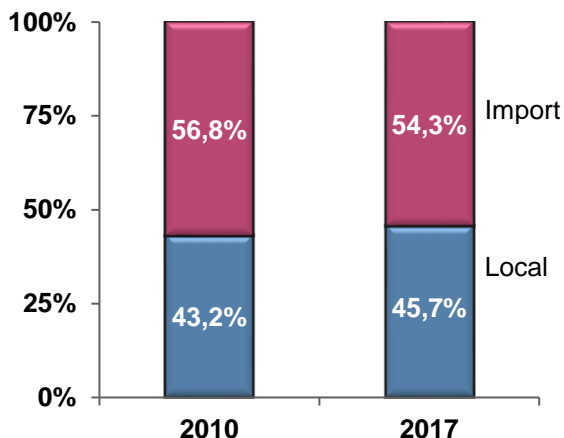
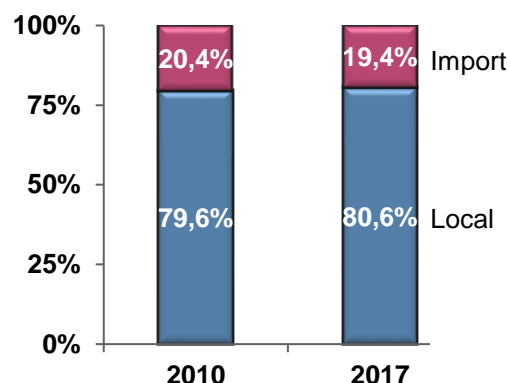


Chart 10 - Import-Local Products Market Share (Volume)



Source: IQVIA, IEIS

Originators constitute almost all of the import products, but continue to account for a smaller portion of locally manufactured ones. Generics claim a gradually increasing share among local products. In 2017, 67% of locally-manufactured products were generics on the value scale, and 71% on the unit scale.

Table 4 - Import-Local Products Breakdown

| | IMPORT PRODUCTS | | | | LOCAL PRODUCTS | | | |
|-------------|-----------------|------------|------------|-----------|----------------|------------|------------|------------|
| | 2010 | | 2017 | | 2010 | | 2017 | |
| | Originator | Generic | Originator | Generic | Originator | Generic | Originator | Generic |
| UNIT | 87% | 13% | 92% | 8% | 36% | 64% | 29% | 71% |
| (mn) | 287 | 44 | 395 | 36 | 464 | 824 | 524 | 1,269 |
| TL | 94% | 6% | 97% | 3% | 37% | 63% | 33% | 67% |
| (mn) | 7,186 | 426 | 12,940 | 391 | 2,128 | 3,652 | 3,747 | 7,462 |

Source: IQVIA, IEIS

C. Biotechnological Products

The worldwide use of biotechnological products has exceeded 20%, an uptrend that continues today. And Turkey is no exception to this trend. In 2017, biotechnological products claimed an approximate 19.5% of the prescription products market at TL 4.1 billion.

In the Turkish pharmaceutical market, there are 208 originator biotechnological products under 93 brands and 46 biosimilar products under 17 brands, adding up to a total of 254 different products of 110 brands. Seventeen types of biosimilars under six different brands are locally manufactured.

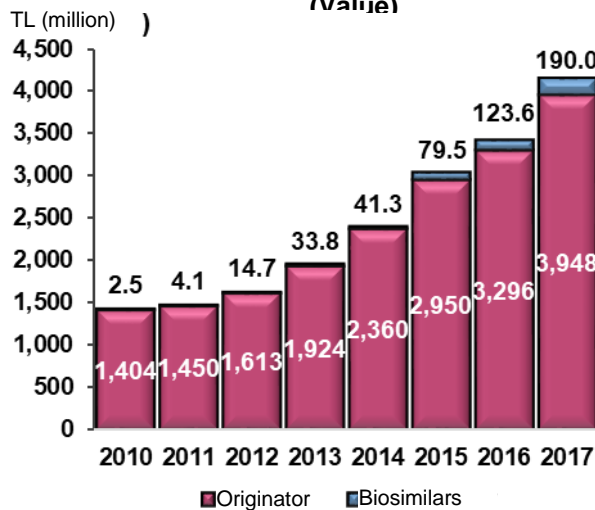
Efforts are underway for the local production of two originator biotechnological, 39 biosimilar and one biobetter products between 2018 and 2024. Local development and production of these products, for which we are currently import-dependent, will ease patient access to them, while reducing the foreign trade deficit, therefore significantly contributing to the national economy.

An analysis of the originator biotechnological products shows that the market, at around the TL 3.3 billion level in 2016 grew by 20% in 2017, reaching a total of TL 3.9 billion. In 2017, the biosimilar pharmaceutical market exhibited a 54% increase, rising to TL 190 million.

On a unit scale, biotechnological products reached a volume of 28 million units with an 8% increase in 2017. The unit sales for originator biotechnological products and biosimilars marked 4% and 31% year-over-year growth, respectively. Biosimilar unit sales in 2017 were recorded at 4.5 million.

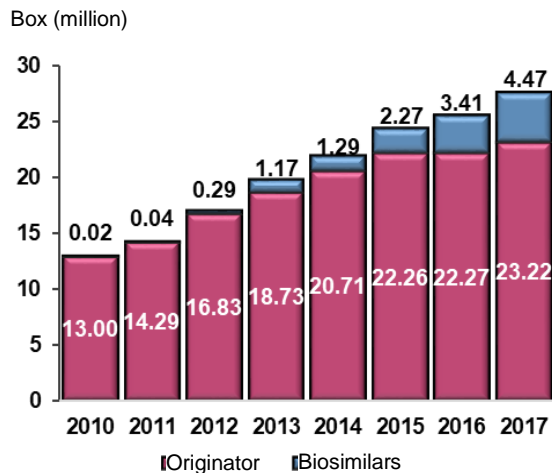
In Turkey, biosimilars that contain abciximab, epoetin alfa, filgrastim, insulin glargine, somatropin, infliximab, enoxaparin sodium, and recombinant human epidermal growth factor are licensed. Among them, those manufactured in Turkey contain the active ingredients of enoxaparin sodium, epoetin alfa, filgrastim, infliximab, and insulin glargine. With the patent expiration of originator biotechnological products, it is expected that the number of biosimilars will increase over the coming terms.

Chart 11 - Biotechnological Products (Value)



Source: IQVIA, IEIS

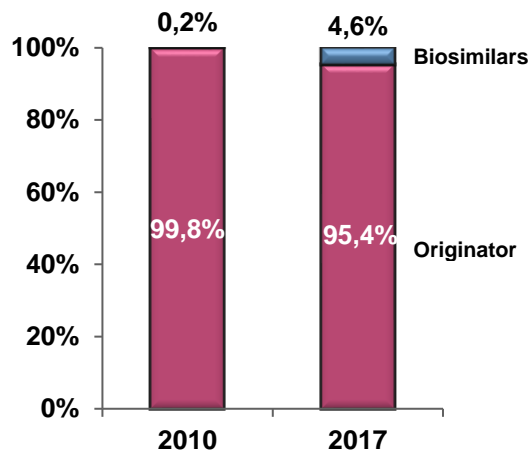
Chart 12 - Biotechnological Products (Volume)



Kaynak: IQVIA, IEIS

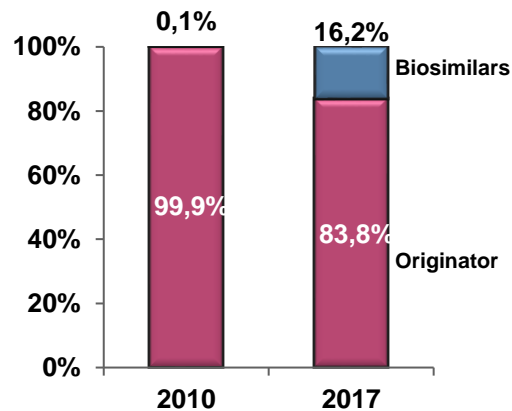
In 2010, biosimilars were almost non-existent among biotechnological products, whereas in 2017, they had a respective 4.6% and 16.2% share in terms of value and unit.

Chart 13 - Originator-Biosimilar Products Market Share (Value)



Source: IQVIA, IEIS

Chart 14 - Originator-Biosimilar Products Market Share (Volume)



Blood and hematopoietic biotechnological products have significantly expanded their market share within the biosimilars category. As for the originator biotechnological products market; antineoplastics, immunomodulatory agents, digestive system and metabolism products rank highest in value terms.

Table 5 - Biotechnological Products

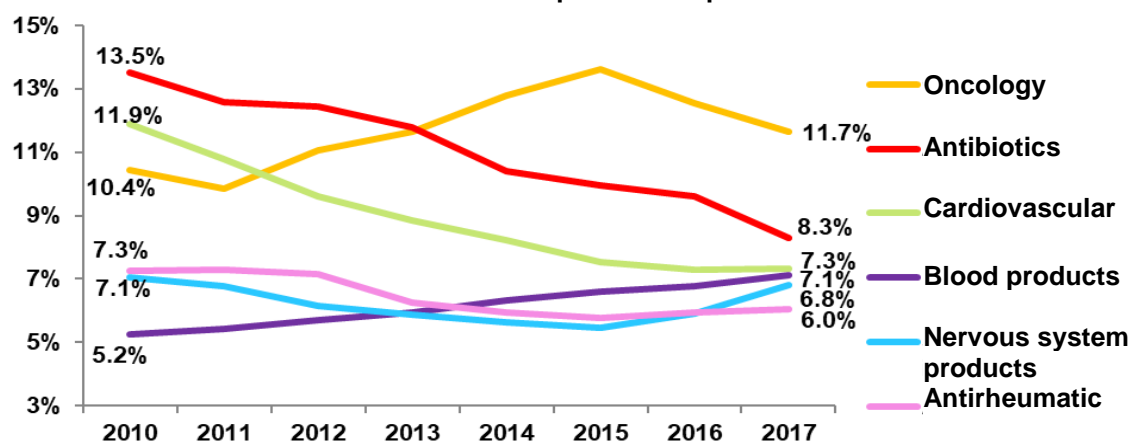
| | Unit | | Value | |
|--|-------------|-------------|-------------|-------------|
| | 2010 | 2017 | 2010 | 2017 |
| Biosimilars | 100% | 100% | 100% | 100% |
| Blood and Hematopoietic Organs | 0.00% | 86.28% | 0.00% | 53.70% |
| Antineoplastics and Immunomodulatory Agents | 100.00% | 5.87% | 100.00% | 30.69% |
| Digestive System and Metabolism | 0.00% | 6.09% | 0.00% | 8.98% |
| Systematic Hormonal Preparations (excluding Sex Hormones and Insulins) | 0.00% | 1.65% | 0.00% | 6.46% |
| Dermatological Products | 0.00% | 0.10% | 0.00% | 0.16% |
| Originator | 100% | 100% | 100% | 100% |
| Antineoplastics and Immunomodulatory Agents | 6.94% | 9.58% | 44.16% | 46.76% |
| Digestive System and Metabolism | 51.12% | 60.14% | 23.78% | 25.41% |
| Blood and Hematopoietic Organs | 35.07% | 20.62% | 17.28% | 11.30% |
| Ophthalmological | 0.12% | 1.13% | 1.50% | 6.53% |
| Systematic Hormonal Preparations (excluding sex hormones and insulins) | 1.88% | 2.60% | 4.13% | 2.84% |
| Respiratory System | 0.07% | 0.87% | 0.35% | 2.53% |
| Genital-urinary System and Sex Hormones | 3.28% | 4.40% | 3.76% | 2.41% |
| Systematic Anti-infectives | 1.52% | 0.33% | 5.04% | 1.26% |
| Dermatological Products | 0.00% | 0.02% | 0.00% | 0.50% |
| Musculoskeletal System | 0.00% | 0.31% | 0.00% | 0.46% |
| Cardiovascular System | 0.0000% | 0.0005% | 0.0000% | 0.0018% |

Source: IQVIA, IEIS

D. Therapeutic Groups

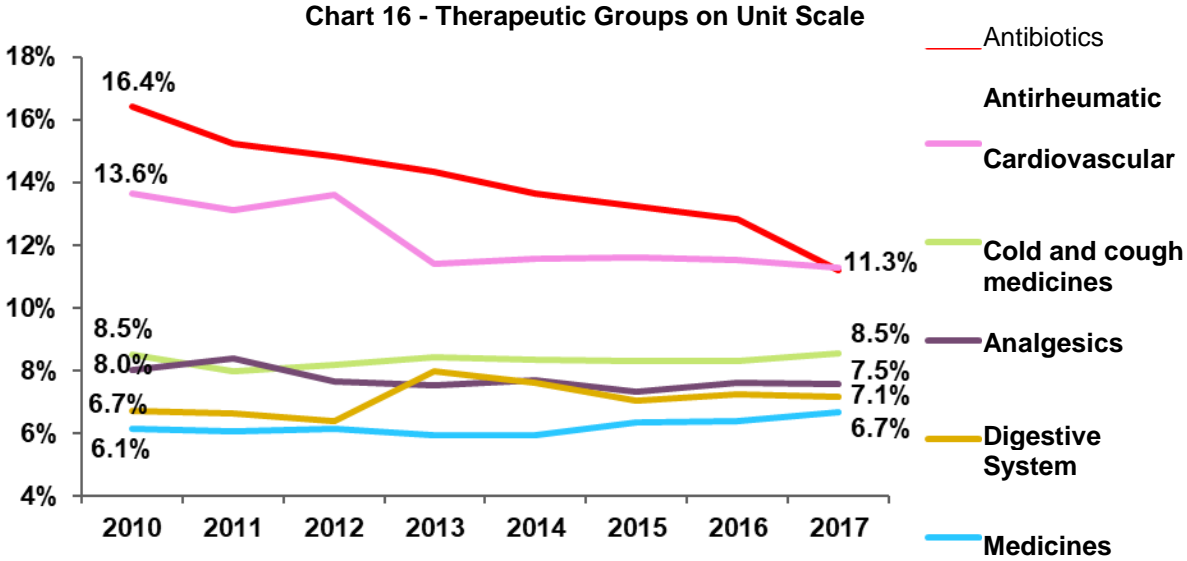
An analysis of the pharmaceutical market from the perspective of therapeutic groups indicates an upward trend in oncology and blood products over the past eight years. In 2017, although oncology products shrank compared to the previous year, they still stood out as the highest selling therapeutic group on the value scale with 11.7%.

Chart 15 - Therapeutic Groups on Value Scale



Source: IQVIA, IEIS

An analysis by unit reveals antibiotics and antirheumatic products to be the leading therapeutic groups on 11.3%, followed by cardiovascular products on 8.5%.



Source: IQVIA, IEIS

E. Average Prices

From 2010 through 2017, average product price increased by 33.4% to TL 11.03. That period indicates a 25% real shrinkage when the effect of inflation, which soared by 77%, is excluded.

An analysis of the change between 2016-2017 demonstrates that the 10.65% increase in the conversion currency used in the pricing of products in 2017 resulted in pharmaceutical market growth of 16%, originators of 18%, generics of 15%, import products of 19% and local products of 18%.

Table 6 - Distribution of Average Product Prices

| TL | Products | Originator | Generic | Import | Local |
|------|----------|------------|---------|--------|-------|
| 2010 | 8.27 | 12.41 | 4.70 | 23.00 | 4.49 |
| 2011 | 7.59 | 11.20 | 4.51 | 20.35 | 4.25 |
| 2012 | 7.05 | 10.49 | 4.19 | 18.78 | 3.98 |
| 2013 | 7.39 | 11.28 | 4.19 | 19.71 | 4.09 |
| 2014 | 7.84 | 12.24 | 4.32 | 21.27 | 4.27 |
| 2015 | 8.52 | 13.55 | 4.63 | 23.50 | 4.59 |
| 2016 | 9.49 | 15.36 | 5.23 | 26.10 | 5.28 |
| 2017 | 11.03 | 18.16 | 6.02 | 30.94 | 6.25 |

Source: IQVIA, IEIS

Table 7- Changes in Average Product Prices

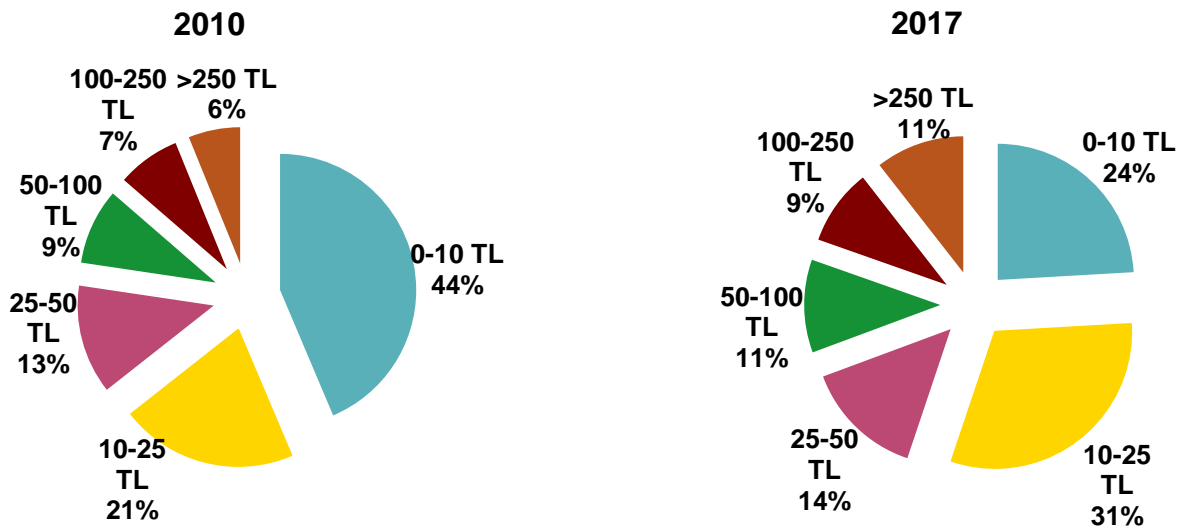
| Change | Products | Originator | Generic | Import | Local |
|-----------|----------|------------|---------|--------|-------|
| 2010-2017 | 33.4% | 46.4% | 28.0% | 34.5% | 39.2% |
| 2016-2017 | 16.3% | 18.3% | 14.9% | 18.5% | 18.3% |

Source: IQVIA, IEIS

F. Retail Price Ranges

The retail sales price distribution of products in the market from 2010 to 2017 shows a 20-point drop at the TL 0-10 price range. Fifty-five percent of the pharmaceutical market of 2017 comprised products priced at TL 25 and less. In 2017, the products with the highest share market (31%) were priced between TL 10 and TL 25.

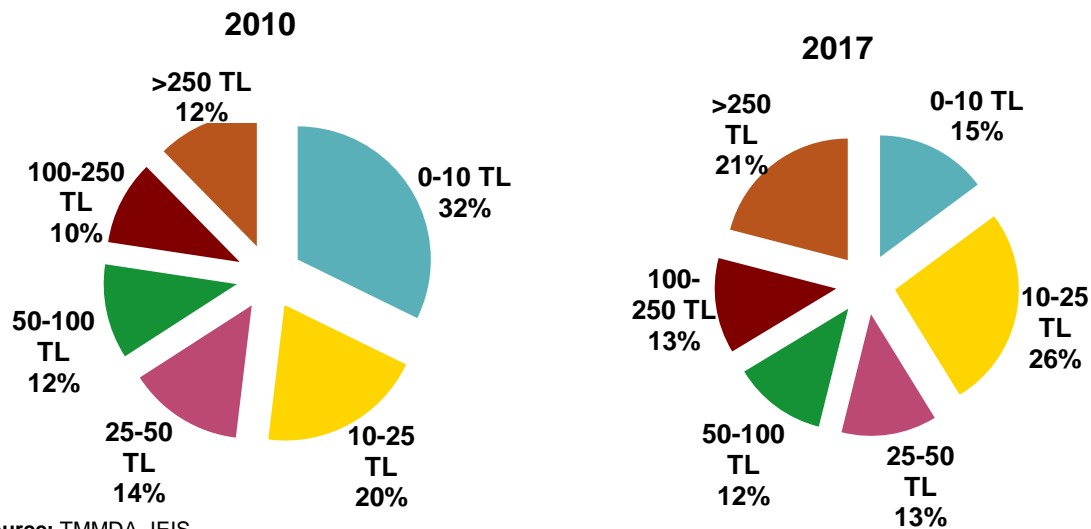
Chart 17- Retail Price Breakdown



Source: TMMDA, IEIS

The past eight years have witnessed a reduced share of originator products of the TL 0-10 price range, whereas originator products of above TL 250 have enjoyed the largest expansion. Still in the originator products, the group that saw the highest share in 2017, at 26%, was that of products priced in the TL 10-25 range. This group was followed by products priced above TL 250, with a 21% share.

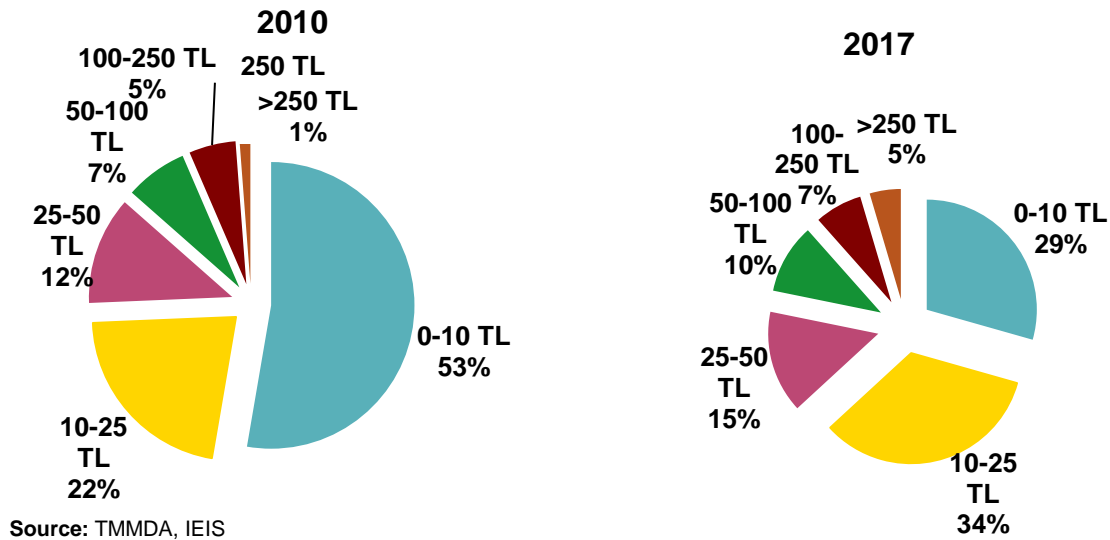
Chart 18- Price Breakdown of Originator Products



Source: TMMDA, IEIS

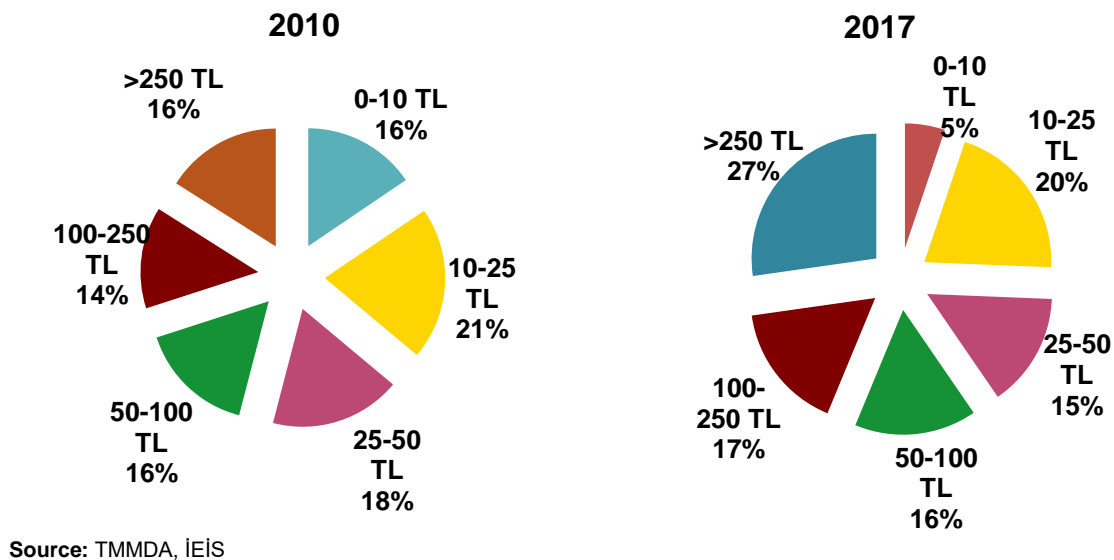
An analysis of the price range for generic products indicates that as of 2017 the products between TL 10-25 had the highest market share of 34%. The TL 0-10 price range, on the other hand, shrank by 23 points.

Chart 19 - Price Breakdown of Generic Products



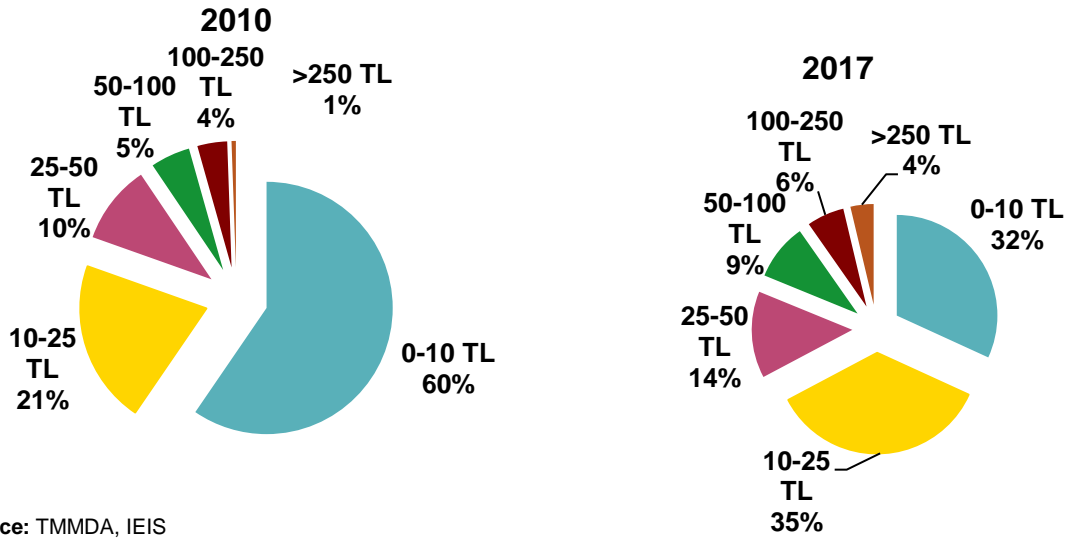
In 2017, import products priced at over TL 100 grew in terms of unit share, whereas other product groups saw a reduction in the same year.

Chart 20- Price Breakdown of Import Products



Among local products, the group with the highest share was the TL 10-25 group with 35%. In 2017, products priced at 25 TL and less accounted for 67% of the local pharmaceuticals market.

Chart 21- Price Breakdown of Local Products

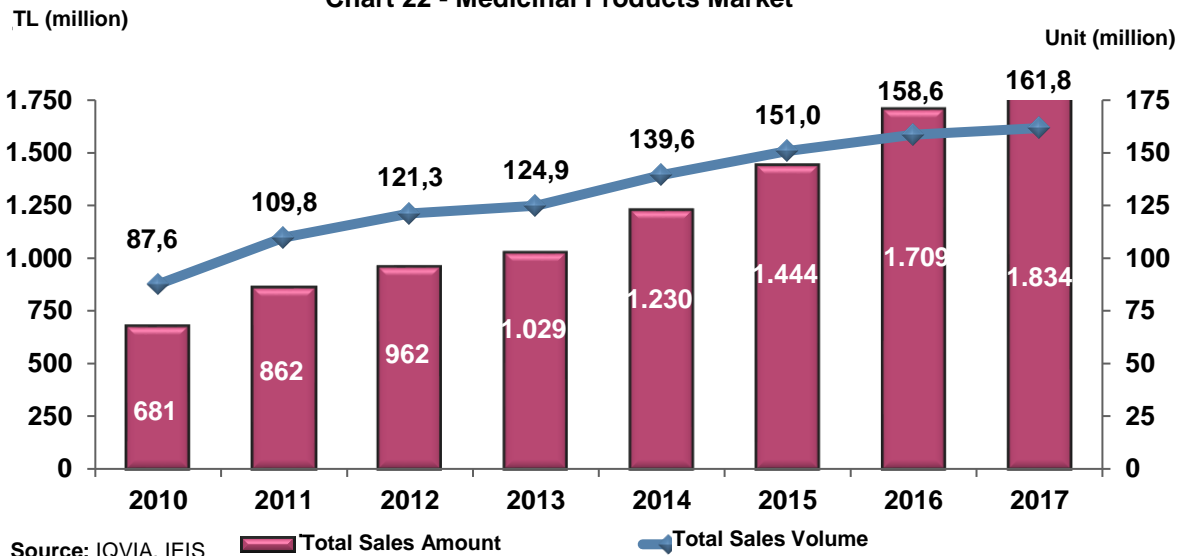


Source: TMMDA, IEIS

2. Medicinal Products Market

Medicinal products that are within the portfolio of pharmaceutical companies, yet that are not classified as pharmaceutical products are as follows: biocidal products licensed by the Ministry of Health, certain medical devices in pharmaceutical form, medical infant formulas, cosmetic and derma-cosmetic products; vitamins authorized by the Ministry of Agriculture and Forestry, food supplements and infant formulas. These products scored 7.3% growth in 2017 and reached a value of TL 1.8 billion. They posted a 2% rise in unit terms with sales of 162 million units.

Chart 22 - Medicinal Products Market



Source: IQVIA, IEIS

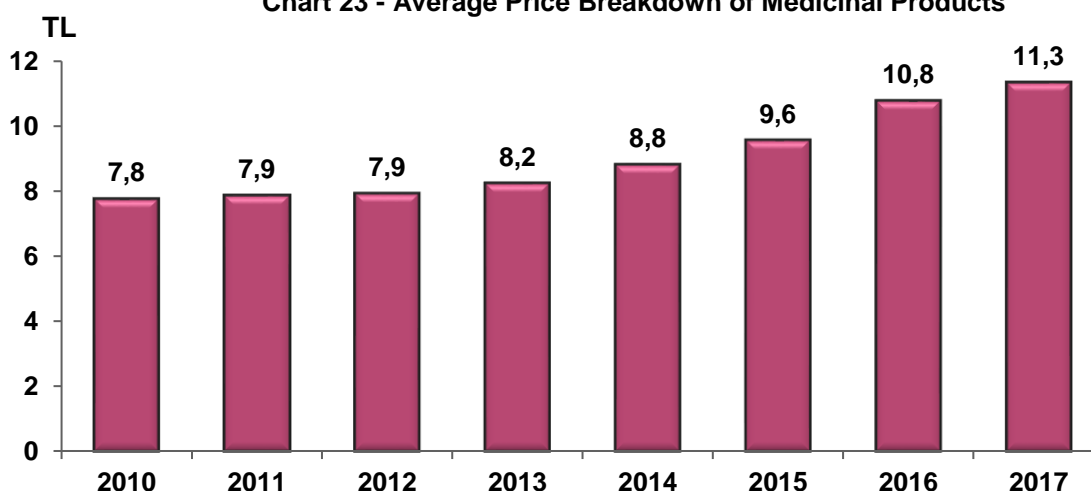
An analysis of the medicinal product subgroups indicates that reimbursed products have gained share over the past eight years.

Table 8 - Breakdown of the Medicinal Products Market

| | 2010 | | 2017 | |
|--|--------------------|---------------|--------------------|---------------|
| | Value (billion TL) | Share | Value (billion TL) | Share |
| Non-pharmaceutical Medical Products | 0.68 | 100.0% | 1.83 | 100.0% |
| Reimbursed | 0.13 | 19.4% | 0.68 | 37.0% |
| Non-reimbursed | 0.55 | 80.6% | 1.16 | 63.0% |

Source: IQVIA, IEIS

Over the past eight years, medicinal products' average price has risen by 46% from TL 7.8 in 2010 to TL 11.3 in 2017.

Chart 23 - Average Price Breakdown of Medicinal Products

Source: IQVIA, IEIS

3. Investment Incentives

Put into effect in 2009, Resolution no. 2009/15199 of the Council of Ministers brought about massive positive changes regarding investment incentives, which had been practiced differently by various public institutions. The resolution ensured that these incentives were to be coordinated and managed single-handedly by the Ministry of Trade. Following this resolution, aside from general and regional incentives, investments totaling more than TL 20 million in biotechnological, oncological and blood products were included within the scope of priority investments.

Later in 2015, the Council of Minister Resolution no. 2012/3305 was put into effect, and pharmaceutical investments were offered 5th Region incentives, being classified as advanced technology.

These regulatory developments enabled increase investment in the pharmaceutical industry, while a decline was observed in 2015 and 2016 reflecting the impact of economic conditions.

Council of Ministers Resolution No. 2017/9917, put into effect in February 2017 to boost investments, and therefore production, increased the tax relief and VAT exemption rates for any expenditure made within the scope of the 2017 investment

incentive certificate. This opportunity expedited pharmaceutical investments, as a result of which fixed investments and employment soared by 633% and 284%, respectively, compared to 2016.

Table 9- Investment Incentives in the Pharmaceutical Industry

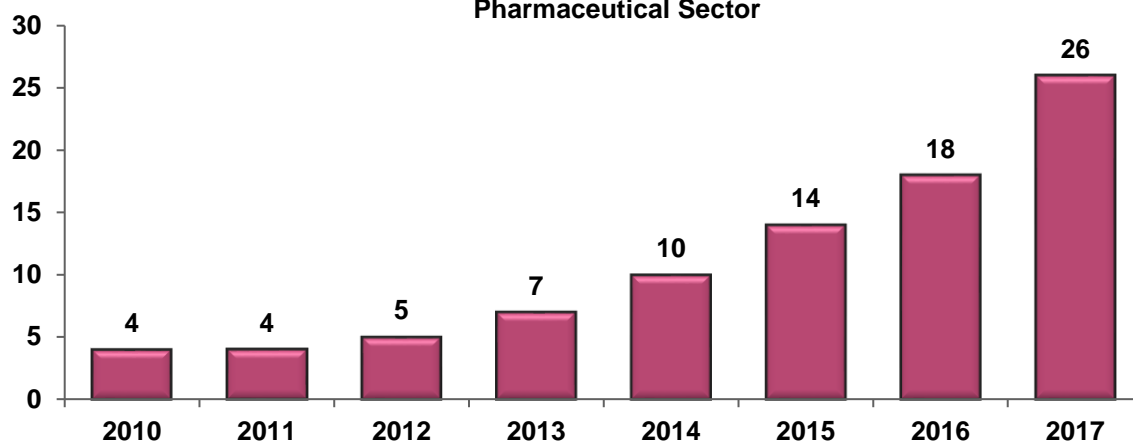
| | No. of Documents | | Fixed Investments (million TL) | | | Employment via Investment | | |
|------|------------------|-------|--------------------------------|---------|-------|---------------------------|---------|-------|
| | Drug | Total | Drug | Total | Share | Drug | Total | Share |
| 2010 | 14 | 3,581 | 272 | 67,439 | 0.40% | 634 | 132,739 | 0.48% |
| 2011 | 17 | 3,979 | 237 | 49,481 | 0.48% | 600 | 119,903 | 0.50% |
| 2012 | 20 | 4,025 | 672 | 61,794 | 1.09% | 725 | 148,428 | 0.49% |
| 2013 | 21 | 4,667 | 512 | 95,191 | 0.54% | 672 | 189,260 | 0.36% |
| 2014 | 17 | 3,959 | 1,707 | 64,503 | 2.65% | 885 | 143,305 | 0.62% |
| 2015 | 24 | 4,552 | 879 | 99,074 | 0.89% | 956 | 141,771 | 0.67% |
| 2016 | 15 | 5,161 | 327 | 97,780 | 0.33% | 551 | 141,356 | 0.39% |
| 2017 | 33 | 7,450 | 2,398 | 179,189 | 1.34% | 2,117 | 226,501 | 0.93% |

Source: Ministry of Trade, IEIS

4. R&D

The pharmaceutical industry stands as a high-priority sector contributing to Turkey's industrial transformation with 30 accredited R&D centers and 1,316 R&D employees as of July 2018. Progress in R&D will make it possible to locally manufacture those products for which we are currently dependent on imports.

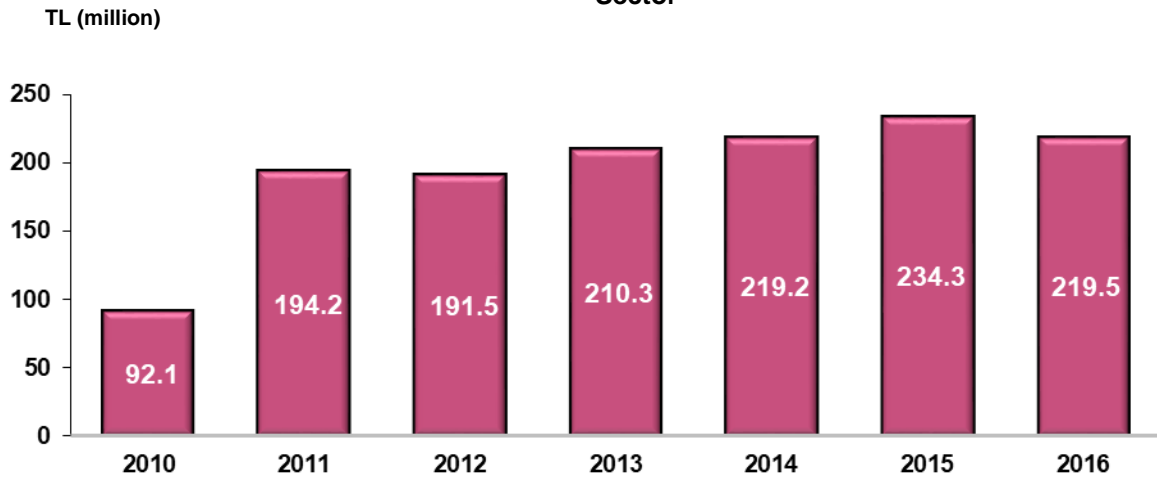
Chart 24 - Number of Accredited R&D Centers in the Pharmaceutical Sector



Source: STB, IEIS

From 2010 to 2016, pharmaceutical R&D spending climbed from TL 92.1 million to TL 219 million on a 138% rise. This increase points to 55% real growth on a manufacturer price basis, and 16% CAGR.

Chart 25 - R&D Spending in the Pharmaceutical Sector



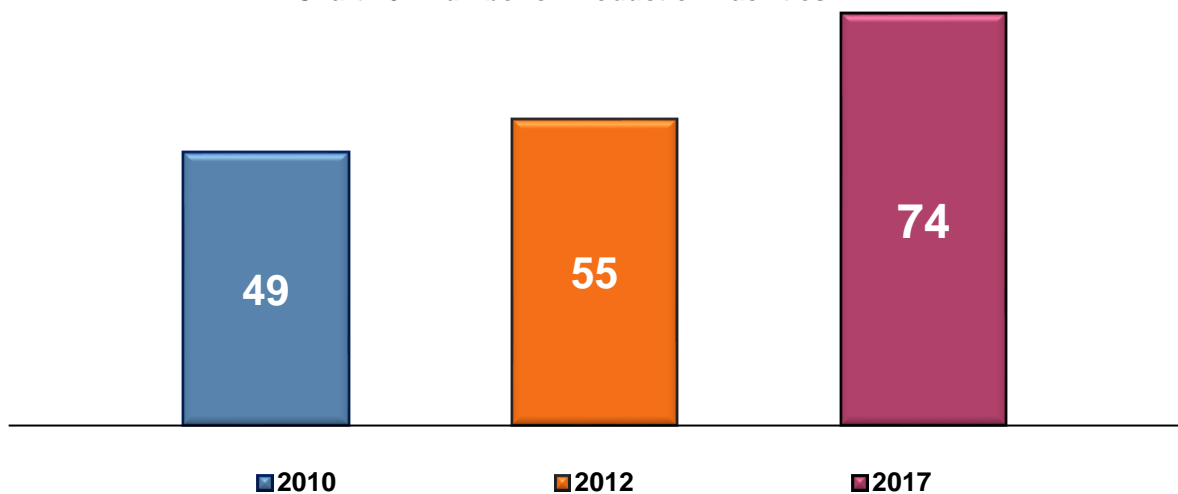
Source: Turkish Statistical Institute, IEIS

5. Production

Turkey boasts a well-established pharmaceutical industry with advanced production technology and capacity. As of June 2018, around 35 thousand employees produce over 11 thousand products, manufactured at 75 world-class production facilities, for the benefit of Turkey's growing and aging population.

A key step in domestic production concerns policies for the localization of production. Related efforts will consider the pharmaceutical industry's production technologies and capacity, whereby ultimately the import products of today will be manufactured locally. In the meantime, the industry invests in new technologies and expands its capacity and employment. This will inevitably reduce imports. Improvement to foreign trade will not end there. As a result of production contracts with global firms including the exports of said products, export figures will rise.

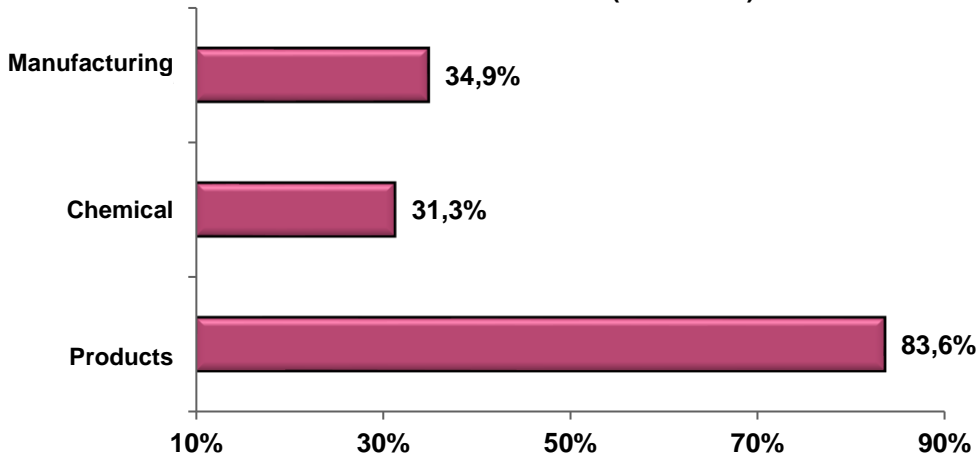
Chart 26 - Number of Production Facilities



Source: TMMDA, IEIS

The industrial production index data for the 2010-2017 period reveals 34.9%, 31.3%, and 83.6% production growth in the manufacturing industry, mid technology chemical industry and pharmaceutical industry, respectively.

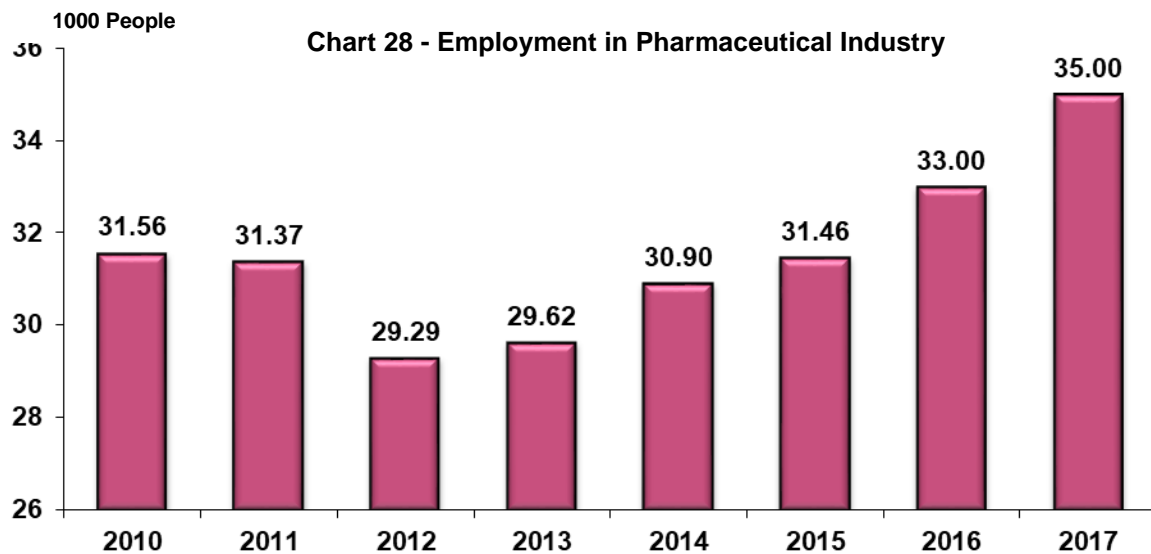
Chart 27 - Industrial Production Index Change (2010-2017)



Source: Turkish Statistical Institute, IEIS

6. Employment

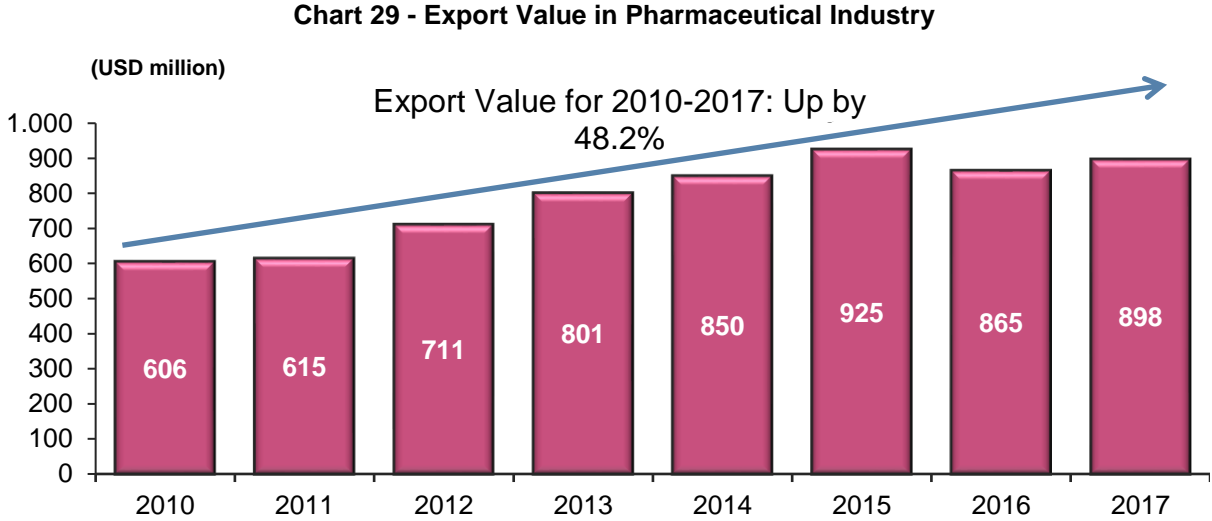
In 2017, the Turkish pharmaceutical sector employed an approximate 35 thousand people. The chart below provides a summary of how employment in the pharmaceutical sector has changed over the years. The price-focused policies implemented during the global budget period had an inevitable impact on the employment data of the sector. As a matter of fact, the total number of people employed in it has eroded significantly since 2010. Only in 2015, could the sector recover to the human resources levels of 2010. The recovery trend between 2015 and 2017 has barely brought the sectoral employment level above 2010 figures. Replacing fiscal discipline-driven policies with compensatory policies will empower the pharmaceutical industry to create additional jobs.



Source: Turkish Statistical Institute, IEIS

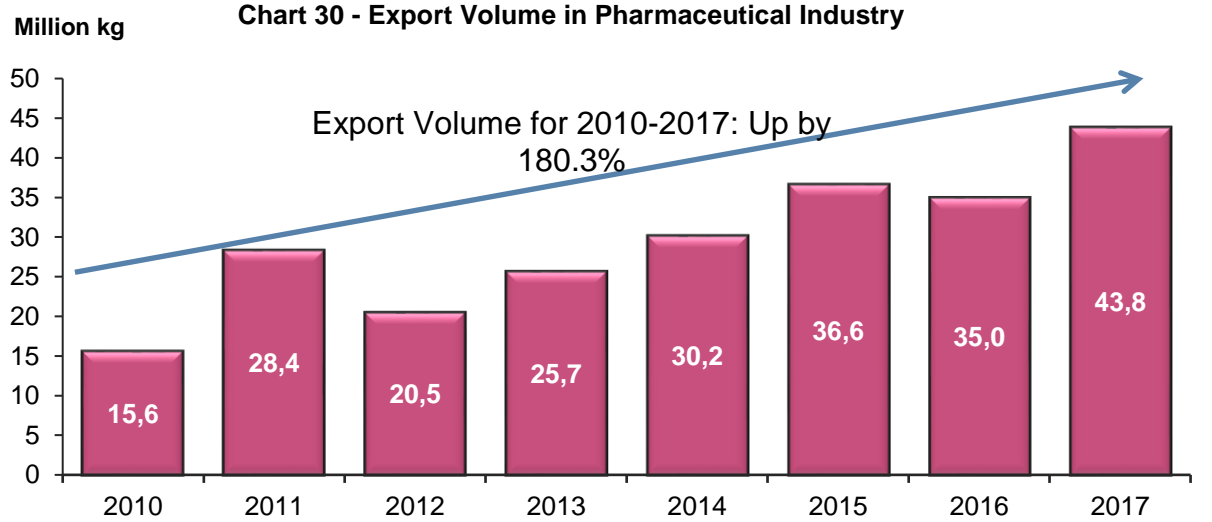
7. Foreign Trade

Pharmaceutical exports, at USD 606 million in 2010, surged by 48.2% to hit USD 898 million in 2017. The 6.4% shrinkage in exports in 2016 was partially recovered with year-over-year growth of 3.7% in 2017.



Source: Turkish Statistical Institute, IEIS

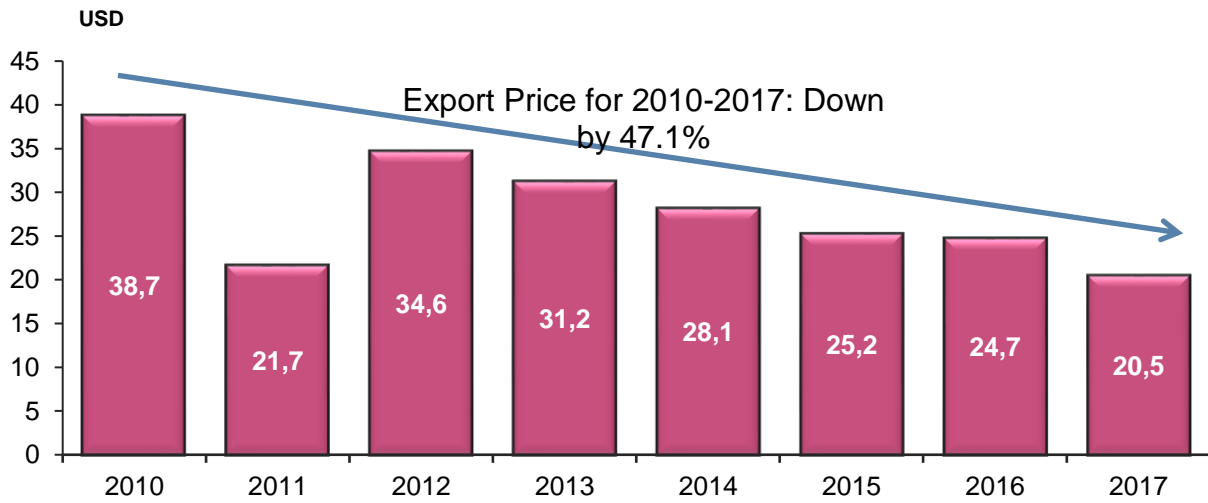
Pharmaceutical export figures between 2010 and 2017 indicate a 180% increase from 15.6 million kg in 2010 to 43.8 million kg in 2017. The quantity-wise (kg) growth is, however, paired with a gradually descending unit price, which translates into a greatly underperforming export value.



Source: Turkish Statistical Institute, IEIS

In fact, from 2010 to 2017, the export value of the industry decreased by 47.1% per kilogram, from USD 38.7 to USD 20.5.

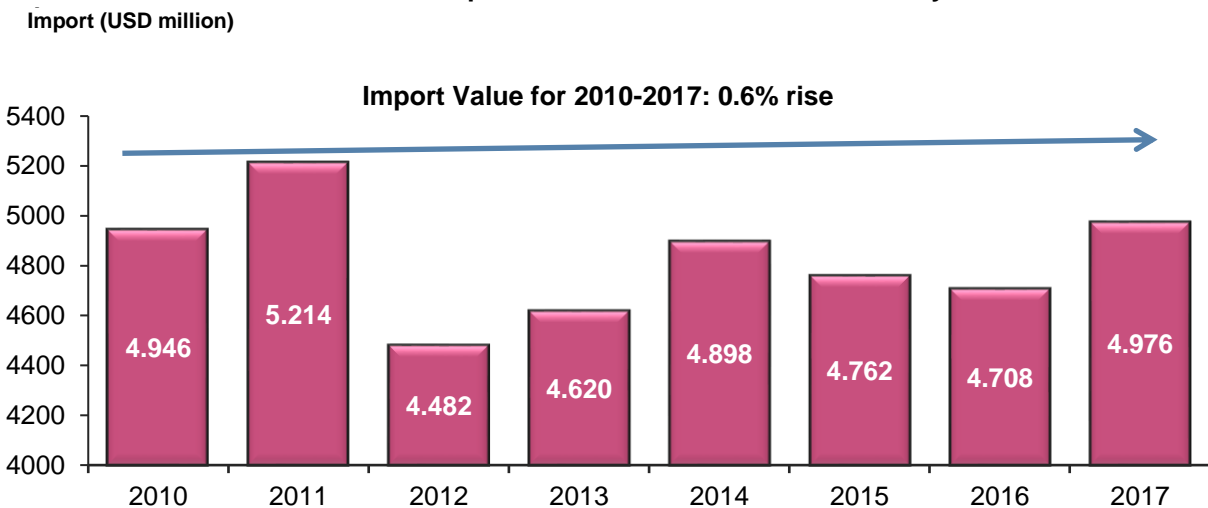
Chart 31 - Export Price in Pharmaceutical Industry



Source: Turkish Statistical Institute, IEIS

In the same period, medicine imports rose by 0.6% to hit USD 4.98 billion.

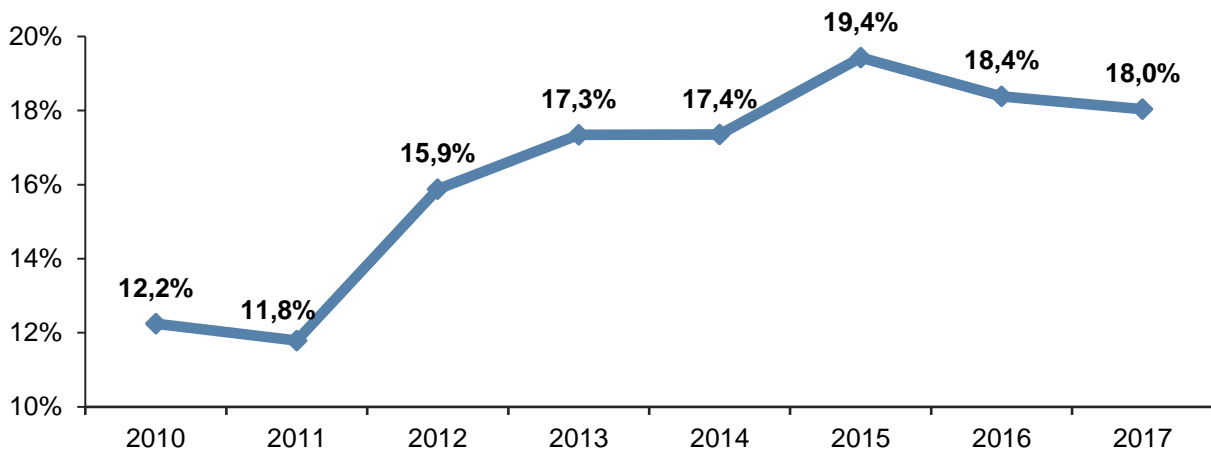
Chart 32 - Import Value in Pharmaceutical Industry



Source: Turkish Statistical Institute, IEIS

Amid these developments, the rate of exports meeting imports was at 18%.

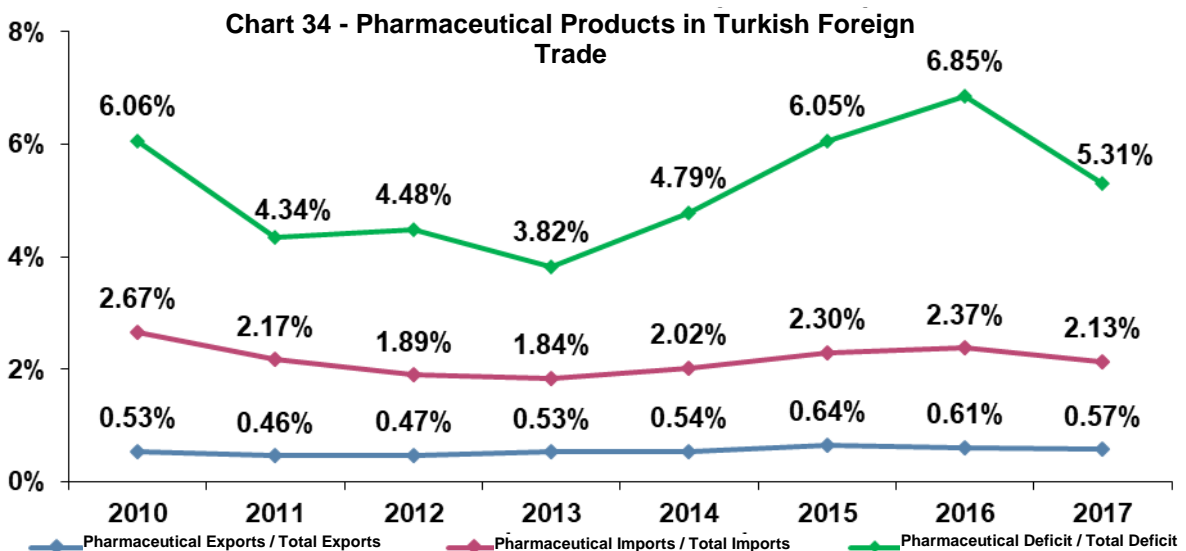
Chart 33 - Rate of Exports Meeting Imports in Pharmaceutical Industry



Source: Turkish Statistical Institute, IEIS ◆ Export / Import

An analysis of export markets indicates that in 2010, exports reached a total of 137 countries, with a further 32 being added to the list over the past eight years. Considering the seven countries where exports were terminated, in 2017, exports were made to 162 countries, mainly the Commonwealth of Independent States (CIS), North Africa and the Middle East. Additionally, in 2017, the sector imported from 84 countries.

An analysis of the pharmaceutical industry's share of Turkey's foreign trade indicates 2.13% of Turkey's total imports for 2017, and a 5.31% share within the pharmaceutical foreign trade deficit.

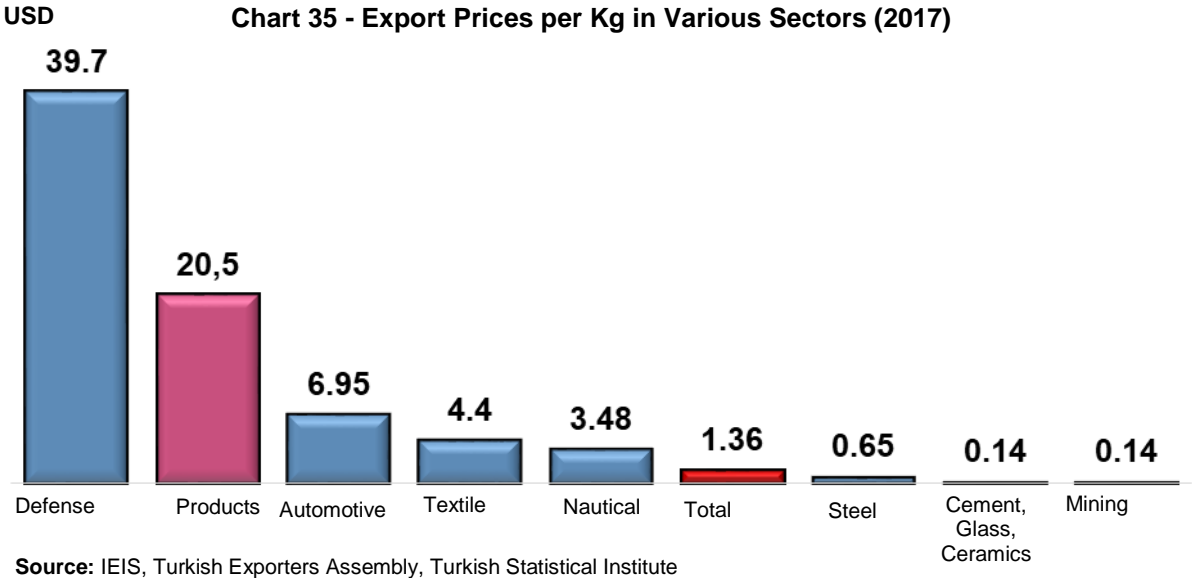


Source: Turkish Statistical Institute, IEIS

Our industry primarily aims to become one of world's prominent pharmaceutical manufacturers and exporters. Yet there are certain obstacles to overcome that currently prevent us from attaining these goals.

The first of these obstacles is that our pharmaceutical prices are taken as a source price in destination countries, resulting in the low penetration of those markets by our companies. Over the years this has led to a decrease in the export value per kilogram.

Nonetheless, the export value per kilogram still by far outgrows the average Turkish market and other sectors.



The second challenge for our exports is presented by licensing and customs clearance processes. Support from the ministries of trade, foreign affairs and health is instrumental in overcoming such problems. Target market authorities' recognition of the GMP certificates issued by TMMDA is a key booster of pharmaceutical exports.

Accordingly, Turkey's membership to PIC/S (Pharmaceutical Inspection Co-operation Scheme), which features members such as the U.S., Germany, Australia, Switzerland, Japan and Canada; as of January 1st, 2018 is a major development in regard to sectoral targets such as widening the global impact area and becoming a net exporter.

Yet another problem to overcome in the promotion of our pharmaceutical exports is that pharmaceutical products manufactured for the domestic market are exported to foreign markets via warehouses without the knowledge of the pharmaceutical companies themselves.

As readers will be well aware, the products of pharmaceutical companies become licensed in export markets only after two years of hard effort, and at great expense. Moreover, their products are then priced as high as possible. These companies also invest heavily in the promotional activities targeted at healthcare professionals to ensure that their products are prescribed.

Pharmaceutical warehouses are exporters, as well. Warehouses that engage in exports contribute to increasing our export volume and launching our products in several foreign markets.

Some warehouses, however, purchase pharmaceutical exporters' products in the Turkish market and sell them at lower prices than the exporter's as these warehouses have no licensing or promotional costs. This burdens the pharmaceutical company that invests in the foreign market, both vis-à-vis the healthcare authorities and business partners in that particular foreign market. The pharmaceutical company is then faced with only two options: reducing product prices or else exiting the market. These developments both harm our country's export performance and discourage pharmaceutical companies from exporting.

An analysis of the pharmaceutical product exports and imports by country shows that Turkey exports to South Korea, Iraq, and Switzerland the most.

Table 10 - Exports per Country (USD million)

| Country | 2016 | 2017 | Change (%) |
|-------------|------|------|------------|
| South Korea | 165 | 136 | -17.2% |
| Iraq | 46 | 61 | 34.4% |
| Switzerland | 60 | 55 | -7.3% |
| TRNC | 29 | 30 | 1.9% |
| Slovenia | 29 | 30 | 1.6% |
| Azerbaijan | 22 | 26 | 18.0% |
| Iran | 26 | 25 | -2.3% |
| USA | 39 | 22 | -42.7% |
| Libya | 26 | 22 | -16.4% |
| Poland | 18 | 20 | 11.1% |

Source: Turkish Statistical Institute, IEIS

The most important import markets, on the other hand, are Germany, USA, Switzerland, Ireland and England.

Table 11 - Imports per Country (USD million)

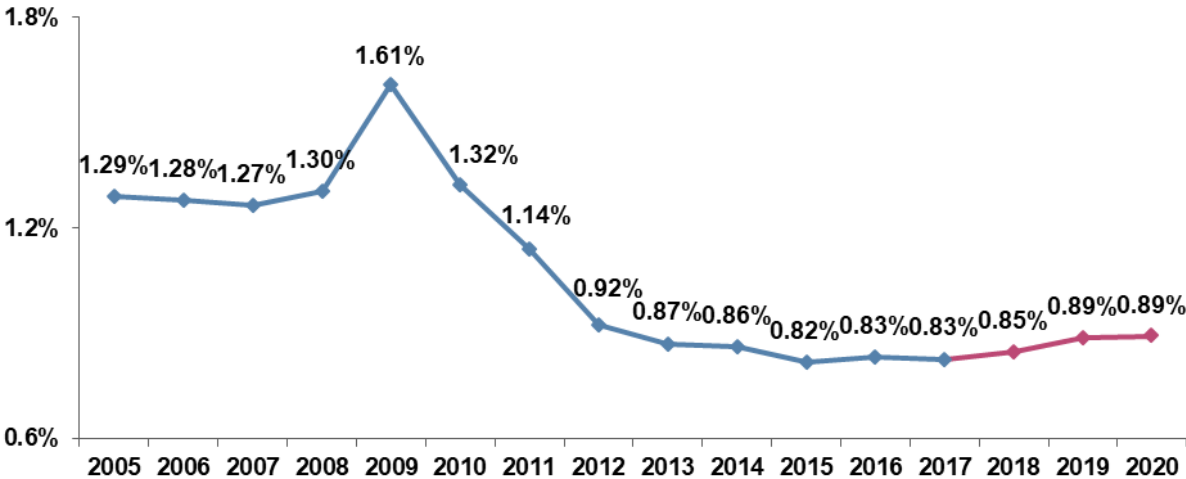
| Country | 2016 | 2017 | Change (%) |
|-------------|------|------|------------|
| Germany | 853 | 828 | -3.0% |
| USA | 584 | 600 | 2.7% |
| Switzerland | 379 | 417 | 10.2% |
| Ireland | 282 | 410 | 45.5% |
| England | 317 | 375 | 18.3% |
| Italy | 321 | 346 | 7.5% |
| France | 368 | 339 | -8.0% |
| China | 200 | 208 | 4.1% |
| South Korea | 218 | 182 | -16.5% |
| India | 173 | 170 | -2.0% |

Source: Turkish Statistical Institute, IEIS

8. Pricing Policies

The global financial crisis which broke out in 2008 and gradually intensified, affected our economy deeply. In the aftermath of the crisis, radical arrangements were introduced in 2009 to overcome the challenges posed by public finance. A global budget was one of the newly-adopted practices. As part of the Healthcare Transformation Program, service quality and access to healthcare were improved, yet the means of mitigating rising expenses were measures regarding the prices of medicines. Product budgets were not proportional to the level of services offered. Furthermore, prices were constantly reduced based on the rationale that the product budget was exceeded, while the Social Security Institution discount rates were increased. The below chart presents yearly public pharmaceutical spending as a percentage of GDP.

Chart 36 - Pharmaceutical Spending as a Percentage of GDP

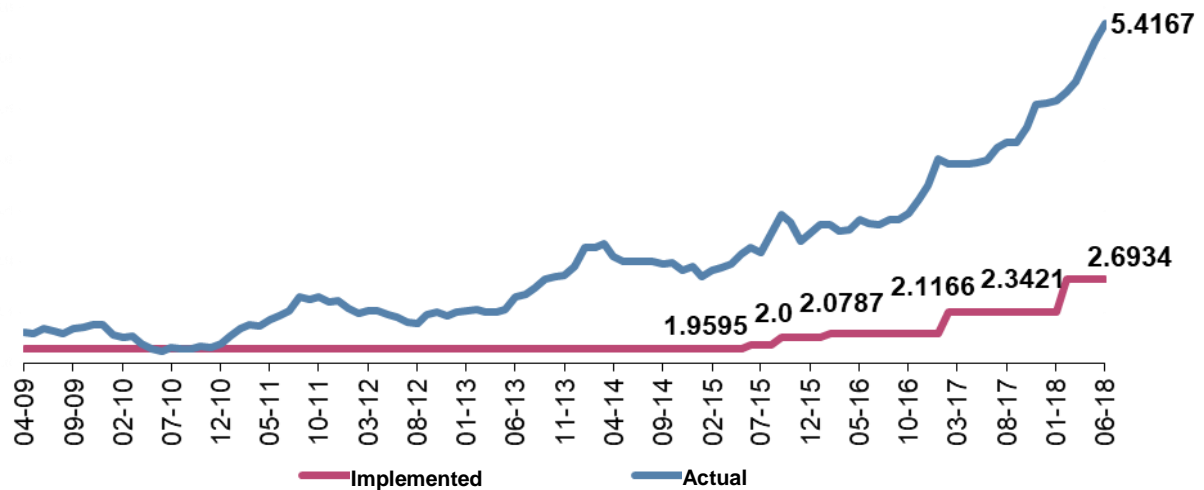


Source: General Directorate of Budget and Fiscal Control, IEIS

Additionally, although the conditions sought in the legislation were fulfilled, the Euro value used for TL conversion of the EU-based product prices was not updated from April 2009 to May 2015. Prices were fixed at TL 1.9595 so as to control the pharmaceutical expenses. Legal proceedings initiated by the industry regarding an update of the exchange rate were finalized in favor of the pharmaceutical sector in April 2015. The conversion rate, initially announced as 2 TL, was subject to objection from the industry, and subsequently set at 70% of the Euro average of the previous year. This value was updated to TL 2.3421 for 2017. In 2018, a provisional decision that overruled the regulation was carried into effect, and the increase was changed to 15% instead of 23%. The conversion rate was then set as TL 2.6934. The current pharmaceutical rate remains more than 50 percent below the current conversion rate.

A Euro regulation that imposes 70% of the previous year’s Euro rate on the industry remains far removed from economic realities. Within that context, the previous year’s average should be considered in full, instead of at 70%.

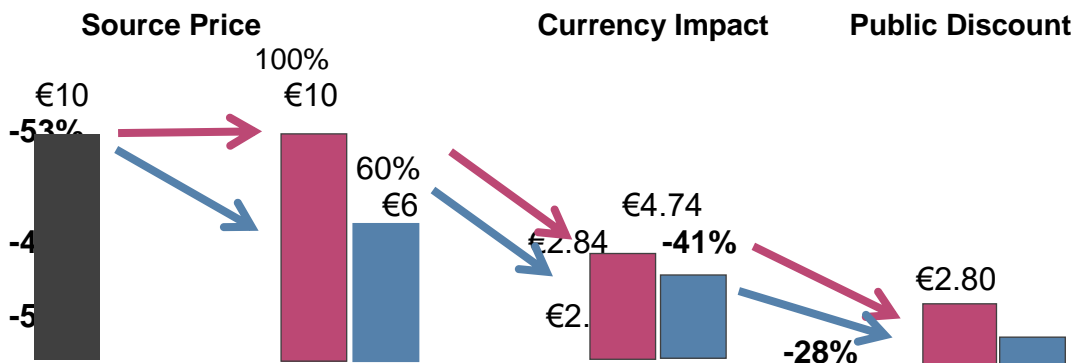
Chart 37 - Currency Trends (Euro/TL)



Source: Central Bank of the Republic of Turkey, IEIS

The chart below depicts how a product, whose source price is 10 euros, is priced in Turkey. In Turkey, the originator product is priced at EUR 2.85 and the generics at EUR 2.09.

Chart 38 - Medicine Pricing



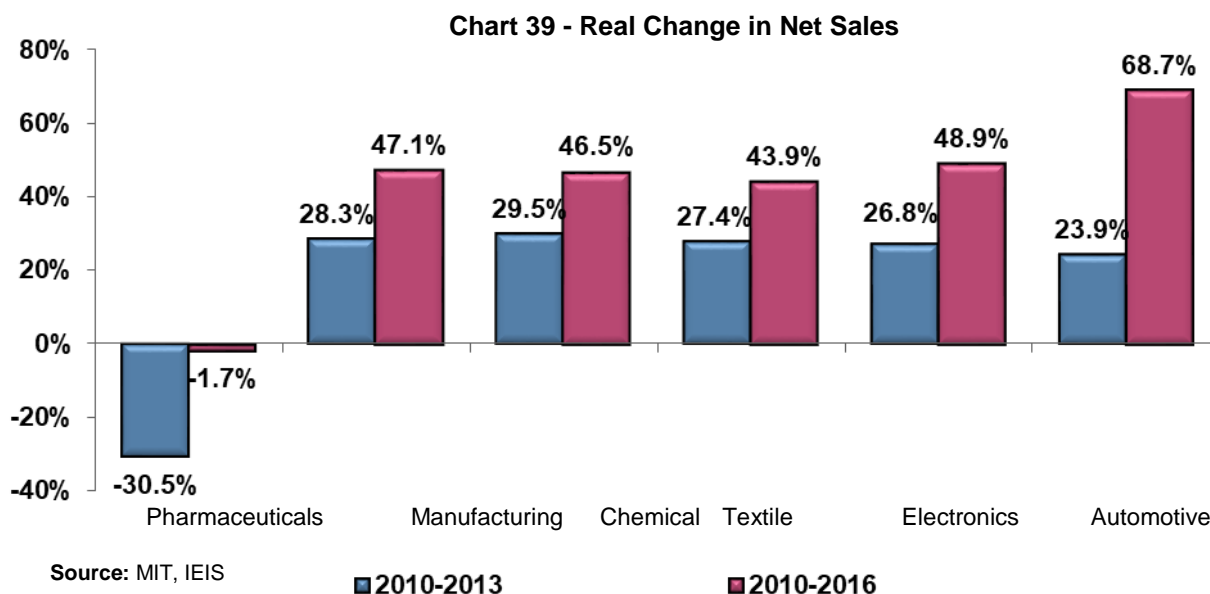
Current exchange rate as of July 17, 2018: 1 € = TL 5.6816

Source: Central Bank of the Republic of Turkey, IEIS

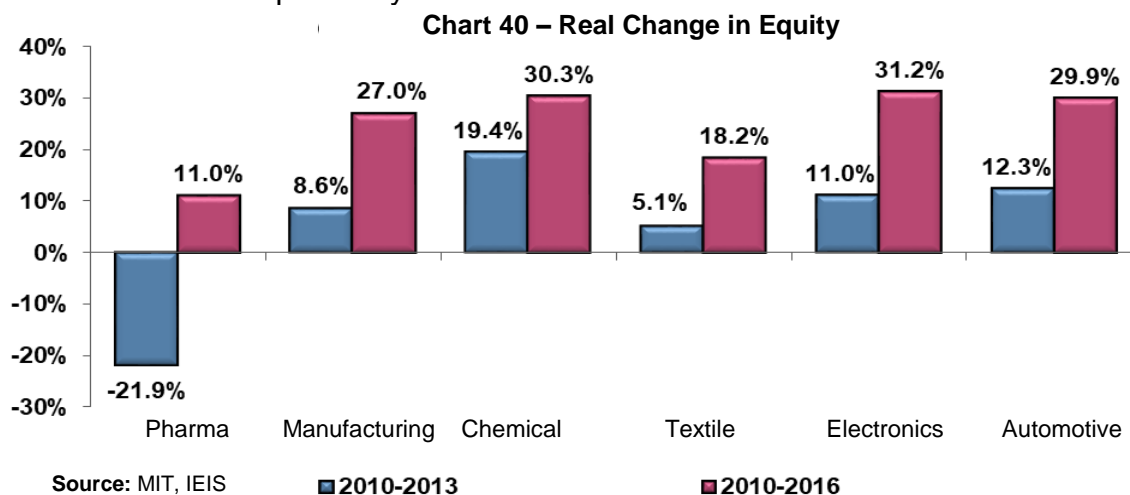
Reference
Generics

Price-oriented policies have an inevitable negative impact on the pharmaceutical industry's financial data and the country's performance in meeting economic goals.

Compared to other sectors' figures, the pharmaceutical industry's financial data points much more clearly to a recession. In fact, current pricing policies have caused a real recession in pharmaceutical net sales between 2010 and 2016, a period marked by significant real growth for other manufacturing industries such as chemicals, textiles, electronics and automotive.



Real net sales recession due to pricing policies has inevitably had a negative impact on the pharmaceutical sector's capability of generating equity. Although the sector saw its equity rise to some extent thanks to tight cost management, this upward movement was outpaced by other sectors.



9. Conclusion and Evaluation

With its well-established and experienced companies, continuously rising R&D spending, high production capacity, contribution to qualified labor and growing export volume, the Turkish pharmaceutical industry serves as an essential sector for the country, both for the successful progress of healthcare and the fulfillment of its economic objectives.

The pharmaceutical industry is marked by advanced technology and constant innovation, and needs to keep pace with rapid scientific and technological advances and change.

Under these circumstances, safeguarding the competitiveness of this industry requires companies to channel their profit back into the industry, and to sustain their

appetite for investment. Unfortunately, the price and cost-oriented public policies in effect over the past eight years have hindered the sector's efforts towards becoming a global actor.

With pricing policies based on fiscal discipline, the sector invests less than necessary and allocates less than the required amount in the manufacturing of higher value-added products, remaining dependent on imports and exporting below its potential.

Against this challenging backdrop, pharma companies continue their best efforts, focusing mainly on the development of value-added generics, combined products and biosimilars. In addition to the conventional domain, pharmaceutical companies also strive to develop our industry in biotechnology, a strategically relevant area. Managing to develop and produce biotechnological products at home will add to our knowledge and technological know-how, reduce the country's current deficit and give our country a competitive edge.

In sum, the right public policies will give leverage to the sector, ensuring that it completes its industrial transformation, gears up in investments, gains R&D competency, advances in biotechnology, produces medicines of higher added value and contributes to employment and the broader Turkish economy. The sector will ultimately become a net exporter as well as a global actor.



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