The Outlook on Higher Education in Turkey

2017

MONITORING AND EVALUATION REPORT

THE OUTLOOK ON HIGHER EDUCATION IN TURKEY 2017

MONITORING AND EVALUATION REPORT

Eğitim-Bir-Sen Publications: 82

Owner in the name of Eğitim-Bir-Sen
Ali YALÇIN / General President

Managing Editor
Şükrü KOLUKISA / Vice President

Research Coordinator
Atilla Olçum / Vice President

Editorial Board
Ali Yalçın
Latif Selvi
Ramazan Çakırcı
Mithat Sevin
Şükrü Kolukısa
Hasan Yalçın Yayla
Atilla Olçum

design & layout. Ümare Altun
copy editor. Alizee Zapparoli Mansoni Bodson
printing. Semih Ofset. 0312 341 40 75
printed. 750 copies
printing date. 1st edition. April 2018
ISBN. 978-975-6153-76-5

Eğitim-Bir-Sen General Center
Oğuzlar Neighbourhood Av. Özdemir Özok Street No:5 Balgat/ANKARA, TURKEY
Phone: +90 312 231 23 06 - Gsm: +90 533 741 40 26 - Fax: +90 312 230 65 28
www.ebs.org.tr - facebook.com/egitimbirsen - twitter.com/egitimbirsen

Please site this publication as:
Gür, B.S., Çelik, Z., Kurt, T. ve Yurdakul, S. (2018). *The outlook on higher education in Turkey 2017: Monitoring and evaluation report*. Ankara: Eğitim-Bir-Sen Center for Strategic Research.

THE OUTLOOK ON HIGHER EDUCATION IN TURKEY 2017

MONITORING AND EVALUATION REPORT

Bekir S. Gür
Zafer Çelik
Türker Kurt
Serkan Yurdakul

PREFACE

Demand for higher education has been increasing around the world due to its contributions to the economic, social and cultural life of individuals as well as its contributions to the social and economic development of countries. This increasing demand is exerting immense pressure on the existing higher education systems and it is forcing these educations systems to grow. Following World War II, higher education systems rapidly ceased to be an elite service and have been popularized, expanded and diversified especially in the U.S and Western Europe. Popularization has generally occurred in later periods in developing countries. The higher education system in Turkey has grown very rapidly in recent years and as of the 2016-2017 academic year the total number of students in the higher education system has reached a total of 7 million. Accordingly, **Turkey now has the largest higher education system in Europe.** Therefore, determining the degree of success of the investments made in the higher education sector in recent years and monitoring the efficiency and efficacy of the growth of the higher education system is a necessity. In order to do this, the higher education system needs to be monitored with up to date data, and the progress towards established goals should be assessed.

As Eğitim-Bir-Sen, mindful of being the largest education union and civil society organization in Turkey, we have shouldered the responsibility of this very important study. In 2016, we first conducted a comprehensive analysis of the K-12 education system with the *Outlook on Education of Turkey 2016: Monitoring and Evaluation Report*. Furthermore, we decided to continue to conduct monitoring and evaluating studies on the national education system on a yearly basis. Now we have set the same goal for the higher education system and for the first time in Turkey we started an annual monitoring and evaluation study on the higher education system.

The *Outlook on Higher Education of Turkey 2017: Monitoring and Evaluation Report*, which was prepared abiding by the principle of data-based analysis and according to the conventions adapted by international institutions such as OECD and UNESCO, is the first step towards achieving the goal outlined above. This report series, conducted on a yearly basis, will be helpful in monitoring the effectiveness and efficiency of the higher education system in Turkey. On the basis of these analyses, another aim is to present the current working conditions of higher education employees.

As Eğitim-Bir-Sen, we wish to contribute to bringing forth the issues and problems of higher education policies and to the formation of a data-driven common language on higher education through this monitoring and evaluation report. I believe that this report will be beneficial for the higher education community and for Turkey as a whole. I also expect that the decision-making processes on higher education be more participatory, responsive to the demands of the public, and data-driven. I would like to take this opportunity to thank our research team, who prepared this report and thank the institutions which responded positively to our requests for data.

Ali Yalçın
President of Eğitim-Bir-Sen and Memur-Sen

FOREWORD

Due to the relationship between a country's economic prosperity and higher education, higher education systems, particularly in developing countries have entered a phase of rapid growth and development. The popularization and universalisation process in Turkey picked up a new pace in the 2006-2008 period with the goal of providing all provinces with at least one university. Higher education is now being provided on a massive scale in all of the provinces in Anatolia. The quantitative growth of the higher education system, particularly in the last 10 years makes monitoring and evaluation studies a necessity in order to analyse the qualitative progress that has been made as well. Analysing and evaluating the data regarding the conditions of the higher education system and its institutions is important in terms of higher education employees performing more effectively.

The *Outlook on Higher Education of Turkey 2017: Monitoring and Evaluation Report*, which was prepared by prominent scholars of higher education studies including Dr. Bekir S. Gür (Associate Professor at Ankara Yıldırım Beyazıt University), Dr. Zafer Çelik (Associate Professor at Ankara Yıldırım Beyazıt University), Dr. Türker Kurt (Associate Professor at Gazi University) and Serkan Yurdakul (Expert statistician working at Eğitim-Bir-Sen). As such, I believe this report is going to make a valuable contribution to corrective actions concerning existing higher education policies, in providing valuable lessons learned in the field of higher education, and that it will become a valuable reference point for decision makers who want to develop new policies.

The *Outlook on Higher Education in Turkey 2017: Monitoring and Evaluation Report* consists of seven chapters which cover indicators concerning the transition to higher education, access and participation in higher education, education outputs, educational environments, the financing of higher education and the performance of universities and academic human resources. Each chapter starts with an "indicators" section which presents the data, figures, tables and maps concerning the topic examined. Following this, there is a section on "Highlights" which encompasses the discussion of various points of emphasis in the data. Furthermore, there is a section of "Recommendations" which contains solutions to the problems discussed in the report and constructive proposals for improving the higher education system.

Data published by international organizations such as UNESCO and OECD and from national organizations such as the Ministry of National Education (MONE), Turkish Statistical Institute (TURKSTAT), the Board of Higher Education (BHE), the Measurement, Selection and Placement Centre (ÖSYM), Loans and Dormitories Agency (LDA), the Scientific and Technological Research Council of Turkey (TÜBİTAK) and Turkish Patent and Trademark Office (TURKPATENT) were used in the preparation of indicators in this report. In addition to this, data which was not available in open resources was requested from MONE, BHE, LDA and Anadolu, Istanbul and Atatürk universities which have open education faculties. To the extent that it was possible, data was examined according to year, gender, region and province, education level and higher education institution type. Moreover, some data was also compared with international data. The tables, figures and maps used in the report were

prepared in accordance with the formats used in international reports on the topic. Murat Öztürk of Ankara Yıldırım Beyazıt University provided valuable insights and guidance in terms of compiling data and informing the analytical framework for this study.

I hope this report, which is the first of its kind to examine the Turkish higher education system within such an extensive framework will contribute to its improvement and development and to the formation of new policies towards solving its problems. The objective of this report is to systematically analyse all available data on higher education, monitor and evaluate implementations, and contribute to the improvement of the higher education system through constructive recommendations. The report will succeed in its goal to the extent that it correctly identifies challenges facing the higher education system and accurately develops new recommendations. I thank the research team who diligently prepared the report and all the stakeholders who contributed to it.

Atilla Olçum
Vice Chairman

Table of Contents

List of Tables, Figures and Maps

List of Acronyms and Abbreviations

AHCI	Arts and Humsnities Citation Index
AK Party	Justice and Development Party
ALES	Academic Personnel and Graduate Education Exam
ARDEB	Directorate of Research Support Programs
BHE	Board of Higher Education
CABİM	Cahit Arf Information Centre
CPI	Consumer Price İndex
EARGED	(Ministry of National Education) Research and Development Unit for Education
G20	Group of 20
GDP	Gross Domestic Product
İBBS1	Nomenclature of territorial units for statistics level
İTÜ	Istanbul Technical University
KPSS	Public Personnel Selection Examination
KTÜ	Karadeniz Technical University
LDA	General Directorate of Loans and Dormitories Agency
LYS	Bachelor Placement Examinations
METU	Middle East Technical University
MONE	Ministry of National Education
MYO	Postsecondary Vocational Schools
OBP	Secondary Education Success Points
OECD	The Organisation for Economic Co-operation and Development
ÖABT	Teaching Field Knowledge Test
ÖSYM	Assessment, Selection and Placement Centre
ÖSYS	Student Selection and Placement System
ÖYP	Faculty Member Training Program
PCT	Patent Cooperation Treaty
R&D	Research & Development
SCI	Science Citation Index
SJR	Scientfic Journal Rankings
SSCI	Social Sciences Citation Index
THE	Times Higher Education
TOBB	The Union of Chambers and Commodity Exchanges of Turkey
TOBB ETÜ	TOBB University of Economics and Technology
TURKSTAT	Statistical Institute of Turkey
TÜBİTAK	Scientific and Technological Research Council of Turkey
TÜRKPATENT	Turkish Patent and Trademark Office

TÜSİAD	Turkish Industry and Business Association
UBYT	International Scientific Publication Incentive Program
ULAKBİM	Turkish Academic Network and Information Center
UNESCO	United Nations Educational, Scientific and Cultural Organization
URAP	University Ranking by Academic Performance
US	United States
WIPO	World Intellectual Property Organization
YGS	Higher Education Examination
YLSY	Selecting and Placing Candidates to be Sent Abroad for Graduate Study

Translation of Turkish Terms

Açıköğretim (lisans):	Open education (bachelor's)
Açıköğretim (önlisans):	Open education (associate's)
Açıköğretim Lisesi:	Open Education High Schools
Açıköğretim	Open Education
Anadolu Lisesi (resmi):	Anatolian High School (official)
Araştırma görevlisi:	Research assistant
Araştırma ve uygulama merkezi:	R&D Centers
Boş kalan kontenjan:	Unfilled quota
Burs:	Scholarship
Çok Programlı Liseler:	Multiprogram High Schools
Devlet:	Public
Doçent:	Associate Professor
Doktora programı:	Doctorate program
Doktora:	Doctoral/PhD
Eğitim ve öğretim alanları:	Fields of education and study
Eğitim-öğretim planlamacısı:	Educational planner
Endüstri Meslek Liseleri:	Industrial Vocational High Schools
Erasmus öğrenci hareketliliği:	Erasmus student mobility
Faculty:	Öğretim üyesi
Farabi öğrenci hareketliliği:	Farabi student mobility
Fen Lisesi:	Science High School
Genel liseler:	General High Schools
Güzel Sanatlar Liseleri:	Fine Arts High Schools
İkinci öğretim:	Evening education
İmam Hatip Lisesi:	İmam Hatip High School
Katkı kredisi:	Contribution loan
Kız meslek Lisesi:	Girls' vocational High School
Kontenjan:	Quota
Lisans:	Bachelor's
Lisansüstü:	Graduate
Lise ve dengi meslek okulu:	Secondary education
Lise (resmi):	High School (official)
Meslek Liseleri:	Vocational High Schools
Mevlana öğrenci değişim programı:	Mevlana student exchange program
MYO:	Postsecondary vocational schools (MYOs)
Öğrenim kredisi:	Student loans

Öğretim elemanı:	Academic staff
Öğretim görevlisi:	Instructor
Öğretim üyesi:	Faculty
Öğretmen Liseleri:	Teacher High Schools
Okutman:	Language instructor
Önlisans:	Associate's
Otelcilik ve Turizm M. Liseleri:	Anatolian hotel management and tourism vocational high school
Özel Fen Lisesi:	Private Science High School
Özel Lise (Yabancı dil):	Private High School (Foreign Language)
Özel Temel Lise:	Private Basic High School
Postsecondary vocational schools:	Meslek Yüksek Okulu (MYO)
Profesör:	Professor
Sağlık Meslek Liseleri:	Vocational High Schools of Health
Sanatta yeterlilik programı:	Proficiency in art program
Sosyal Bilimler Lisesi:	Social Science High School
Spor Lisesi:	Sports High School
Teknik Liseler:	Technical High Schools
Ticaret Meslek Liseleri:	Trade Vocational High Schools
Uzaktan eğitim:	Distance education
Uzman:	Specialist
Vakıf MYO:	Foundation MYO
Vakıf:	Foundation
Yardımcı Doçent:	Assistant professor
Yıllık beslenme yardımı:	Annual nutrition aid
Yıllık TÜFE:	Annual CPI
Yüksek Lisans:	Master's
Yükseköğretim yatırım ödeneği:	Higher education investment fund (million TL)
Yüzyüze öğretim:	Face to face instruction

INTRODUCTION

Higher education provides considerable individual and social benefits (OECD, 2017). For instance, higher education graduates earn a higher income compared to lower level graduates and accordingly they pay more taxes. Considering this, the matter of who benefits from higher education is an important topic of discussion. As is the case in most countries, there is also a high demand for higher education in Turkey and the number of students receiving higher education continues to increase every year. According to current trends, the demand for higher education is going to increase since the number of high school graduates is also on the rise. Moreover, the higher education systems of countries play an increasingly important role in a globalized economy. As the higher education sector in Turkey rapidly expands, the importance of monitoring the indicators of higher education and comparing them with other countries as well as monitoring growth over the years becomes more important. These studies have a significant potential to contribute to the healthy growth of the higher education system and to enable it to achieve its goals more effectively and efficiently. Furthermore, these monitoring studies serve an important function in providing decision makers, journalists, and general audiences with annual performance reviews which compare the Turkish higher education system with other countries.

Objective and Scope

The objective of this report is to present the current condition of Turkey's higher education system based on data collection and by taking into account historical trends and making international comparisons. The specific objective of the report is to monitor and evaluate the indicators regarding Turkish higher education on a yearly basis. The report consists of seven chapters: transition to higher education; access and participation in higher education; outputs of education; academic staff; educational environments; the financing of higher education and the performance of academic human resources and universities. Each chapter contains different indicators which are supported by tables, figures and maps based on the related data. The main criterion used in the selection process of data and the related indicators were based on the potential to contribute to the development of higher education policies in Turkey. In this context, the international monitoring and evaluation reports and the data sources in Turkey were systematically scanned (see **Primary Data Sources**) and indicators which could be used by researchers and decision makers were subsequently produced.

Method

This report was prepared in a similar way to the *Outlook on Education 2016: Monitoring and Evaluation Report* using descriptive research which is one of the quantitative research methodologies. Since the study examines trends from the past up to the present it has the quality of being both cross-sectional and longitudinal. Descriptive tables were used alongside figures and maps in the data analysis. Among the most prominently employed statistical techniques are ratio and proportional statistics, frequency distributions, percentage distributions, percentage change statistics,

central tendency measurements and cross table analyses for inter category comparison. The data analysis took place in two stages. In the first stage, the appropriate indicators relevant to higher education were selected and the types of data that would be collected were determined based on these indicators. Following this, the relevant data was compiled and when possible the previous years were also included to gain a better to understanding historical trends. Data was also requested from relevant institutions and organizations. During this process data from numerous sources, institutions, and organizations was compiled and prepared for analysis. The research team verified the data and analysis in order to prevent material errors during the data compilation and the preparation of the data for analysis. The data that presented as inconsistent during the analysis/interpretation phase was identified and re-evaluated by the research team. Again, the internal consistency of the text was checked numerous times during the final reading and revision process by comparing the figures/table/maps with the main text.

Primary Data Sources

The data used in this report was obtained from a diverse set of sources. The primary sources regarding national indicators were the Higher Education Information Management System on the BHE website and the Higher Education Statistics Book which was published annually during the 1997-2012 period and can be found in the periodicals section of the ÖSYM website. The higher education data for the 2013-2016 period was obtained from the BHE's Higher Education Information Management System. Furthermore, an effort was made to obtain all data available from the Information Management System relating to previous years. The data from the National Education Statistics which is published annually by the Ministry of National Education (MONE, 2017) and the data in the ***Outlook on Education 2016: Monitoring and Evaluation Report***, published by Eğitim-Bir-Sen (2016) were updated and were employed to inform the indicators regarding the financing of higher education. In addition, data was also obtained from the General Directorate of Loans and Dormitories Agency (LDA) of the Ministry of Youth and Sports, the Ministry of Finance and the Scientific and Technological Research Council of Turkey (TÜBİTAK). Labour force and earnings statistics, education expenditure statistics, education statistics according to age groups and provinces, and research-development activity statistics were obtained from the relevant publications of the Statistical Institute of Turkey (TURKSTAT).

As it can be seen in the report, data for some of the indicators dates back to the 1997-1998 academic year. The reason for this is that data from prior to 1997 could not be obtained from ÖSYM. The quantitative data for the exams conducted by ÖSYM such as YGS, LYS, ALES, KPSS, ÖABT was obtained from the ÖSYM website. However, since the number of candidates who took the KPSS general ability, general culture and educational science tests were not available on ÖSYM's website they could not be included in the figures. The missing data was requested from ÖSYM but could not be obtained. The data for the second university without an examination system was provided by Anadolu, İstanbul and Atatürk universities which provide open education services in Turkey.

The primary sources consulted for international comparison were the ***Education at a Glance*** report, published annually by the Organization for Economic Co-operation and Development (OECD,

2016) and the Institute for Statistics hosted by the United Nations Education, Science and Culture Organization's website (UNESCO, 2017). Among the sources employed in the discussion of the performance of academic human resources and the universities are the entrepreneurial and innovative university index statistics of TÜBİTAK, the patent application statistics of the Turkish Patent and Trademark Office (TURKPATENT), patent statistics from the World Intellectual Property Organization (WIPO), scientific publications statistics from SCIMAGO and ULAKBİM. Furthermore, the data from world and Asia rankings of Times Higher Education (THE), the world and Turkish university rankings of METU's Informatics Institute (URAP) Laboratory, world university rankings from GreenMetric and Webometric were used.

References

Eğitim-Bir-Sen. (2016). ***Eğitime bakış 2016: İzleme ve değerlendirme raporu*** [Outlook on education 2016: Monitoring and evaluation report]. Ankara: Eğitimciler Birliği Sendikası.

MEB. (2017). ***Milli eğitim istatistikleri: Örgün eğitim*** 2016-2017 [National education statistics: Formal education 2016-2017]. Ankara: Milli Eğitim Bakanlığı.

OECD. (2016). ***Education at a glance 2016: OECD indicators***. Paris: Organisation for Economic Co-operation and Development.

OECD. (2017). ***The state of higher education 2015-16***. Paris: Organisation for Economic Co-operation and Development.

UNESCO. (2017). UNESCO Institute for Statistics. http://uis.unesco.org/

EXECUTIVE SUMMARY

CHAPTER A: Transition to Higher Education

Various factors including the increase in the compulsory education period from 8 years to 12 years, the increasing number of students re-entering the university entrance exam despite having been placed in previous years and an increasing number of people who were previously unable to get a higher education all indicate that the pressure on the demand for higher education will continue to be an issue in Turkey in the following years.

With the establishment of new universities and the increase in higher education quotas after 2006, policies aiming to rapidly expand higher education industry were implemented. Despite these new policies, the majority of those who enter the university entrance exam cannot be admitted into higher education programs due to an imbalance between the supply and demand of higher education.

Continuing disparity between supply and demand means that the youth are devoting excessive time (sometimes mounting up to years) to preparing for the university entrance system and as a consequence the demographic window of opportunity is not being utilized to its fullest extent. This situation strongly necessitates the revision of current policies. Therefore, focusing solely on the quality of policies by disregarding the popular demand for higher education has the risk of exacerbating the disparity between the supply and demand of higher education in Turkey.

CHAPTER B: Access and Participation in Higher Education

In 1983, the total number of students receiving higher education was around 335,000 and in 2016 the number grew more than 20 times, reaching 7,200,000. This resulted in Turkey having the largest higher education system in Europe. Even though Turkey's gross schooling rates have surpassed countries like the UK, Russia, France and are at par with the US, more than half of the higher education students in Turkey are registered in open education (i.e., off-campus) programs. This indicates that the capacity and infrastructure for face-to-face (i.e., on-campus) higher education should be further increased.

A dramatic growth in foundation (non-profit private) universities also took place in the last decade. Approximately 15% of the students who receive face-to-face education are studying at foundation universities. The expansion of the higher education system enabled higher education institutions to diversify and created new opportunities for students and academic personnel.

When observing the trends regarding the number of students and the gender ratio between the years 1983 and 2016, it can be seen that the percentage of female students has increased. In addition, looking at the net schooling rate of the 18-22 age group, it can be seen that the gap between

males and females in terms of schooling closed and that females are even surpassing male schooling rates.

Created as a result of the capacity issue in the provision of face-to-face education, open education now constitutes almost half of the higher education system. This ratio is 47% for bachelor's degree programs and 55% for associate degree programs. Despite the establishment of new universities, the demand for open education has not seen a decrease; in fact, the demand has grown over the last decade. This has had a negative impact on the Turkish higher education system's image and reputation.

Almost a quarter of the higher education system at the associate and bachelor's degree level is made up of evening school students. This indicates that evening school programs which were implemented to supplement the supply of higher education in the early 1990s have become increasingly embedded in the system, becoming a major route to higher education attainment.

By 2015, there were 13,655 disabled higher education students, constituting 0.2% of the total number of higher education students. When the disabled student ratio and the ratio of disabled people among the general population of Turkey are compared, it can be seen that disabled persons have limited access to higher education.

CHAPTER C: Outputs of Education

There has been a prominent increase in the number of higher education graduates in the last few years. The annual number of higher education graduates almost quadrupled between the years 1996-2015, increasing from 175,000 to 803,000. Despite this increase, the higher education graduation rate for the 25-64 age group (18%) is significantly lower than the OECD average (36%). Furthermore, Turkey's master's degree and doctorate program graduation rates are also low when compared to the OECD average.

Examining the gender ratio trends over the years, a significant rise in the number of females graduates can be observed between 1996-2015. While in 1996, only 73 females graduated for every 100 males at the bachelor's degree level, this number has now risen to 118 females per 100 males.

Considering that teaching certificate programs (pedagogical formation training) are open to almost everyone and the number of students that are currently taking and will be taking teaching certificate programs in the future along with the number of students in faculties of education, the number of teacher candidates is foreseen to increase in the following years. In other words, considering almost everyone is enabled to take teaching certificate programs, it can be expected that the already significant number of "unassigned teachers" will further increase in coming years.

In terms of the employment rates of higher education graduates, there is a 10-point gap between females and males in OECD countries, to the disadvantage of females. This gap consists of 20 points in Turkey.

When compared to the OECD average, in Turkey, having a higher education diploma has a greater impact on income. Moreover, with seniority income also increases in Turkey.

CHAPTER D: Academic Staff

The number of academic staff in Turkey has steadily increased between the years 1983-2016. By 2016, the total number of academic staff in Turkey has surpassed 150,000. The employment of academic staff by universities that were founded from 2006 onwards was a determinant of this increase. Moreover, the female academic staff ratio in Turkey's higher education institutions reached the OECD average by 2016.

CHAPTER E: Educational Environments

The number of higher education institutions increased from 19 to 183 between the years 1981-2016. Despite this significant growth, the number of universities in Turkey remains inadequate, especially when compared with other countries that have a similar population size. While there are 2.1 universities per 1 million people in Turkey, this rate is over 10 in the US, Russia, Denmark, Malaysia, Poland, Switzerland, and Norway.

The number of students per faculty member is above the OECD average. The higher student to teacher ratio forces academic staff to dedicate more time to lectures and less time to research. Moreover, looking at the numbers of students per faculty member and academic staff by university, it can be seen that the rates vary all across Turkey.

CHAPTER F: The Financing of Higher Education

Higher education's share in both the government's budget and of the total GDP are on the rise. As of 2017, the Turkish higher education sector's share in both the government's budget and the GDP are above the OECD average. In terms of expenditure per student, Turkey has a lower expenditure than the OECD average. It can be asserted that Turkey's preferred higher education policy is to increase access to higher education and that this will also be the case in the years to come. In this respect, the most important issue is to preserve the quality of education while increasing accessibility.

Universities in Turkey acquire a small portion of their income from local administrations. This shows that the cooperation and collaboration between universities and local administrations should be improved. In addition, aids, sponsorships, grants and donations to universities and university students from private enterprises and institutions are also at a low level.

CHAPTER G: Performance of Academics and Universities

The number of scientific publications in Turkey has been on the rise for years; however, the number of citations has failed to follow this trend, causing the number of citations per publication to decline. This indicates an issue with the average quality of scientific publications in Turkey. Moreover, looking at the publication number rankings, it can be seen that Turkey has been ranking between 18th and 20th and failing to progress any higher in the rankings in the last years. Aiming to become one of the top 10 economies by 2023, thus establishing an economy based on advanced technology and knowledge, Turkey has to scrutinize this situation.

In both the world and regional university rankings, it can be seen that the top universities have higher rates of international researchers and students than universities in Turkey, while maintaining lower numbers of students per academic staff ratios. Moreover, the top-ranking universities in these rankings usually have less than 20,000 students. Considering that rankings rely heavily on the number of scientific publications, it is evident that these top-ranking universities attract prominent researchers with numerous publications.

Recommendations

- Considering that the pressure on the demand for higher education will exacerbate in the following years, policies aiming to simultaneously improve the higher education capacity and quality must be implemented in order to better manage the disparity between supply and demand in higher education.
- The proportions of open education and evening programs in the Turkish higher education system must be minimized.
- The number of universities in Turkey must be increased in order to satisfy the demand for higher education.
- Support and incentive programs for master's degree and doctorate students must be diversified and improved. Taking Turkey's need for academic faculty into account, the annual number of doctorate graduates must be increased from 5,000-6,000 to at least 15,000 by 2023.
- Measures should be taken in order to make campuses more accessible to persons with disabilities and to increase the number of disabled students in higher education institutions.
- Considering that female higher education graduates have better employment and income prospects, females should be encouraged to attend higher education institutions.
- Certain measures should be taken in order to improve the efficiency of faculty training programs both in Turkey and abroad.
- Considering the need for further expansion of the Turkish higher education system, more public resources should be allocated to higher education.
- Universities should be more active in fields such as R&D, income-generating or social assistance projects, consultancy, distance education and lifelong learning programs.

- Along with a number of publications and patents, additional criteria such as number of citations and licensed products with patents should also be taken into account in decisions regarding academic promotions and appointments.
- In order to improve the quality and international reputation of universities in Turkey, special policies aiming to attract quality international researchers and students to Turkish universities should be developed.
- Higher education administrators and the top management should be made more accountable to society in order to truly improve Turkish universities' relations with the industry and the society.

CHAPTER A

TRANSITION TO HIGHER EDUCATION

The transition from secondary to higher education is not only a critical juncture for students but it is also a significant issue for the education system to manage. Indeed, since higher education graduates around the world have relatively better occupations with higher status, earn higher salaries and live healthier and longer lives, the problem of identifying who receives higher education is an important issue in terms of policy (Helms, 2008). According to current data nearly half of the youth population in OECD countries is receiving a higher education (OECD, 2017). Due to its benefits for both individuals and for society as a whole, higher education is supported by the state in almost all countries. However, since in developing countries such as Turkey the higher education capacity is relatively limited and the youth population is relatively high, centralized examinations are held in order to regulate the transition from secondary to higher education and these exams exert immense pressure on students.

Due to the large gap between supply and demand in higher education in Turkey, those secondary school students who wish to be placed in a higher education program have to study intensively throughout their secondary education and/or after graduation in order to get admitted. For those who are placed in a good higher education program after studying intensively, the entrance exam is perceived as the key to getting a good job and becoming successful. On the other hand, for those who could not get placed in a higher education program or in a good one, it is perceived as having to choose between either preparing once again for a competition that requires intense effort, or starting one's career with lower employment prospects. Therefore, higher education entrance exams not only serve in the selection of students for higher education, but they also have a deep impact on the secondary education system.

In this Chapter, the indicators regarding the transition to higher education will be discussed. The section will begin with the numbers concerning current students and graduates of secondary education which constitutes the source of students for higher education. Following this, the ratio of transition to higher education will be examined. Afterwards, the Transition to Higher Education Examination (YGS) and Bachelor Placement Examination (LYS) and the average results of these examinations will be discussed.

The gender ratio that will be used frequently in this chapter and in the following chapters consists of the gender parity index multiplied by 100 and serves as another important indicator of participation in higher education. According to UNESCO's definition (2017), the gender parity index is obtained in any given indicator by dividing women's ratio by men's ratio. If the resultant ratio is 1 this indicates that there is equality between men and women. If the ratio is less than 1 this indicates an unfavourable situation for women and if the ratio is more than 1 it indicates a favourable one. For indicators in which numbers close to zero are considered as positive (such as attendance and dropout rates) the interpretations are reversed. Therefore, in these conditions if the ratio is less than 1 this indicates a favourable situation for women and if the ratio is greater than 1 this indicates an unfavourable situation for women.

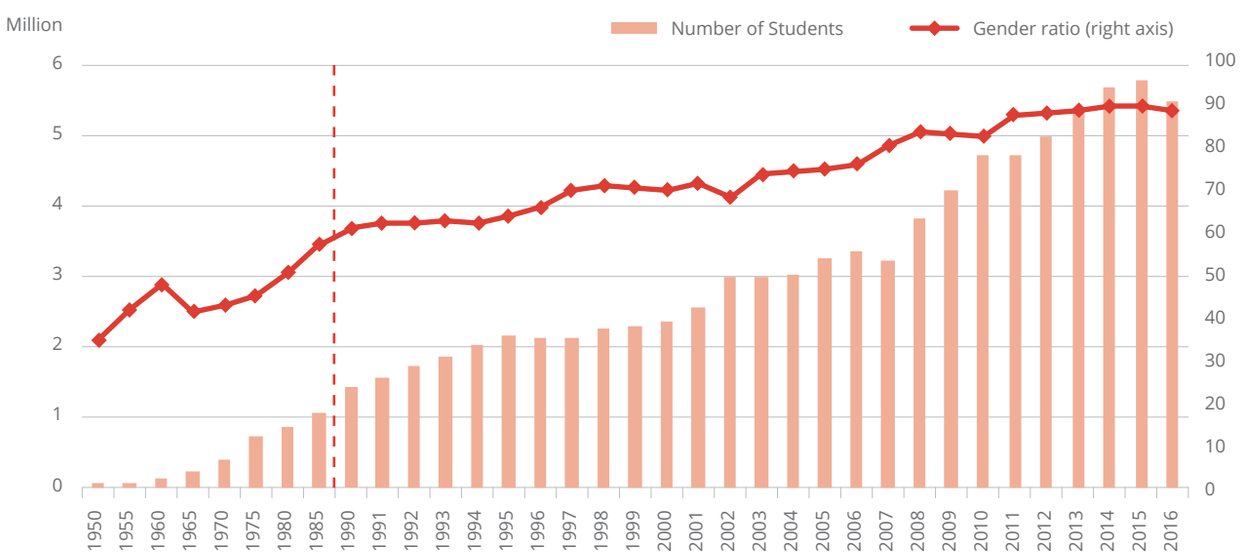
INDICATOR A1

SECONDARY EDUCATION STUDENT NUMBERS

The trend between 1950 and 2016 in terms of the total number of students and the gender ratio is illustrated in Figure A.1.1. As Figure A.1.1 shows, the number of students receiving a secondary education generally increases continuously. This increase is not a phenomenon that can be explained only through population dynamics. Education policies, the increasing demand for educated people created by rapid development and therefore the increased expenditure on the education system also had an impact on this increase.

In particular, the most important factor that contributed to the recent increase in the total number of students in secondary school was the legal reform No. 6287, publicly known as 4+4+4, which increased compulsory education from 8 to 12 years. Due to this legislation, which was passed in 2012, the number of students who completed their compulsory primary education and started their secondary education increased rapidly. As a result of this, the total number of students in secondary school increased from 4,756,000 in 2011, to 5,808,000 in 2015. However, in 2016, although it was expected that 12-year compulsory education would become more efficient five years after the implementation of 4+4+4, there has since been a decrease of 296 thousand in the total number of students. A portion of this decrease seems to be related to the decline in new enrolments. Indeed, although around 1,366,000 students graduated from primary school in 2015, this number declined to 1,162,000 in 2016. The remaining decline of 100,000 seems to be related to the decline in the total number of students enrolled in open-education high schools. While the total number of students in open education high school was 1,536,000, this number declined to 1,287,000 in 2016 (MONE, 2016, 2017).

Figure A.1.1 Total number of students in secondary school and the trends in the gender ratios (1950-2016)

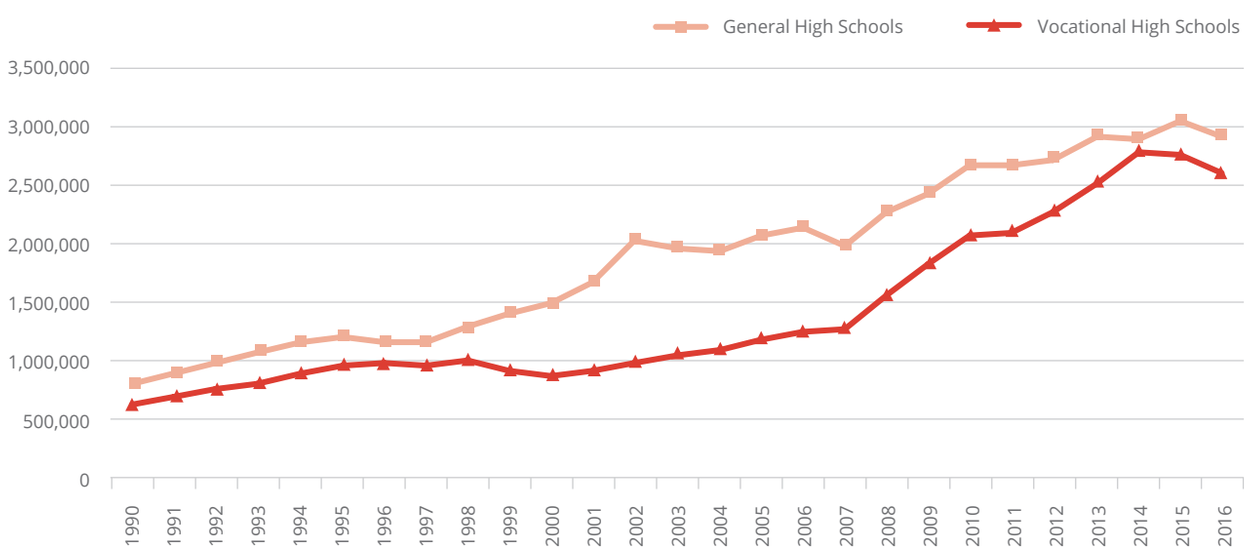


Source: Compiled using the Ministry of National Education (MONE) statistics published in various years.

The gender ratio indicated with a line in Figure A.1.1 indicates the number of female students for every 100 male students. According to the figure, the participation of female students has increased steadily over time. While there were 69 female students for every 100 male students in 2002, this ratio increased to 90 in 2016. There

is no doubt that policies aimed at increasing compulsory education were the primary factor in the increase in female student ratios. Nevertheless, as seen in the figure, parity has not been reached between female and male students. Starting from the secondary education level, it is understood that a gender balance has not been reached in the overall education system. However, as we will discuss later on, the female-male balance differs between high schools (see Figure A.1.3). On the other hand, when we consider the net schooling ratios of students between the ages of 14-17 according to gender, it is evident that the gap between male and female schooling ratios has been decreasing since 2012. In fact, in 2015 the schooling ratio for female students (80.2%) surpassed the schooling ratio for male students (79.4%) for the first time (Eğitim-Bir-Sen, 2016). When the gender ratios provided above are considered alongside the net schooling ratios for the 14-17 age group, provided that current trends continue, it is probable that in the coming years the gender balance will further improve in favor of female students.

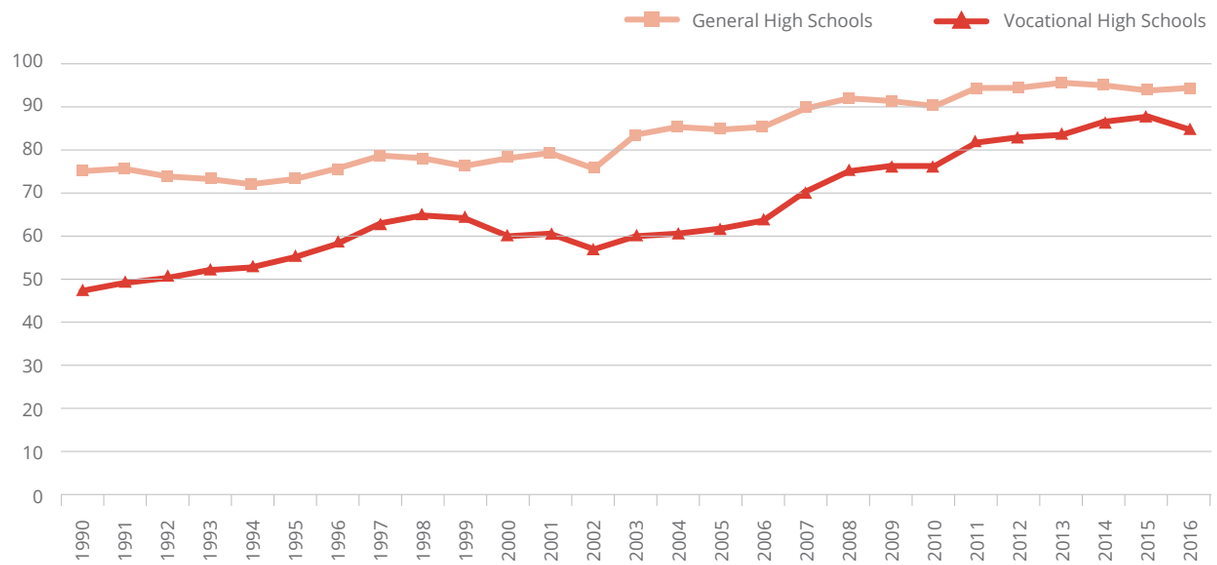
Figure A.1.2 Trends in the number of students in general and vocational high schools (1990-2016)



Source: Compiled using the Ministry of National Education (MONE) statistics published in various years.

Figure A.1.2 illustrates the changes in the number of students in general high schools and vocational high schools between 1990-2016. In accordance with the increase in schooling ratios, both high school groups have experienced increases in student enrolment. In addition to this we can see that between the years 1990-2016 the number of students in general high schools has remained comparatively higher than vocational high schools. On the other hand, the student ratios for vocational high schools have been fluctuating over the years. In particular, vocational school attendance was adversely impacted by the application of differing quotients in the university entrance system after 1998 (Gür and Çelik, 2009). Nevertheless, due to the efforts of the Justice and Development Party (AK Party) governments to promote vocational training and the increasing belief in the resolution of the quotient problem, the tendency to attend vocational schools has increased and vocational education has experienced a profound recovery (Özer, Çavuşoğlu and Gür, 2011). The ratio of students in vocational high schools to the total number of students increased from 44% in 1990 to 47% in 2017. This indicates that throughout the years the number of vocational high school students has increased more in relation to general high school students, although the increase occurred in a fluctuating manner. Indeed, according to an analysis conducted on the basis of average growth statistics, the

Figure A.1.3 Trends in the gender ratio in secondary education according to school type (1990-2016)



Source: Compiled using the Ministry of National Education (MONE) statistics published in various years.

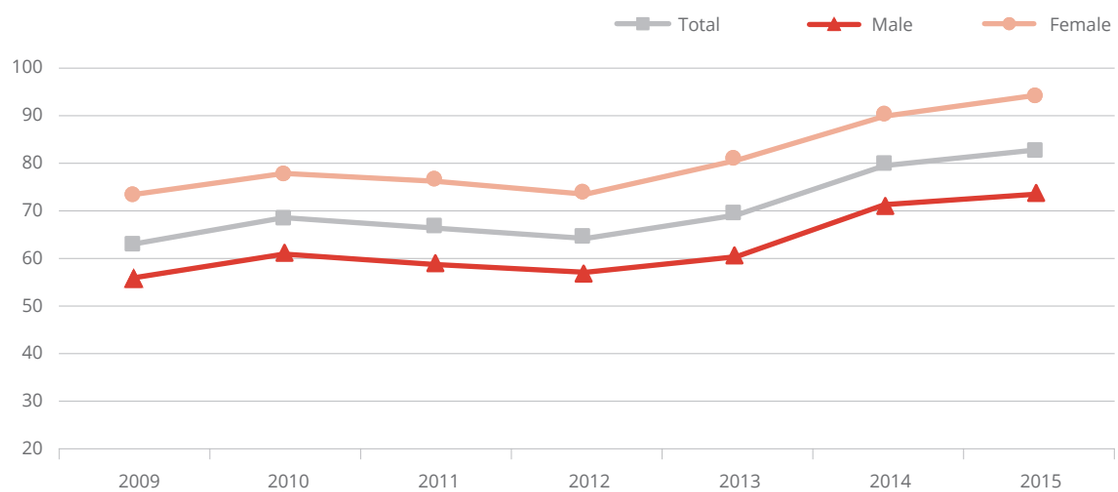
growth rate of the number of students in vocational high schools was found to be higher than the growth rate in general high schools (Eğitim-Bir-Sen, 2016).

Figure A.1.3 shows the changes in gender ratios between the years 1990-2016 according to school types. As the figure indicates, the changes in the gender ratio of general high schools have been, for the most part, positive. In 1990 there were 75 female students for every 100 male students and in 2016 there were 95 female students for every 100 male students. This indicates that gender balance has not been fully reached in the secondary education sector. However, as previously discussed, if the positive trend in net schooling ratios for the 14-17 age group continues, it is probable that gender imbalances in education will be resolved When considered in terms of gross schooling, there is a similar situation in vocational high schools as well. In 1990 there were 47 female students being educated for every 100 male students in vocational high schools; in 2016 this figure increased to 84 female students being educated for every 100 male students.

INDICATOR A2 GRADUATION IN SECONDARY EDUCATION

The change in secondary education graduation rates between 2009-2014 according to gender is shown in Figure A.2.1. The graduation rate used here is an approximation and it is determined by calculating the ratio of the number of students enrolled and the number of students in preparatory classes to the number of graduates. In other words, when the graduation rate for a specific year is being calculated, the number of preparatory class students is subtracted from the sum of freshly enrolled and 9th grade students and the resultant number is divided by two. Afterwards, the ratio between the number of graduates that graduated 4 years later and the total number of students is calculated and is multiplied by 100 (Eğitim-Bir-Sen, 2016).

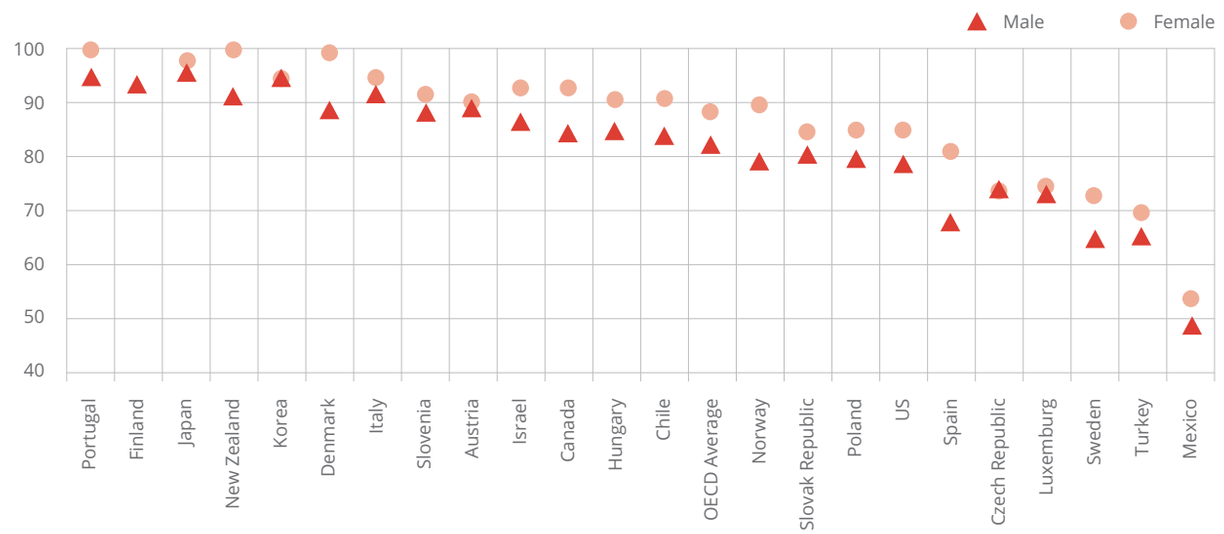
Figure A.2.1 Trends in secondary education graduation rates by gender (2009-2015)



Source: The figure, prepared originally by Eğitim-Bir-Sen (2016) using MONE statistics, was updated by the authors.
Note: Open education high school students were not included in the calculations

Between the years 2009 and 2015, both male and female secondary graduation rates fluctuated; in some years they increased, and, in some years, they decreased (Figure A.2.1). There has been significant progress in both male and female graduation rates from 2009 to 2015. As of 2009, for every 100 male students who began their secondary education 4 years before, approximately 56 graduated. This ratio increased to 73 in 2015. Similar progress has been achieved for female students. As of 2009, approximately 73 out of 100 female students graduated. As of 2015, approximately 94 out of 100 female students have graduated. In summary, during the aforementioned years female students have been in a better position compared to male students. The fact that female students tend to have higher graduation rates than male students can be interpreted in two ways. First, since relatively successful female students continue their education in high school, female students can be expected to have higher graduation rates. Second, when school grades and national examinations (for ex. YGS and LYS) are considered, female students tend to demonstrate a higher academic success rate than male students in Turkey (Bulut, Gür, Sriraman, 2010). Furthermore, the fact that grade repetition occurs more with male students in relation to female students increases the graduation ratio of female students. Moreover, as we will discuss later on, the case of female students hav-

Figure A.2.2 Secondary education graduation rates by gender for some OECD countries (2014)



Source: Compiled using OECD (2016) data

ing higher graduation rates compared to male students is not unique to Turkey and applies to other OECD countries as well (Figure A.2.2).

Figure A.2.2 comparatively presents OECD countries' secondary education graduation rates according to 2014 data. According to these figures, Turkey is significantly below OECD averages both in terms of male and female graduation rates. Among OECD countries, Turkey only fares better than Mexico. The average secondary education graduation rate in OECD countries is 85%, while Turkey has a rate of 70% (OECD, 2016). There is a divergence between our calculations and the OECD's regarding male and female graduation rates. The main reason for this is that our calculation excludes open education students and is an approximation. However, OECD's calculation was based on the exact number of male and female students. However, it is clear from both approaches that the secondary education system in Turkey is not working efficiently. According to Figure A.2.1, from the 100 that enter the system, 83 students graduate. Moreover, 30 of the 100 male students who enter the system are not able to graduate.

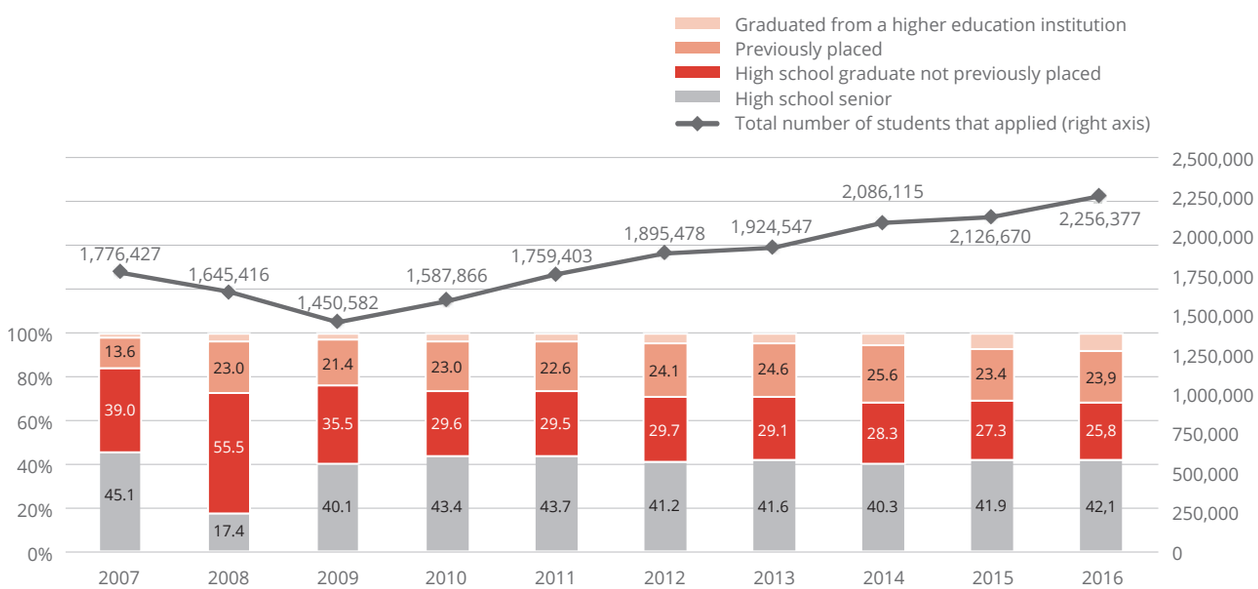
INDICATOR A3

RATIOS OF TRANSITIONING TO HIGHER EDUCATION

The number of candidates who applied to the university entrance examination in the 2007-2016 period and their proportional distribution in relation to their high school graduation and the previous placement situation is shown in Figure A.3.1. While 1 million 776 thousand individuals applied to the university entrance exam in 2007, this number increased to 2 million 256 thousand in 2016. According to an official statement released by the Measuring, Selection and Placement Centre (ÖSYM) the number of candidates who applied to the university entrance examination has now reached 2 million 266 thousand (ÖSYM, 2017). In other words, **the demand for higher education continues to increase in 2017.**

Although the number of applicants has generally increased from 2007 to 2016, there were clear declines in 2008 and 2009 (Figure A.3.1). The main reason for this was the decline in new graduates in 2008 due to the implementation of new legislation making high school four years. Indeed, when the proportional distribution of high school graduates and previous placement cases are considered, the placement of high school seniors declined significantly in 2008. In other words, only 17.4% of placements were high school seniors in 2008. Between 2009 and 2016, the ratio of high school seniors remained almost stable at over 40%. The number of students has since increased every year and in 2016 surpassed 950 thousand. **However, the categories of applicants that increased the most between 2007 and 2016 were those who were previously placed in a higher education program and those who have graduated from a higher education institution.** Indeed, while only 39,625 of 2007 applicants were graduates of a higher education institution, this number reached 184,585 in 2016. Similarly, while only 242,262 applicants were previously placed in a higher education institution, this number reached 538,953 in 2016. **When these two findings are considered together, it can be observed that the increasing pressure on the uni-**

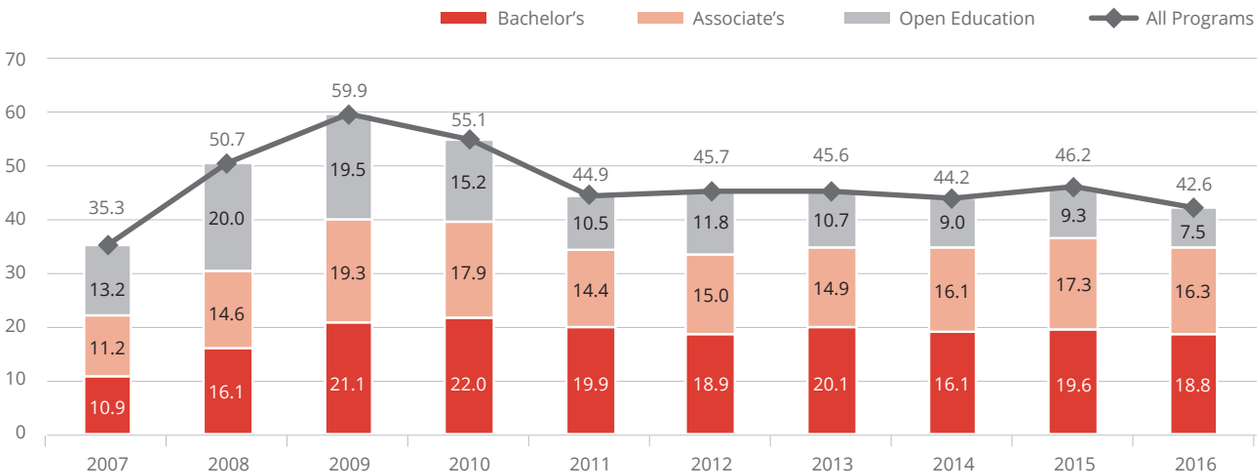
Figure A.3.1 Trends in the proportional distribution of those who applied to the university entrance exam according to the circumstances of their high school graduation and previous placements (2007-2016)



Source: The figure, prepared originally by Eğitim-Bir-Sen (2016) using MONE statistics, was updated by the authors.

versity entrance system is a result of university students and graduates who are retaking the examination. This situation can be interpreted as higher education programs failing to adequately satisfy students/graduates, and/or failing to become attractive enough in terms of employment prospects. However, it can also be interpreted as the result of increased access due to the expansion of the higher education system and/or increasing prosperity leading to students/graduates engaging in new pursuits through a paradigm of lifetime learning.

Figure A.3.2 Trends in the ratio of students who were placed in various higher education programs to the number of students who applied to the university entrance exam (2007-2016)



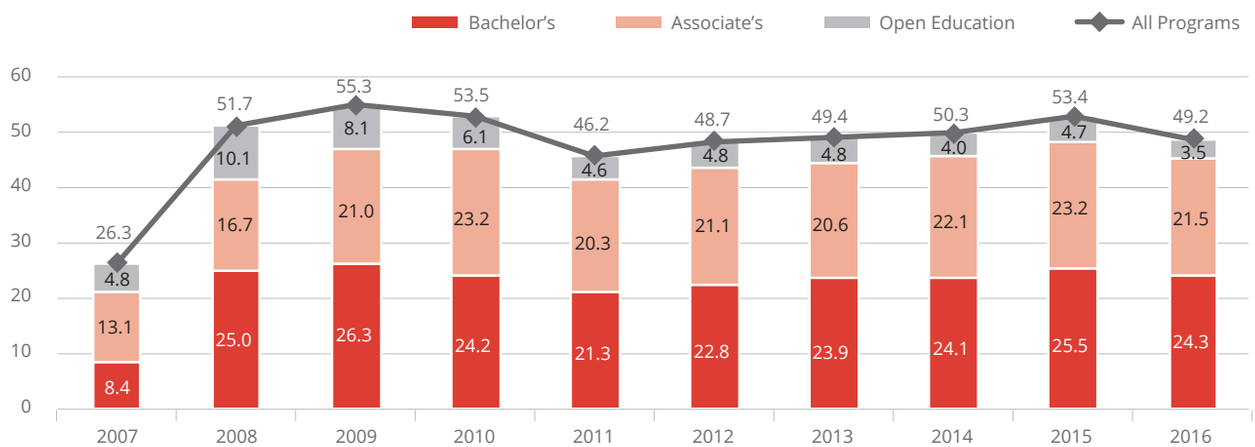
Source: The figure, prepared originally by Eğitim-Bir-Sen (2016) using MONE statistics, was updated by the authors.

Figure A.3.2 indicates the ratio of student placements in various higher education programs according to the number university entrance examination applicants between the years 2007 and 2016. **The main reason for the rapid increase of the ratio of placements is the new capacity generated by quota increases that accompanied the establishment of new universities.** In the years 2006-2007, in order to make higher education more accessible throughout the country, a policy to ensure that no province is left without a university was enacted. In light of these developments the placement ratios rose to a record high level of 59.9%. The main factor that contributed to the high ratio of placements in 2009 is the fact that the number of graduates was negatively impacted by the introduction of the four-year high school program beginning in 2008 and an overall decline in the total number of applicants. Indeed, while 1,776,441 students applied to the Student Selection Examination (ÖSS) in 2007 this number declined to 1,646,376 in 2008 and 1,451,350 in 2009.

Another noteworthy point that can be observed in the distribution of various higher education programs is that with the additional capacity generated by the increase in quotas and the establishment of new universities the ratios increased for the three main programs (bachelor's, associate's, open education) (Figure A.3.2). The placement ratio, which was 35.3% in 2007 increased to 50.7% in 2008 and to 59.9% in 2009. **However, there was a sharp decline in total placements between 2009-2016 from 59.9% to 42.6% despite the establishment of new universities and improvements to their infrastructures, increased institutionalization, and quota increases.** In other words, the fact that the total capacity and therefore access could not be increased adequately despite the establishment of new universities clearly demonstrates that the major gap between supply and demand in the entrance system persists. Nevertheless, the new capacity generated by the establishment of new universities and the quota increases in old universities led to a decrease in the ratio of people choosing the open education option.

This claim is supported by the fact that between 2009 and 2016 there isn't a significant proportional difference in the interval that represents those who were placed in bachelor's programs while there is a clear decline in the ratio of those who were placed in open education programs. When taken into consideration with the imbalance between supply and demand it can be determined that when applicants are given more alternatives they choose open education in lesser proportions. We can also say that the overall higher education supply is still substantially lower than the demand.

Figure A.3.3 Trends in ratios of students who applied to the university entrance exam in their senior year and were placed in a higher education program according to those who applied to the university entrance exam in their senior year (2007-2016)



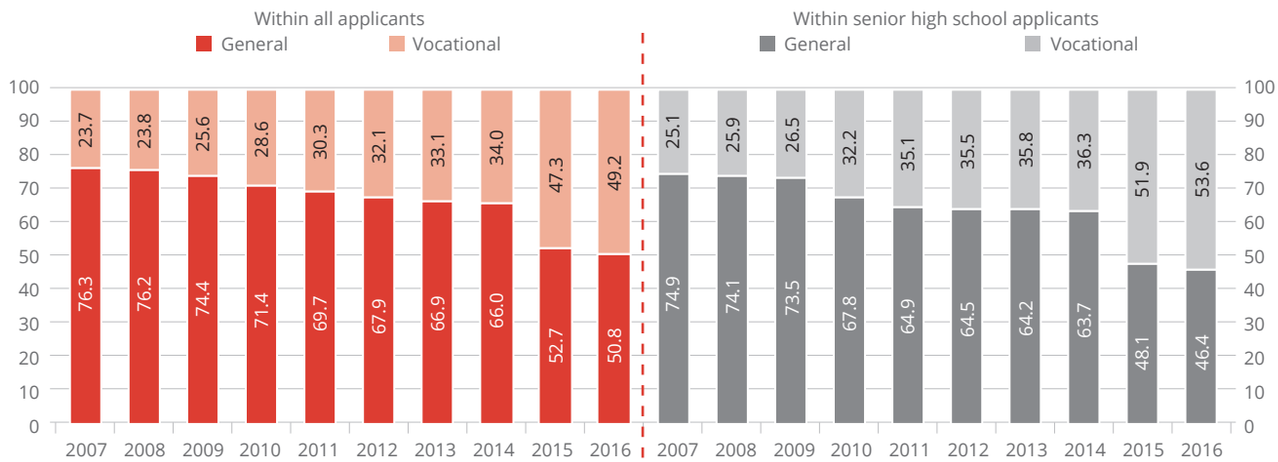
Source: The figure, prepared originally by Eğitim-Bir-Sen (2016) using MONE statistics, was updated by the authors.

Figure A.3.3 illustrates the distribution and ratio of those who applied to the entrance exam during their senior year in high school and were placed in higher education programs according to the total number of high school seniors who applied to the examination during the 2007-2016 period. This ratio also provides some indication regarding the ratio of students who could not be placed in higher education program. **The increase in the placement ratio of seniors, especially following 2008, is quite significant.** While only 26.3% of seniors who applied to the university entrance exam could be placed in 2007, this number increased to 51.7% in 2008 due to the decline in the number of graduating students arising from the introduction of the four-year high school program and efforts made to increase higher education quotas. Due to the increasing quotas and the low applicant pool in 2009, 55.3% of high school seniors were placed in a higher education program. While the number of high school seniors who applied for the examination was 800 thousand in 2007, it was only 286 thousand in 2008, 582 thousand in 2009 and rose to 690 thousand in 2010. Although the number of high school seniors who took the examination and were placed in a higher education program declined in 2008 compared to 2007, this number has rapidly increased since 2009. Indeed, the establishment of new universities and increases in quotas in other universities clearly had an impact on this rapid increase.

According to the figure above that shows the data for the 2007 to 2016 period, the number of high school seniors who could not be placed in higher education programs after taking the university entrance examination is at least 44.7% of the total (Figure A.3.3). The average ratio of students who transitioned to higher education between these years is 48.4%. **These ratios indicate that due to lack of adequate capacity, only one out of two students can immediately transition into higher education following their high school graduation.** Furthermore, as it will be discussed later, the placement ratios differ significantly according to school type.

Finally, due to the establishment of bachelor's programs in new universities and the quota increases in the bachelor's programs of old universities there have been substantial changes in the number of students placed in bachelor's degree programs in comparison to the associate's degree program placements. While more students were placed in associate degree programs than bachelor's programs in 2007, between the years 2009-2016 there have been significant increases in bachelor's program placements and these placements surpassed associate's program placements (Figure A.3.3). Moreover, with the increase in quotas for programs that provide face to face education there has since been a decline overtime in the placement ratios for open education programs.

Figure A.3.4 The trends in the proportional distribution of university entrance exam applicants according to high school type (%) (2007-2016)

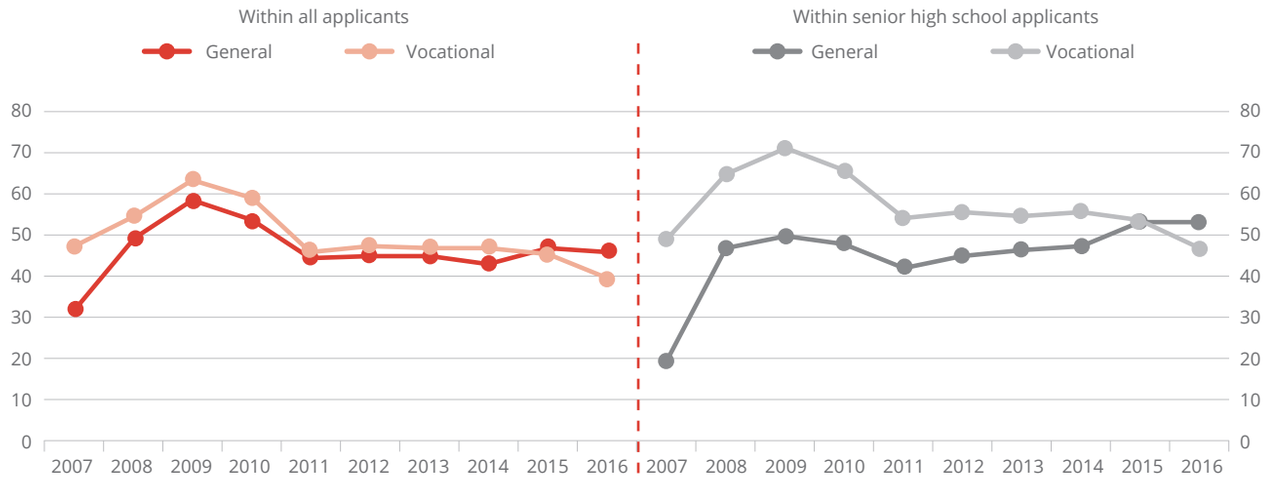


Source: The figure, prepared originally by Eğitim-Bir-Sen (2016) using MONE statistics, was updated by the authors.
Note: Multiprogram high schools, open education high schools and fine arts high schools were presented within the category of general high schools until 2015. However, since 2015 they are presented under the category of vocational high schools. Moreover, teacher high schools are presented as a separate category since 2015. However, for the purpose, of consistency they are presented under the category of general high schools. This should be taken into account when interpreting data from before and after 2015.

The change in the proportional distribution of applicants between the years 2007 and 2016 for the university entrance exam according to types of high schools they graduated from is shown in Figure A.3.4. According to this, while 23.7% of all students who applied to the university entrance exam in 2007 graduated from vocational high school, this ratio increased to 49.2% in 2016. Similarly, while 25.5% of high school seniors who applied to the examination were from a vocational high school, this ratio increased to 53.6% in 2016. **In other words, the share of vocational high school graduates among university entrance exam applicants has steadily increased.** The primary reasons for this are the increase in interest in vocational high schools due to the abolishment of the quotient system used in the university entrance exam, policies implemented by the AK Party governments to increase the proportion of students attending vocational high schools, and finally the increase in the number of vocational high schools due to the conversion of general high schools into vocational high schools and Anatolian high schools.

Figure A.3.5 shows the proportional distribution of university entrance exam applicants placed in higher education programs between the years 2007 and 2016 according to high school types. The figure indicates that from 2007 to 2015, the higher education placement ratios of vocational high school graduates have remained higher than the placement ratios of general high school graduates in the same field. The main reason for this is the opportunity for vocational high school graduates to enroll in associate degree program without having to take an entrance examination.

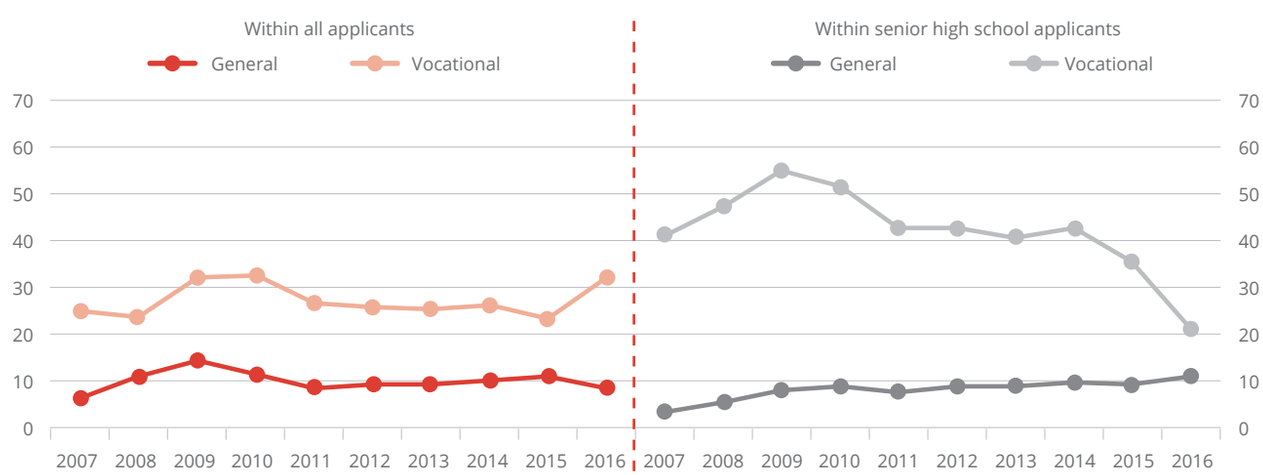
Figure A.3.5 Trends among the higher education placement ratios for university entrance exam applicants by high school (%) (2007-2016)



*Source: T*he figure, prepared originally by Eğitim-Bir-Sen (2016) using MONE statistics, was updated by the authors.

As shown in Figure A.3.6, there has been a noticeable decrease in recent years in the placement of high school seniors who have applied to the university entrance exam into associate's degree programs. Between 2007 and 2016, among general high school graduates who applied to the university entrance exam, not more than 9% were placed in associate's degree programs. **While the placement ratio of vocational high school seniors who applied to the university entrance exam totalled 55% in 2009, this number declined to 21% in 2016.** This ratio is relatively low considering all the measures taken to help enable vocational high school graduates to transition into higher education. The main reason for this decline is that while the total number of vocational high school students has been increasing, the quotas for transitioning to higher education without an examination have not kept up. Since

Figure A.3.6 Trends in the placement ratio into associate's programs for university entrance exam applicants by high school (%) (2006-2016)

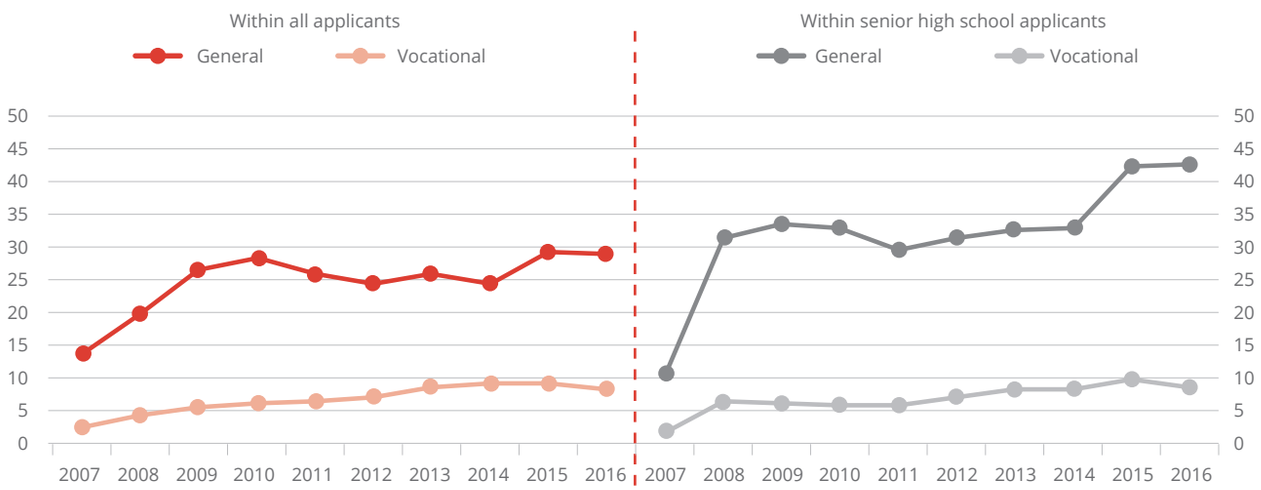


Source: The figure, prepared originally by Eğitim-Bir-Sen (2016) using MONE statistics, was updated by the authors.

the right to transition to a higher education program without taking an examination has been revoked for vocational high school graduates, it is probable that this decline will continue in the coming years.

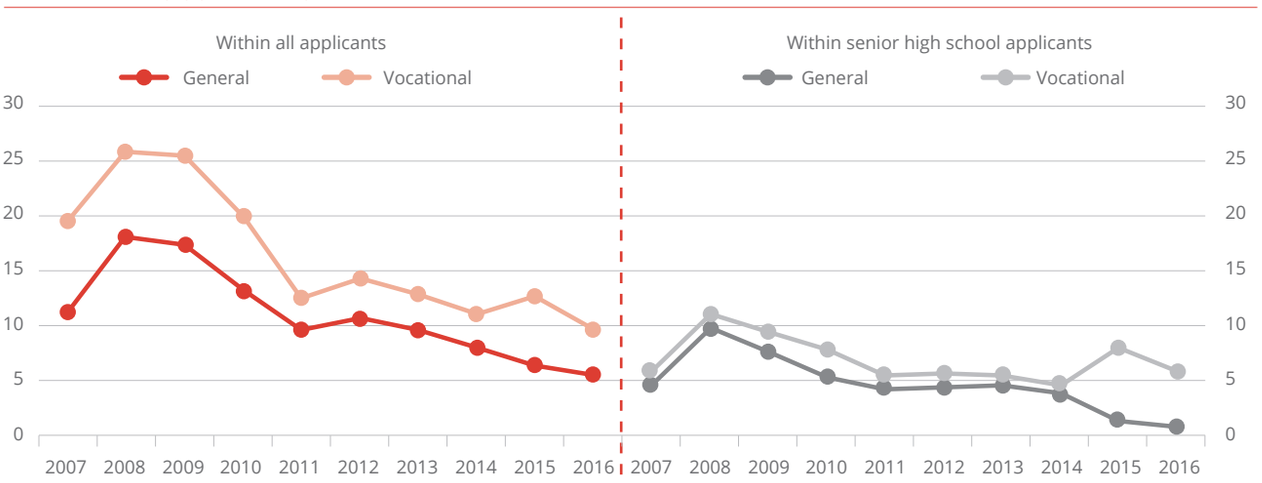
As shown in Figure A.3.7, between the years 2007-2016 the bachelor's program placement ratios of vocational high school graduates have increased relatively less compared to those of general high school graduates. The main

Figure A.3.7 Trends in the placement ratio for university entrance exam applicants into bachelor's programs by high school (%) (2006-2016)



Source: The figure, prepared originally by Eğitim-Bir-Sen (2016) using MONE statistics, was updated by the authors.

Figure A.3.8 Trends in the placement ratio for university entrance exam applicants into open education programs by high school (%) (2007-2016)



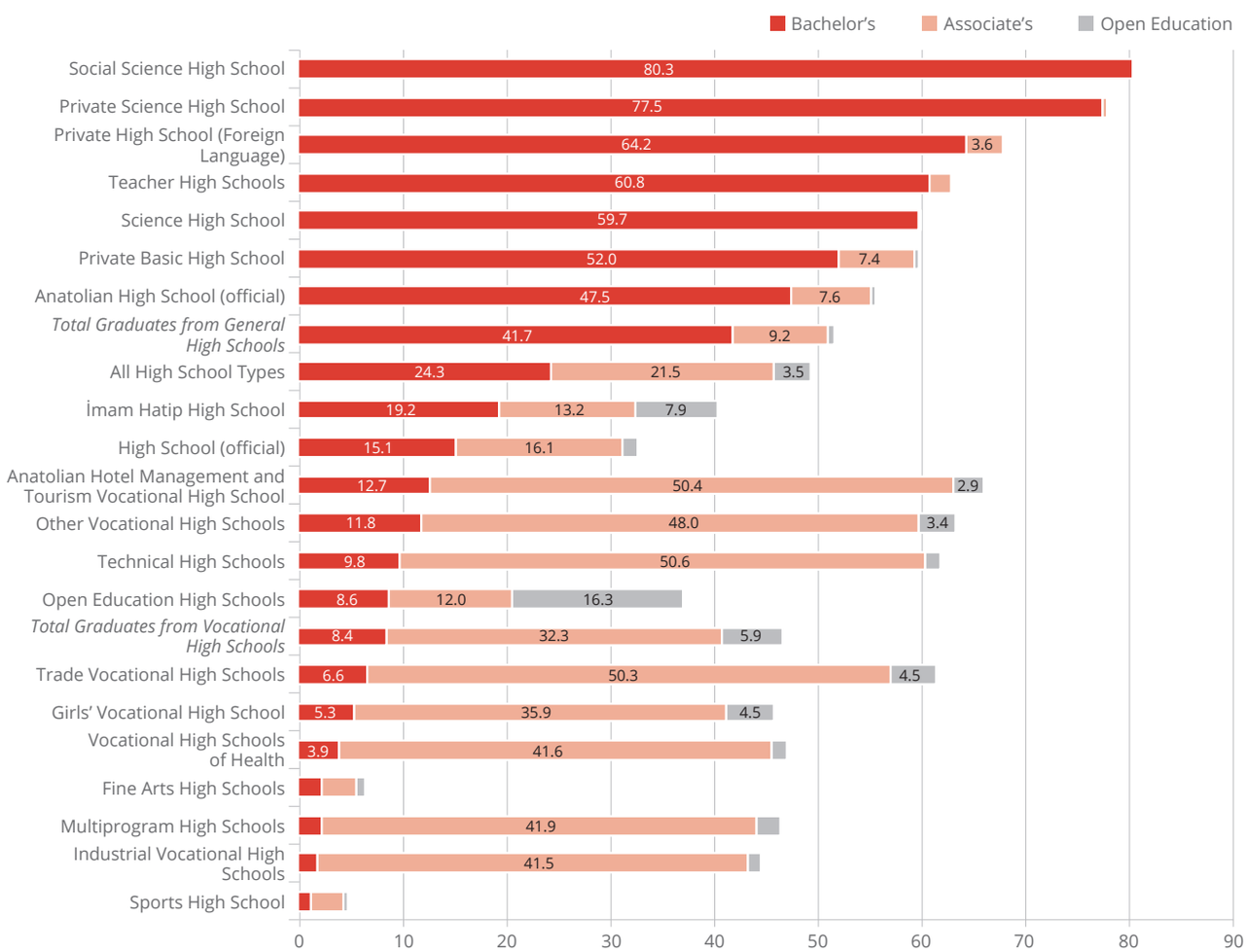
Source: Compiled using MONE statistics published in various years.

reason for this is that general high school graduates are academically better prepared for the university entrance exam in comparison to vocational high school graduates.

Figure A.3.8 shows the ratio of university entrance exam applicants between 2007-2016 who were placed in open education programs according to high school type. Ac-

cording to this, between 2007 and 2016 the placement ratios of both general and vocational high school seniors and graduates into open education programs have generally declined. As it has been discussed before, the main reason for this is that when offered alternatives students tend to choose face to face education over open education. Figure A.3.9 shows the ratios of high school seniors who were placed in higher education programs after applying to the university entrance examination in 2016, according to type of high school graduation and program placement. When the placement ratios of high school seniors who applied to the university entrance exam into bachelor's, associate's, and open education programs are considered, it can be observed that there is a very clear differentiation between the various types of high schools. While the graduates of more academic high schools such as science high schools, private science high schools, social science high schools get placed mostly in programs that award a bachelor's degree; the graduates of more vocational and technical types of high schools such as tourism and hotel management are mostly placed in associate's degree programs. In this framework, while only 8.4% of vocational high school graduates are placed in bachelor's degree programs, 41.7% of academic (general) high school graduates are placed in bachelor's degree programs. This long-standing inequality of opportunity generates the gap between the placements of students from different types of high schools (Eğitim-Bir-Sen, 2016). Over the years, this differentiation has solidified and resulted in a type of "hierarchy" among schools. Due to this hierarchy of success and failure, the

Figure A.3.9 Ratios of those who placed in higher education programs according to high school type and the type of placement program (2016)



Source: Compiled using MONE 2016 statistics

competition to get into schools considered to be better by families and students has increased over the years (Çelik, 2015; Gür, Çelik and Coşkun, 2013).

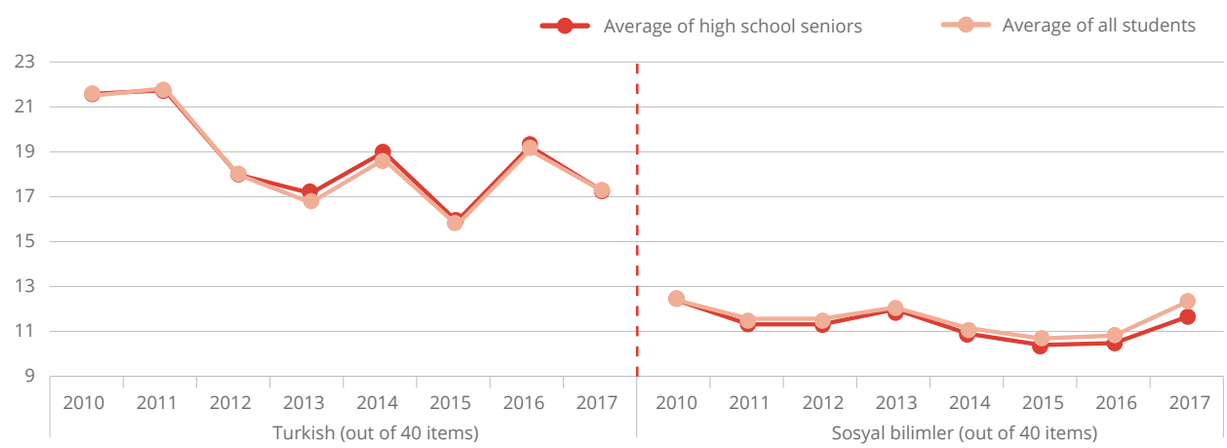
Since academic and vocational high schools have different orientations, graduates from academic high schools are expected to be more successful in an examination that measures academic skills. **However, the large differentiation of success rates between high school types is one of the most chronic problems of the Turkish national education system.** Two points need to be highlighted in the context of Turkey. First, there is a major gap between the academic skills acquired by vocational high school graduates and academic high school graduates. Second, there is significant differentiation among academic high school types as well. To put it in general terms, the differentiation between school types as well as the differentiation within the same school type is quite high. Since 2003, the PISA evaluations conducted annually by OECD clearly demonstrate these high levels of differentiation between school types in Turkey (EARGED, 2005; MONE, 2013; Polat, 2014; World Bank, 2013). In terms of the system the main problem is not being able to reduce this differentiation which increases pressure on the high school entrance exams. Furthermore, the pressure on high school entrance exams increase, the differentiation between high schools become solidified which makes the secondary education system even more defined in terms of hierarchy.

INDICATOR A4

SUCCESS IN THE TRANSITION TO HIGHER EDUCATION EXAMINATION (YGS) and BACHELOR PLACEMENT EXAMINATIONS (LYS)

Selection and placement processes to higher education institutions in Turkey are conducted by the Assessment, Selection and Placement Centre (ÖSYM). In this respect, the Student Selection and Placement System (ÖSYS) is administered. In order to calculate the final ÖSYS placement scores, the Secondary Education Success Points (OBP) must be assessed along with the scores from a two-stage examination. The first stage of the two-stage examination is the Higher Education Examination (YGS) which is accessible to all candidates. Those who obtain a score higher than the determined threshold are enabled to enter the Bachelor Placement Examinations (LYS) in accordance with their desired undergraduate program. Average results of the students entering the YGS and LYS provide insight into Turkey's education system, especially in terms of the success of secondary education graduates. Moreover, as the YGS consists of Turkish, social sciences, basic mathematics and natural science tests that are all based on the secondary education curriculum, the exam results provide a general understanding of the level of success of all high school graduates, regardless of the type of high school they attended. Similarly, as the LYS also consists of tests based on Turkish high school curriculums s, it provides insight into the readiness of secondary education graduates for higher education.

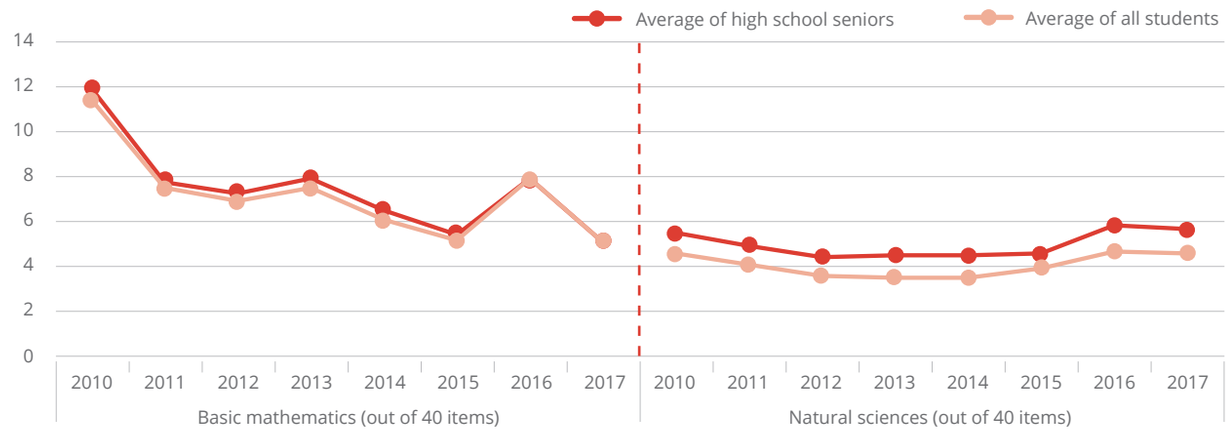
Figure A.4.1 Trends in average scores in Turkish and social sciences tests in YGS (2010-2016)



Source: Compiled from YGS statistics published by ÖSYM in various years.

When looking at the level of success of students entering YGS Turkish, social sciences, basic mathematics and natural sciences tests between the years 2010-2016, the most significant finding is that the average scores are fairly low (Figure A.4.1 and Figure A.4.2). The average scores for the examination that consists of subjects that are assumed to be covered by the common curriculum are as follows: 3-6 for natural sciences, 5-12 for basic mathematics, 10-13 for social sciences and 16-22 for Turkish out of a total of 40 questions. **These results clearly indicate that the secondary education system is performing below the expected performance level.** In other words, an examination based on a secondary education curriculum with such low average scores demonstrates that the majority of students were not able to achieve the goals set out by the curriculum and that they were not sufficiently prepared for higher education.

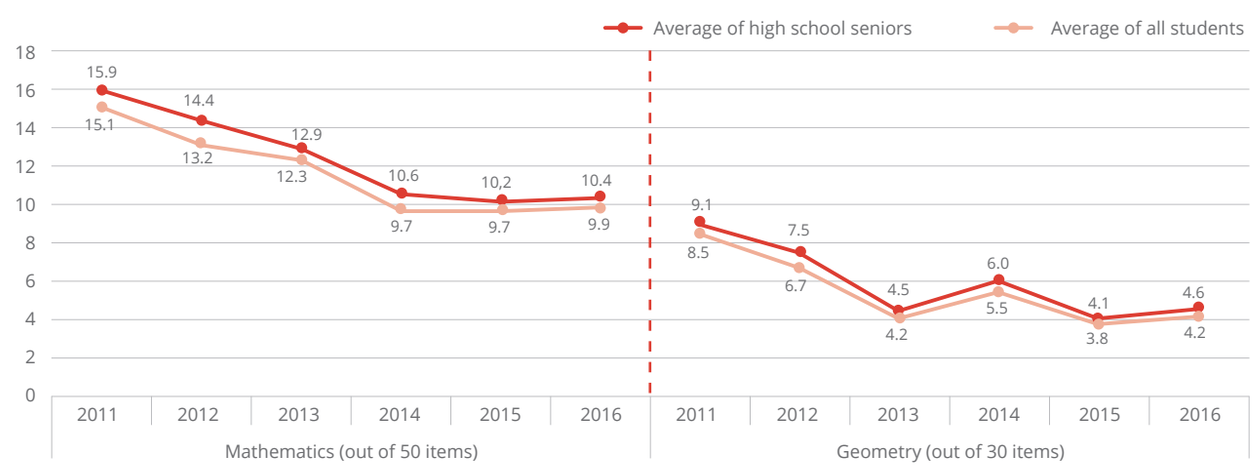
Figure A.4.2 Trends in average scores in basic mathematics and natural sciences tests in YGS (2010-2016)



Source: Compiled from YGS statistics published by ÖSYM in various years

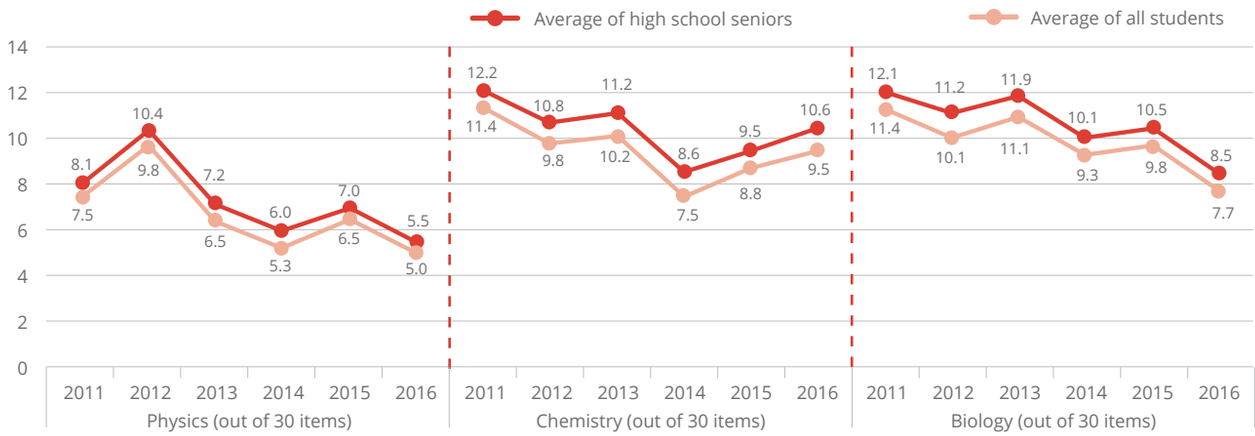
Similar to YGS, the LYS results also confirm that candidates have a low average on tests. For instance, the average test score is between 10 and 15 out of 50 questions on the mathematic test; a test that is mostly taken by students aiming for mathematics-related undergraduate programs (Figure A.4.3). For physics tests the average ranges between 5 and 7.5 out of 30 questions over the years (Figure A.4.4). On the other hand, the average score in Turkish language and literature is between 22 and 28 out of 56 questions, while the average score in Geography I ranges between 8 and 10 over the years (Figure A.4.5). Similarly, taken mostly by students aiming for liberal arts and social science departments, the average score of the 44-question history test is between 14.9 and 17.8 (Figure A.4.6). Moreover, the average score of the 80-question foreign language test (English) ranges between 20-29 (Figure A.4.7).

Figure A.4.3 Trends in average scores in mathematics and geometry tests in LYS (2011-2016)



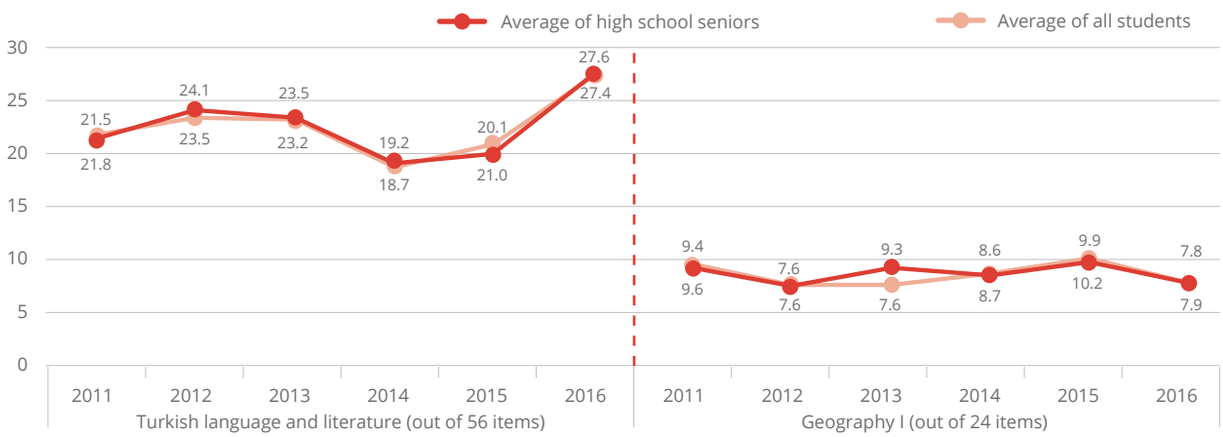
Source: Compiled from LYS statistics published by ÖSYM in various years

Figure A.4.4 Trends in average scores in physics, chemistry and biology tests in LYS (2011-2016)



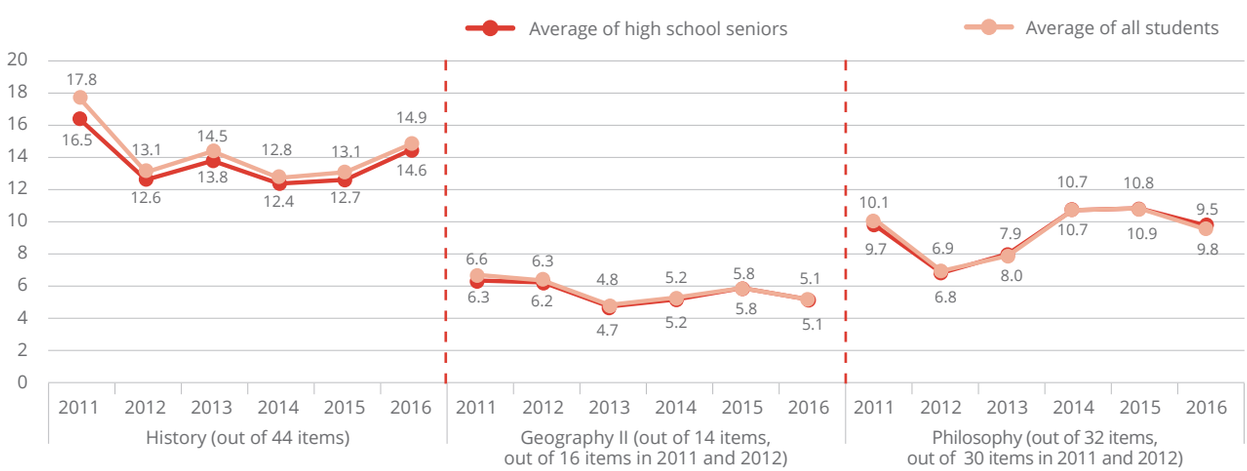
Source: Compiled from LYS statistics published by ÖSYM in various years

Figure A.4.5 Trends in average scores in Turkish language and literature and geography I tests in the LYS (2011-2016)



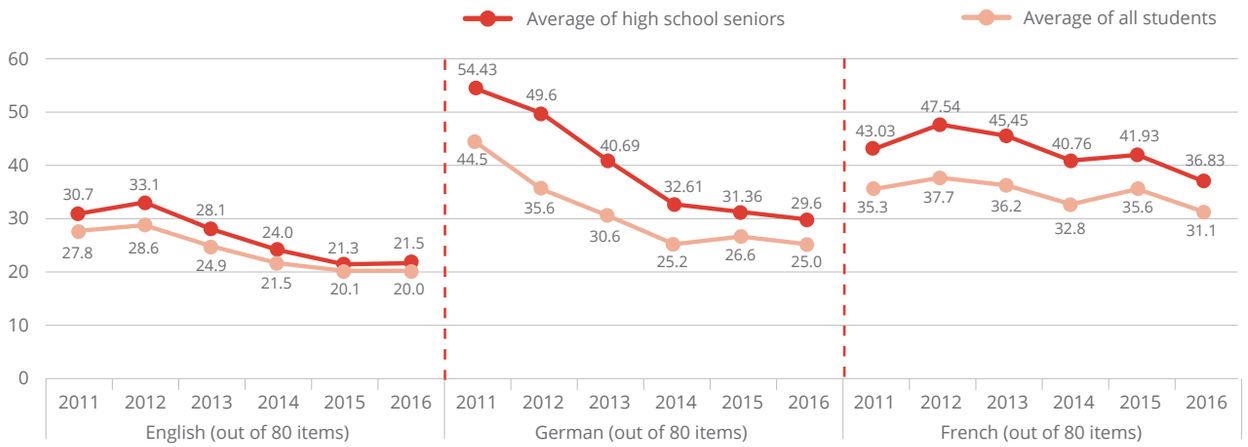
Source: Compiled from LYS statistics published by ÖSYM in various years

Figure A.4.6 Trends in average scores in history, geography II and philosophy tests in LYS (2011-2016)



Source: Compiled from LYS statistics published by ÖSYM in various years

Figure A.4.7 Trends in average scores in English, German and French tests in LYS (2011-2016)



Source: Compiled from LYS statistics published by ÖSYM in various years

In summary, students' success and readiness in the field (verbal, quantitative, etc.) that they have graduated from in their secondary education and/or want to pursue for their undergraduate studies are fairly low. Moreover, both the YGS and LYS average scores experience a sharp decline in certain years. For instance, the average scores of all students in the LYS Mathematics test declined from 15.1 to 9.9 (Figure A.4.3), the LYS Biology test scores gradually declined from 11.4 to 7.7 (Figure A.4.4) and the English test scores from 27.8 to 20 (Figure A.4.7).

INDICATOR A5

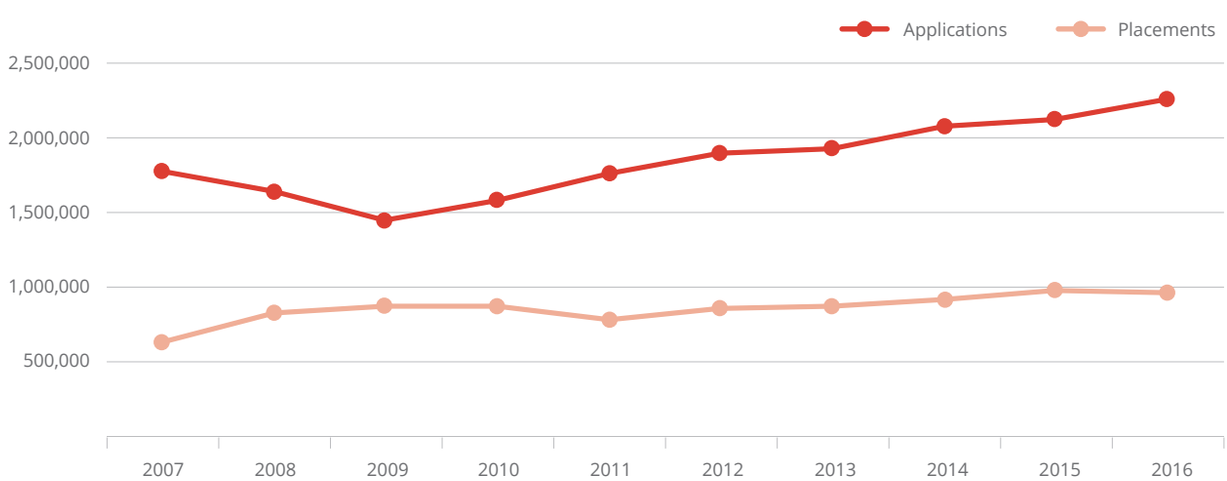
HIGHER EDUCATION QUOTAS

As previously stated, placement into higher education programs in Turkey is coordinated by ÖSYM. In this respect, quotas of higher education programs are suggested by higher education institutions to the Board of Higher Education (BHE) and are ultimately determined by BHE. The placement of candidates is realized centrally by ÖSYM taking students' scores and preferences into consideration.

Considering the number of total applications to the Student Selection and Placement System (ÖSYS) and the number of placements, it can be observed that the gap between applications and placements decreased between the years 2007 and 2009; however, the gap started to increase again after 2009 (Figure A.5.1). In other words, there is a considerable gap between applications and placements one that has been increasing since 2009. Actually, **the most essential issue of Turkey's higher education entrance system is the disparity between supply (quotas) and demand (applications)** (BHE, 2007; Çetinsaya, 2014; World Bank, 2007). Following World War II, higher education systems in other countries were increasingly popularized and became universal systems accessible to all. However, Turkey's higher education system was unable to create the capacity necessary to satisfy the demand and continued to be an elitist system until recently (Arlı, 2016; Gür, 2016a, 2016b). Nevertheless, the opening of 23 new universities in 1992 and new initiatives implemented between the years 2006-2008 with the objective of leaving no city without a university enabled Turkey's higher education to become popularized (Günay and Günay, 2011).

Looking at the higher education quotas of associate and undergraduate programs, it can be observed that the quotas for associate programs increased swiftly between the years 2008-2013, with the exception of 2011, and showed a more gradual increase thereafter (Figure A.5.2); meanwhile, quotas for undergraduate programs were increased between the 2008-2013 (Figure A.5.3). All data shows the following results: **Even though the number of applications continued to increase significantly, the quotas, especially for undergraduate programs, have very slowly increased since 2013.** On the other hand, the fact that existing associate and undergraduate program quotas have not filled up despite the prominent dispar-

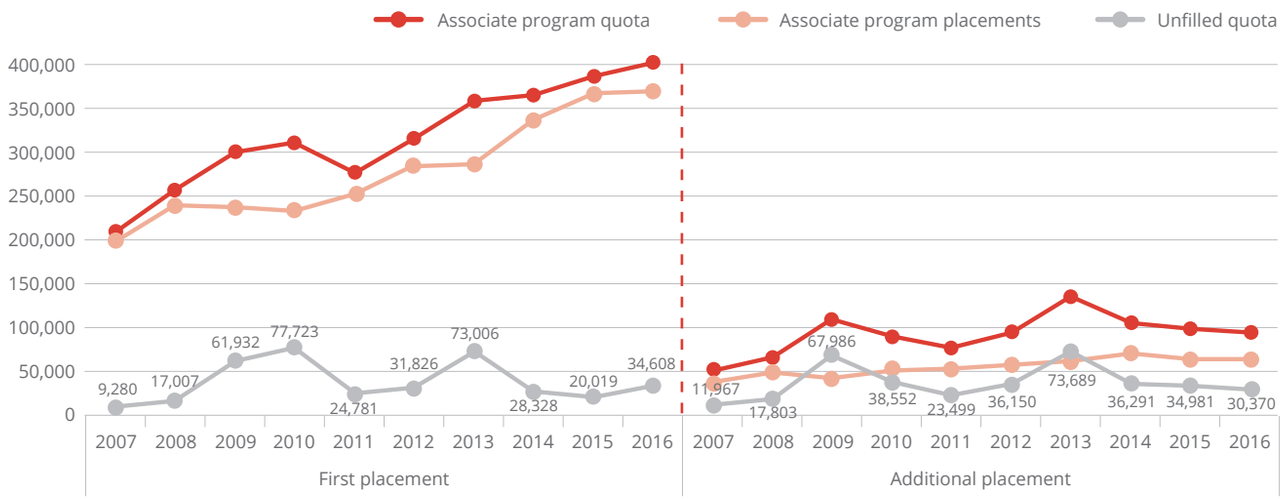
Figure A.5.1 Trends in the numbers of applications to ÖSYS and placements (2007-2016)



Source: Prepared by using ÖSYM data

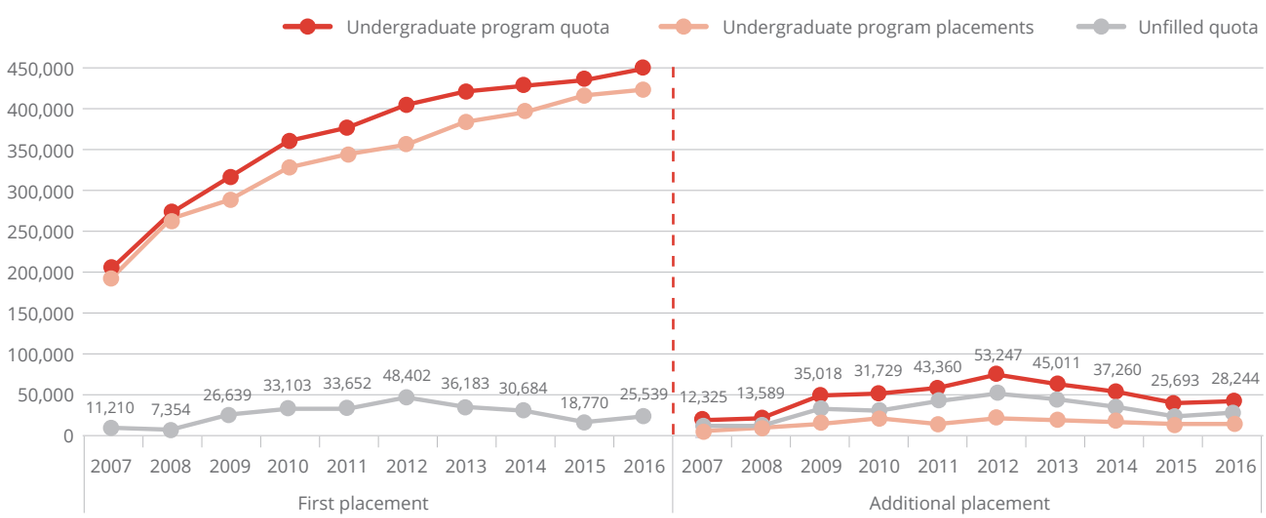
ity between the supply and demand in access to higher education is evidence of the higher education system's inefficiency. Moreover, as it will be discussed further in the following chapters, the increasing number of high school graduates and those re-entering the examination despite their initial placement into higher education program are the main factors impacting the pressure on the higher education entrance system.

Figure A.5.2 Trends in the number of quotas, placements and vacancies in associate programs (2007-2016)



Source: Compiled from ÖSYS placements and additional placement statistics published by ÖSYM in various years

Figure A.5.3 Trends in the number of quotas, placements and vacancies in undergraduate programs (2007-2016)



Source: Compiled from ÖSYS placement and additional placement statistics published by ÖSYM in various years

CHAPTER A

HIGHLIGHTS

Considering the most important factor that determines the demand for higher education being the number of secondary education graduates, **the increase in the number of students receiving a secondary education and its stabilization in the following years imply that the stress on the demand for higher education will continue to exist in the years to come**. Therefore, assessments of the higher education system's capacity or supply have to consider the fact that the stress on the demand caused by secondary education graduates will continue to persist for many more years (Kavak, 2011). Moreover, as a significant portion of students re-enter the university entrance exam because of dissatisfaction with the program they were placed in, it is understood that the parity between supply and demand cannot be realized only with quantities. It should be added that Turkey's secondary education graduate ratios are fairly low in comparison to other OECD countries; with the resolution of infrastructural issues, the devotion of more resources to compulsory education and an increase in the efficiency of compulsory education policies, it will be possible to improve the aforementioned ratios in the following years.

The second factor which determines the demand for higher education, thereby increasing the stress on the higher education entrance system, is the large number of people of who re-enter the examination even though they have already been placed into a program (Figure A.3.1). This indicates that a part of the existing higher education system is either not deemed satisfactory by applicants not meeting students expectations is deemed not satisfactory by students or does not satisfy the of them. This might be seen as a result of expanding accessibility and/or increasing prosperity. **Nevertheless, regardless of the aforementioned positive and negative assessments (the expanding accessibility on one hand and programs not being satisfactory on the other), the stress on the demand for higher education will continue to gradually increase in the years to come.** Indeed, considering that compulsory education was prolonged to 12 years (4+4+4) with a legal reform in 2012, it can be asserted that the number of high school seniors applying to the higher education entrance system will continue to increase in the following years, thus increasing the pressure on the system (Çetinsaya, 2014; Gür, 2016b).

With the foundation of new state universities between the years 2006-2008 and the increase in quotas from 2008 onwards, Turkey has adopted a swift expansion policy in the higher education sector. As a result of these policies, the parity between supply and demand was significantly improved between the 2007-2009. However, even though the demand for higher education, and thus the number of applications have increased, placement ratios decreased between 2009 and 2016. **This situation indicates that the above average placement ratio achieved between the years 2007-2009 has since been lost and that the disparity between the supply and the demand within the higher education entrance system has not been resolved despite the foundation of new universities and the increase in quotas.** In summary, despite the increase in quotas and the foundation of new universities, the majority of ÖSYS applicants cannot be placed (Figure A.5.1). Furthermore, the expansion policy has since been renounced and the BHE has ad-

opted a discourse that favours quality over quantity and indicates that further expansion is not preferred. Yet, it is clear that the existing higher education system is unable to satisfy the demand for higher education; therefore, it is hazardous to adopt a discourse and associated policy that only favours quality by disregarding the demand.

As it currently stands, it cannot be said that Turkey, which has a young population, is implementing a quota and expansion policy that will address the issue of an increasing demand for higher education. Thus, it is estimated that the disparity between the supply and demand will continue to increase as long as the current policies are pursued. The continuation of the disparity between supply and demand means that the young population will continue to focus on the university entrance system for years, which means that the demographic window of opportunity is not being utilized to its fullest extent. This situation clearly demonstrates that current policies need to be revised.

Looking at the average success levels of secondary education graduates in the university entrance exams, it can be seen that their levels of success in the field they have graduated from and/or want to study in as undergraduates along with their preparedness for higher education are fairly low. Moreover, there are sharp declines in the average scores of certain tests over the years.

Even though there are hundreds of thousands of candidates who applied to ÖSYS but could not be placed, tens of thousands of quotas remain unfilled which indicates a lack of efficient guidance or that the existing quotas do not satisfy the contemporary demands. In this respect, it should be expressed that a significant portion of the existing quotas remaining unfilled is the result of students having reservations regarding the quality of education and the employment prospects of the programs provided by higher education institutions.

.

CHAPTER A

RECOMMENDATIONS

- As Turkey's secondary education schooling rates are both lower than the average of OECD countries and fall short of the mark as a result of compulsory education being prolonged to 12 years with the 4+4+4 system, the Ministry of National Education (MONE) needs to take more measures in order to improve the secondary education schooling rates. In this respect, the ministry of education should take the necessary precautions to prevent dropouts that occur both in the transition from primary to secondary education and during secondary education along with combating absenteeism. In terms of gender distributions, the continuous increase in favour of female students should be observed closely and more measures should be taken to improve gender distribution.
- **MONE should investigate the reasons behind low success rates in university entrance exams that are based on the secondary education curriculum and precautions should be taken to enable students to graduate from secondary education more equipped to continue their studies.** Moreover, the cause of declining success rates in certain tests of the university entrance exams must be thoroughly investigated. Whether these declines are related to the level of difficulty of the questions prepared by ÖSYM or to the changes in secondary education policies (e.g. high school education being prolonged to 4 years and the extension of compulsory education) must be examined.
- Considering that the stress on the higher education entrance system will increase in the years to follow, **both the capacity and the quality of the higher education system must be improved through policies** that help manage the expected disparity between the supply and demand. As there are vacancies in certain programs despite the high demand for higher education, both the higher education institutions' program opening processes and the BHE's program approval processes must be revised. In order to satisfy the democratic demand for higher education accessibility, both the higher education institutions and the BHE should take this demand into consideration and should continue to expand the higher education system.

CHAPTER A

REFERENCES

Arlı, A. (2016). Yükseköğretimde büyüme, farklılaşma ve reorganizasyon: Istanbul örneği (1980-2015) [Growth, diversification and reorganization in higher education: The Istanbul case (1980-2015)]. *Sosyoloji Konferansları*, (54), 199–243.

BHE. [YÖK] (2007). *Türkiye'nin yükseköğretim stratejisi* [Turkey's higher education strategy]. Ankara: Yükseköğretim Kurulu.

Bulut, S., Gür, B. S., & Sriraman, B. (2010). Commentary 2 on feminist pedagogy and mathematics. In B. Sriraman & L. English (Ed.), *Theories of mathematics education: Seeking new frontiers* (pp. 455–466). New York: Springer.

Çelik, Z. (2015). Ortaöğretime ve yükseköğretime geçiş sınavları kıskacında ortaöğretim sistemi. [Secondary education in between the transition to secondary and higher education examinations] In A. Gümüş (Ed.), *Türkiye'de eğitim politikaları* (pp. 273–296). Ilem Kitaplığı & Nobel.

Çetinsaya, G. (2014). *Büyüme, kalite, uluslararasılaşma: Türkiye yükseköğretimi için bir yol haritası* [Growth, quality and internationalization: A road map for Turkey's higher education]. Eskişehir: Yükseköğretim Kurulu.

EARGED. (2005). *PISA 2003 projesi ulusal nihai rapor* [PISA 2003 Project Final National Report]. Ankara: Milli Eğitim Bakanlığı Eğitimi Araştırma ve Geliştirme Dairesi Başkanlığı.

Eğitim-Bir-Sen. (2016). *Eğitime bakış 2016: İzleme ve değerlendirme raporu* [Outlook on Education 2016: Monitoring and evaluation report]. Ankara: Eğitimciler Birliği Sendikası.

Günay, D., & Günay, A. (2011). 1933'ten günümüze Türk yükseköğretiminde niceliksel gelişmeler [Quantitative developments in Turkish higher education 1933 onwards]. *Yükseköğretim ve Bilim Dergisi*, 1(1), 1–22.

Gür, B. S. (2016a). *Democratization and massification of higher education in Turkey and challenges ahead.* (Research & Occasional Paper Series No. CSHE.3.16). Berkeley, CA: University of California, Berkeley. http://www.cshe.berkeley.edu/publications/democratization-and-massification-higher-education-turkey-and-challenges-ahead

Gür, B. S. (2016b). *Egemen üniversite: Amerika'da yükseköğretim sistemi ve Türkiye için reform önerileri* [The dominant university: Higher education system in the US and reform suggestions for Turkey]. Istanbul: EDAM.

Gür, B. S., & Çelik, Z. (2009). *Türkiye'de millî eğitim sistemi: Yapısal sorunlar ve öneriler* (Rapor No. 1) [Turkey's national education system: Structural issues and Recommendations (Report No. 1)]. Ankara: Siyaset, Ekonomi ve Toplum Araştırmaları Vakfı.

Gür, B. S., Çelik, Z., & Coşkun, I. (2013). *Türkiye'de ortaöğretimin geleceği: Hiyerarşi mi, eşitlik mi?* (Analiz No. 69) [Future of Turkey's secondary education: Hierarchy or equality? (Analysis No. 69)]. Ankara: Siyaset, Ekonomi ve Toplum Araştırmaları Vakfı.

Helms, R. M. (2008). *University admission worldwide*. Washington, DC: The World Bank.

Kavak, Y. (2011). Türkiye'de yükseköğretimde büyüme: Yakın geçmişe bakış ve uzun vadeli (2010-2050) büyüme projeksiyonları [Growth in Turkey's higher education: A look the recent past and long-term growth projections (2010-2050)]. *Yükseköğretim Dergisi*, 1 (2), 95–102.

MONE. (2013). *PISA 2012 ulusal ön raporu* [PISA 2012 National preliminary report]. Ankara: Milli Eğitim Bakanlığı Yenilik ve Eğitim Teknolojileri Genel Müdürlüğü.

MONE. (2016). *Milli eğitim istatistikleri: Örgün eğitim 2015-2016* [National education statistics: formal education 2015-2016]. Ankara: Milli Eğitim Bakanlığı.

MONE. (2017). *Milli eğitim istatistikleri: Örgün eğitim 2016-2017* [National education statistics: formal education 2016-2017]. Ankara: Milli Eğitim Bakanlığı.

OECD. (2016). *Education at a glance 2016: OECD indicators*. Paris: Organisation for Economic Co-operation and Development.

OECD. (2017). *The state of higher education 2015-16*. Paris: Organisation for Economic Co-operation and Development.

ÖSYM. (2017). 2017-YGS sayısal bilgiler [2017-YGS quantitative information]. http://dokuman.osym.gov.tr/pdfdokuman/2017/OSYS/YGS/SAYISAL28032017.pdf

Özer, M., Çavuşoğlu, A., & Gür, B. S. (2011). Restorasyon ve toparlanma dönemi: Mesleki ve teknik eğitimde 2000'li yıllar [Restoration and reconstruction era: Vocational and technical education in 2000s]. In B. S. Gür (Ed.), *2000'li yıllar: Türkiye'de eğitim* (pp. 163–192). Istanbul: Meydan.

Polat, S. (2014). *Türkiye'nin 2023 vizyonu ve eğitimde "orta kalite" tuzağı* [Turkey's 2023 vision and "average quality" trap in education]. Ankara: Siyaset, Ekonomi ve Toplum Araştırmaları Vakfı.

UNESCO. (2017). UNESCO Institute for Statistics. http://uis.unesco.org/

World Bank. (2007). *Turkey: higher education policy study, volume 1. Strategic directions for higher education in Turkey*. Washington, DC: The World Bank.

World Bank. (2013). *Promoting excellence in Turkey's schools* (No. 77722). Washington, DC: The World Bank.

CHAPTER B

ACCESS TO AND PARTICIPATION IN HIGHER EDUCATION

Traditionally in many countries the privileged sections of society would benefit from higher education while the other segments of society could not adequately benefit from it. However, higher education access and participation increased alongside primary education participation rates. Access to higher education constitutes a fundamental dimension of the relationship between society and higher education systems (Çetinsaya, 2014). Following the Second World War, especially in western European countries and countries such as the United States, access to higher education was extended around the world and higher education became popularized. Due to an increasing demand from citizens as well as the requirements of modern society and the economy higher education systems have expanded overtime. With the popularization of higher education, student bodies have become more heterogeneous, women's participation increased, the average age of students increased and more individuals from different layers of society and minority groups have been enabled to access higher education (Altbach, 2007; OECD, 2016). While many Western countries popularized higher education to the furthest extent following the Second World War, a very elitist understanding of university was adopted in Turkey during this same period and as a consequence the popularization of higher education was severely neglected (Çetinsaya 2014; Gür, 2016). However, the expansion rate of higher education eventually increased beginning in the 1980s and popularization improved significantly in the 1990s and 2000s. As in the case of other countries, issues such as the better financing of higher education, ensuring quality, and the increase in competition within the labour market due to the surge in graduates all became prominent topics of discussion (OECD, 2017).

In this chapter, the changes in the number of students receiving a higher education will be discussed. Within this framework the total number of students, schooling and gender ratios, the number of international students, disabled students, exchange program participant students will be examined according to education levels (associate's, bachelor's, graduate) and education types (face-to-face, evening education, open education, distance education).

It will be useful to provide beforehand the definitions of the terms that will be used frequently throughout this chapter in the context of higher education access and participation. Schooling rates are one of the most important indicators of participation in higher education. The **gross schooling rate** is calculated by dividing the number of students at a particular education level by the total population expected to receive an education at that level and multiplying the resultant number by 100. In general, for the purpose of calculations regarding the higher education level the population considered is limited to the 18-22 age interval. A high gross schooling rate indicates that the capacity of the education system and the participation rates are high. However, some students could be below the age of 18 or over 22. Therefore, even if the gross schooling rate approaches 100% all this indicates for certain is that the education system has the capacity to accommodate the theoretical 18-22 year old portion of the population, while proving insufficient in providing t the adequate schooling rate for this particular population. Hence, in order to determine the higher education participation rate of this age population, we need to calculate the net schooling rates. The **net schooling rate** for higher education is calculated by dividing the number of higher education students within the 18-22 age interval by the total population of the 18-22 age group and multiplying the resultant number by 100.

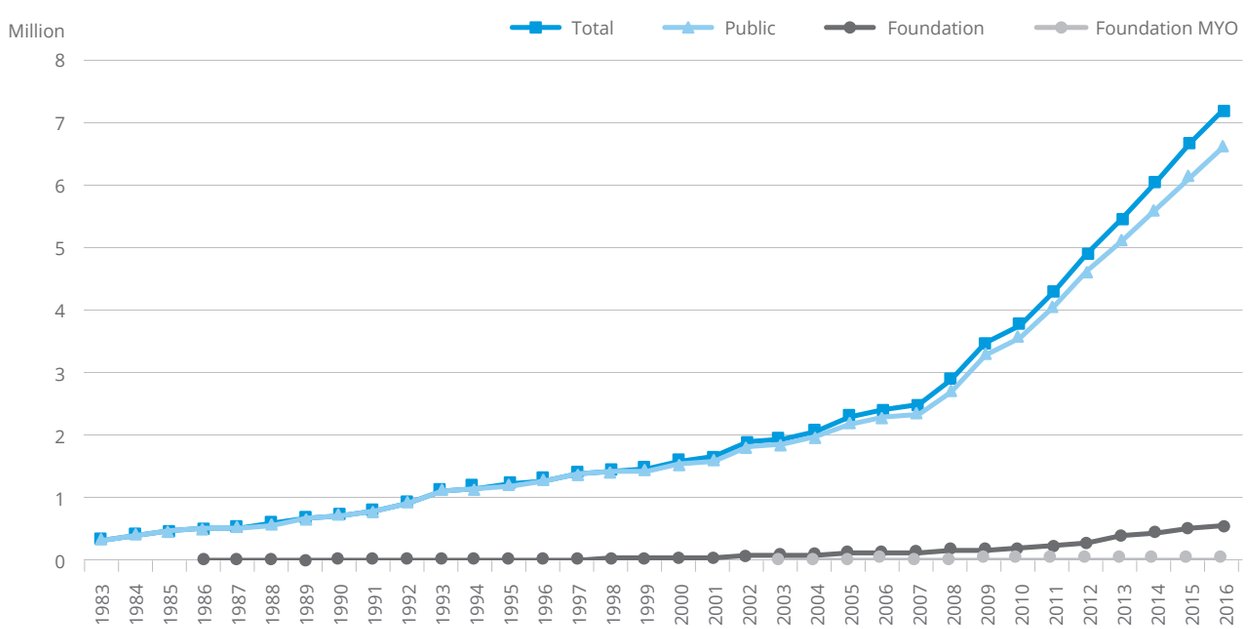
INDICATOR B1

NUMBER OF STUDENTS

In this indicator, in order to shed light on both the Board of Higher Education (BHE) period (1983-2016) and on the developments in higher education over the last 10 years, the total number of students and the number of new enrolments have been examined extensively according to education level and gender.

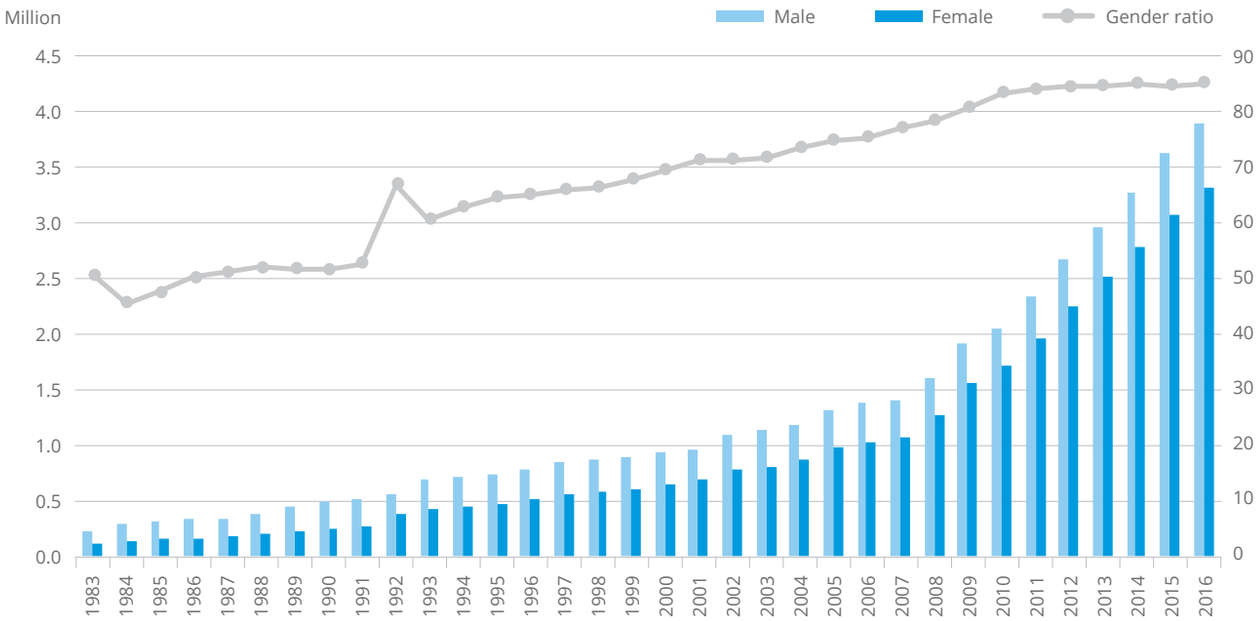
Figure B.1.1 shows the trends in the number of students by higher education institution type between 1983 and 2016. According to the figure the higher education system continued to grow throughout these years. **While the total number of students was around 335 thousand in 1983, this number grew more than 20 times reaching 7,198,887 in 2016. According to UNESCO (2017) data the Turkish higher education system has become the largest in Europe in terms of the total number of students.** The increase in the total number of students is mainly due to public universities. This public university induced increase can be reviewed in two stages. Between 1983 and 2007 the growth rate was relatively more conservative. However, starting in 2008 there was more rapid growth. In both these stages the driving force of growth was public universities. The new capacity generated by the establishment of new public universities from 2005 onward and the increase in quotas of old public universities fuelled a much more rapid growth from 2007 onward (Günay and Günay, 2011). Factors such as student amnesties, the abolishment of expulsion, and public universities becoming tuition-free also played a role in this growth. In addition to this, the number of students in foundation universities grew from 139 thousand in 2007 to over 554 thousand in 2016 which is significant. Indeed, as we will discuss later on, excluding open education the share of foundation universities, among associate degree and bachelor's degree programs has reached 15% (see Figure B.3.4). As of 2016 the total number of students in foundation postsecondary vocational schools (MYOs) has remained under 20 thousand representing a relatively small share of the higher education system.

Figure B.1.1 Trends in the total number of students according to higher education institution type (1983-2016)



Source: Compiled using the data from the Higher Education Information Management System and the Measuring, Selection and Placement Centre (ÖSYM)

Figure B.1.2 Trends in the total number of students by gender and the trends in gender ratios (1983-2016)

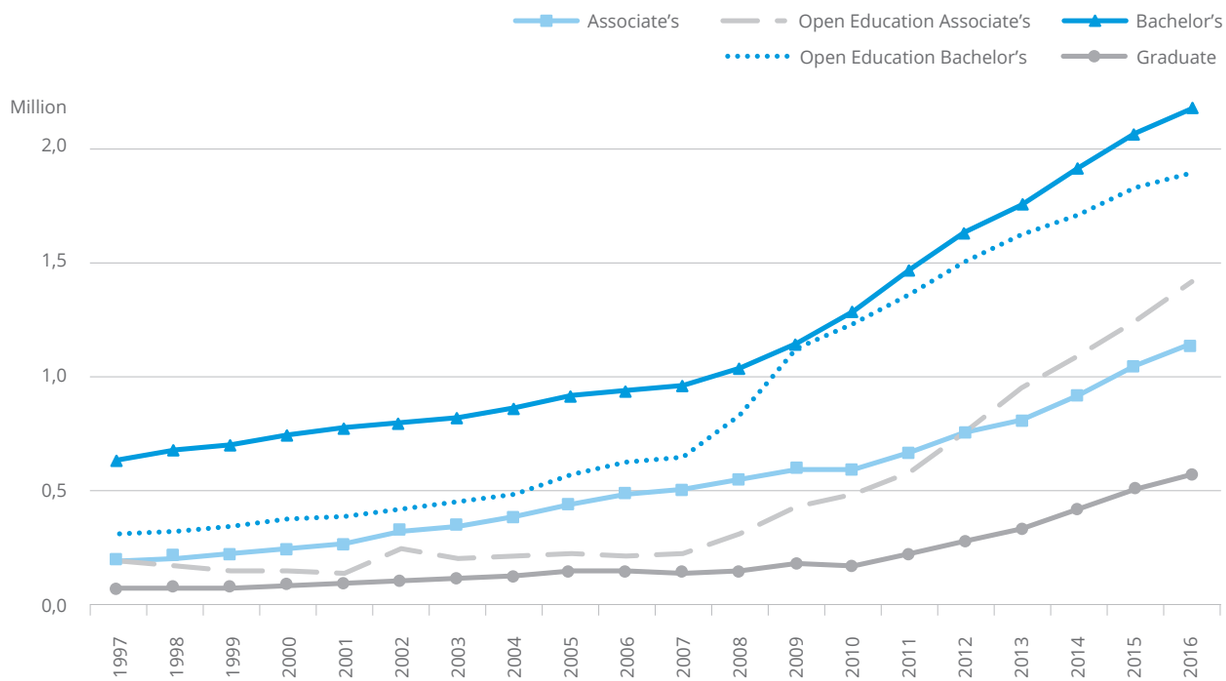


Source: Compiled using the data from the Higher Education Information Management System and the Measuring, Selection and Placement Centre (ÖSYM)
Note: The number of students includes all associate's degrees, bachelor's degree, master's degree, and doctoral students

Figure B.1.2 presents the trends in the total number of students by gender and the trends in gender ratios between 1983 and 2016. Between these years the number of male students has consistently been higher than female students. However, over the years the gender ratio has changed in favour of female students. **While the gender ratio was 50,6 in 1983, it rose to 67 in 1992 and increased to 85,2 in 2016.** In other words, while there were about 10 female students for every 20 male students at the beginning of the 1980s, at the end of the 1990s, there were 13 female students for every 20 male students, and since 2010 this number has risen to 17 female students for every 20 male students. **Although over the years the disparity between the number of female and male students has decreased significantly, the disparity persists.** However, as it will be indicated later on, the disparity between net schooling rates for males and females between the ages of 18 and 22 has been eliminated. Furthermore, female schooling rates have surpassed male schooling rates (see Figure B.2.2). As a matter of fact, according to 2015 data for bachelor's programs, female students have a much higher graduation rate than male students (118 female students to 100 male students) (see Figure C.2.2). Due to the increase in accessibility of higher education, particularly from 2008 onward, there has been significant improvement towards achieving parity in female and male schooling rates.

Figure B.1.3 presents the total number of students according to education level (associate's, bachelor's and graduate) and education type (face-to-face and open education) between 1997 and 2016. These figures enable us to better understand the source of growth in the higher education system by education level and education type. The figures show that a steady increase has been achieved at the associate's, bachelor's, graduate education levels and also across all education types (face-to-face and open education). However, there has been a more rapid increase in the number of students at the bachelor's level especially following 2008. It makes sense that the number of bachelor's students increased at a period in which new public universities were being established and quotas were substantially increased. However, the interesting development here is that the number of bachelor's students in open ed-

Figure B.1.3 Trends in the total number of students according to education level and education type (1997-2016)



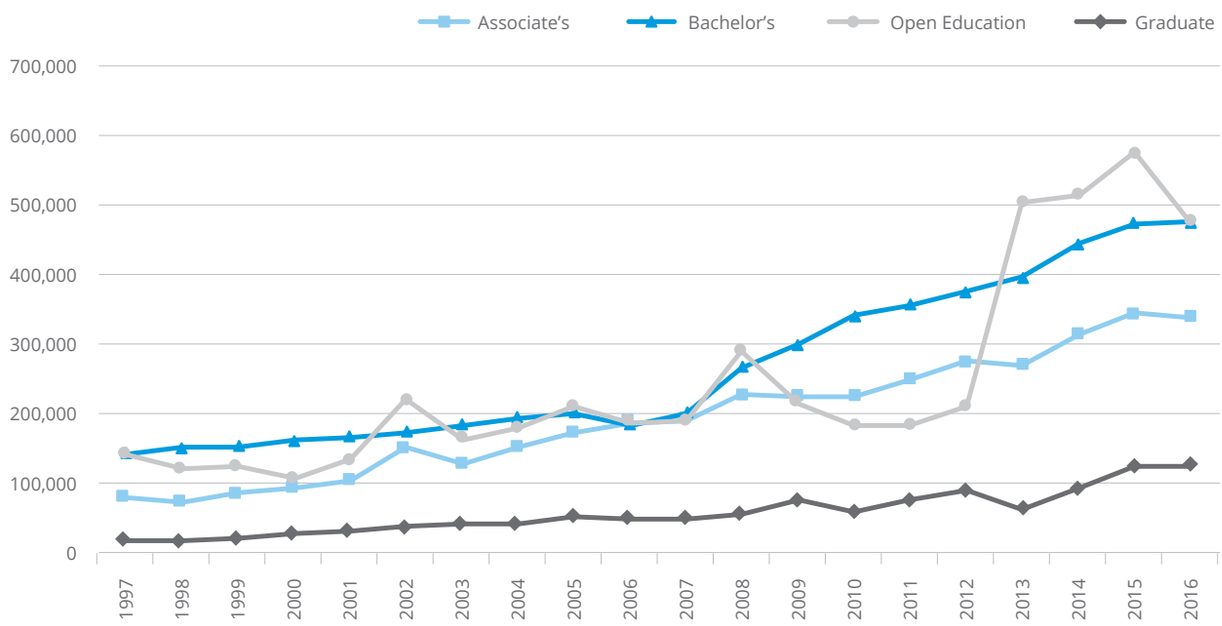
Source: Compiled using the data from the Higher Education Information Management System and the Measuring, Selection and Placement Centre (ÖSYM).

ucation increased much more than the number of bachelor's students receiving a face-to -face education. **In other words, despite the establishment of new universities, the open education system has become larger instead of becoming smaller.** The open education system which was initially established and expanded because the higher education system lacked adequate capacity has continued to grow in a period in which the higher education system as a whole has also grown relatively and generated new capacity. As will be further discussed later on, the primary reason for this is that as of 2017 no measure has been taken to reduce the size of the open education system which has reached half the size of the entire higher education system (see **Indicator B.6 Open and Distance Education**).

Figure B.1.4 shows the trends in the number of newly enrolled students according to education level and education type between 1997 and 2016. The number of newly enrolled students in associate's, bachelor's and graduate programs has generally tended to increase, although it has declined in certain years. A total of around 225 thousand students, of which 83 thousand were associate's, 123 thousand were bachelor's and 19 thousand were graduates, enrolled in face-to- face programs in 1997. In 2016 a total of 954 thousand students, 348 thousand of which were associate's, 479 thousand were bachelor's and 127 thousand were graduates, enrolled in face-to-ace higher education programs. New enrolments in open education programs were 145 thousand in 1997 but starting from 2013 this number surpassed five hundred thousand and in 2016 reached four hundred and eighty-one thousand. **It is interesting that the number of new enrolments in open education is so high despite the fact that face-to-face education opportunities in both public and foundation universities have expanded due to the establishment of new higher education institutions.**

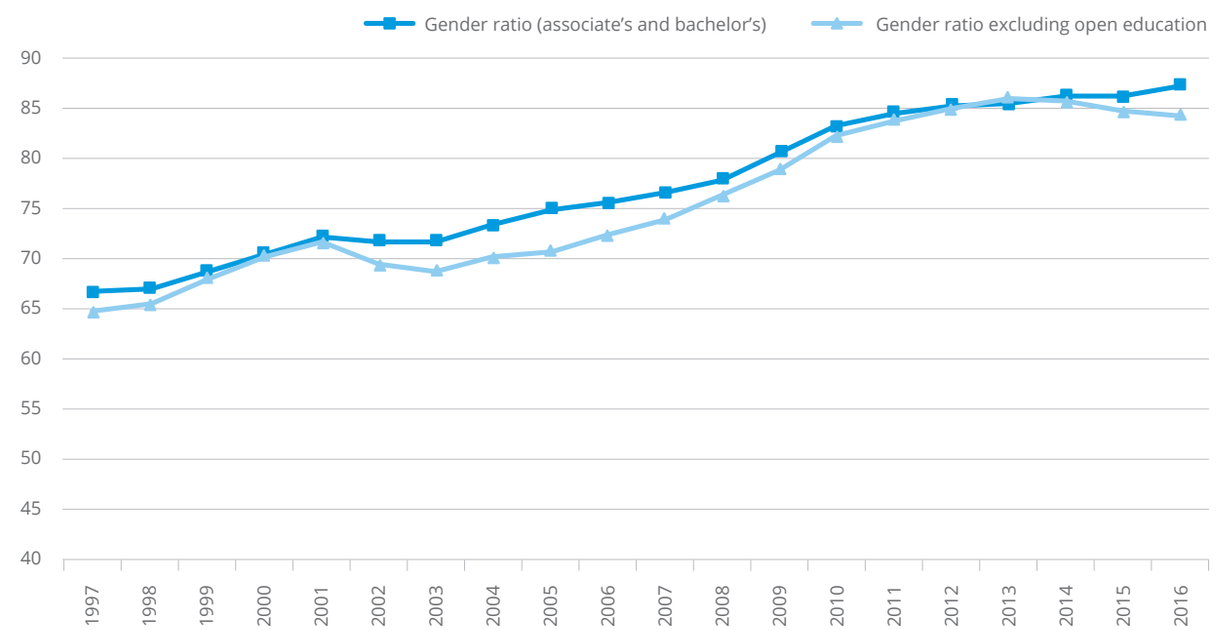
Figure B.1.5 shows the trends in the gender ratio according to education level and education type between the years 1997 and 2016. **When associates and bachelors programs are considered together including or excluding open education gender ratios have improved significantly over this period.** However, the number of female students still has not caught up with the number

Figure B.1.4 Trends in the number of new entrants according to education level and education type (1997-2016).



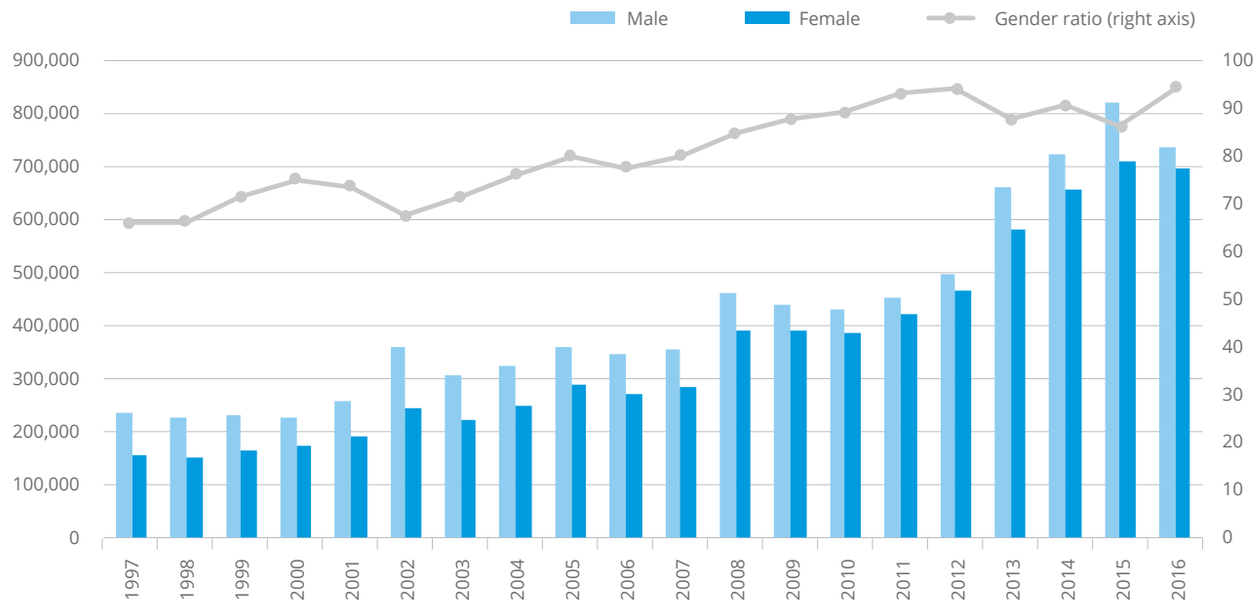
Source: Compiled using the data from the Higher Education Information Management System and the Measuring, Selection and Placement Centre (ÖSYM).

Figure B.1.5 Trends in the student gender ratios according to education level and education type (1997-2016)



Source: Compiled using the data from the Higher Education Information Management System and the Measuring, Selection and Placement Centre (ÖSYM).

Figure B.1.6 Trends in the number of newly enrolled students by gender and the trends in gender ratios (1997-2016)



Source: Compiled using the data from the Higher Education Information Management System and the Measuring, Selection and Placement Centre (ÖSYM).

of male students in higher education. While in 1997 the gender ratio was 65 excluding open education and 67 including open education, the numbers have increased to 84 and 87, respectively, in 2016. In other words, while there were 65-67 female students for every 100 male students in 1997, these numbers increased to 84-87 female students in 2016. Gender ratios improve when open education is included. Although this shows that open education has some benefits such as its contribution to the increase in the schooling rate of female students, it also shows that measures should be taken to increase female student ratios in face-to-face programs. According to 2015 data, for every 100 male students 118 female students graduate from a bachelor's program and 93 from an associate's degree program (see Figure C.2.3). This shows that the higher ratio of male students in the higher education system is impacted by the fact that male students stay in the system longer.

Figure B.1.6 shows the trends in the number of newly enrolled students by gender and the trends in gender ratios. These numbers include all education levels and types (open education and face- to-face). The number of newly enrolled female and male students generally tended to increase during the 1997 to 2016 period. **However, during these years the number of newly enrolled male students is higher than the number of newly enrolled female students.** Nevertheless, when the gender ratio is considered, there is an increase from 66 to 95 with small fluctuations. **While 66 female students enrolled for every 100 male students in 1997, 95 new female students enrolled for every 100 newly enrolled male students in 2016.** However, as it can be seen from the fluctuations between 2013 and 2015, it would be hard to say that an equilibrium has been reached in the rates of new enrolments.

INDICATOR B2

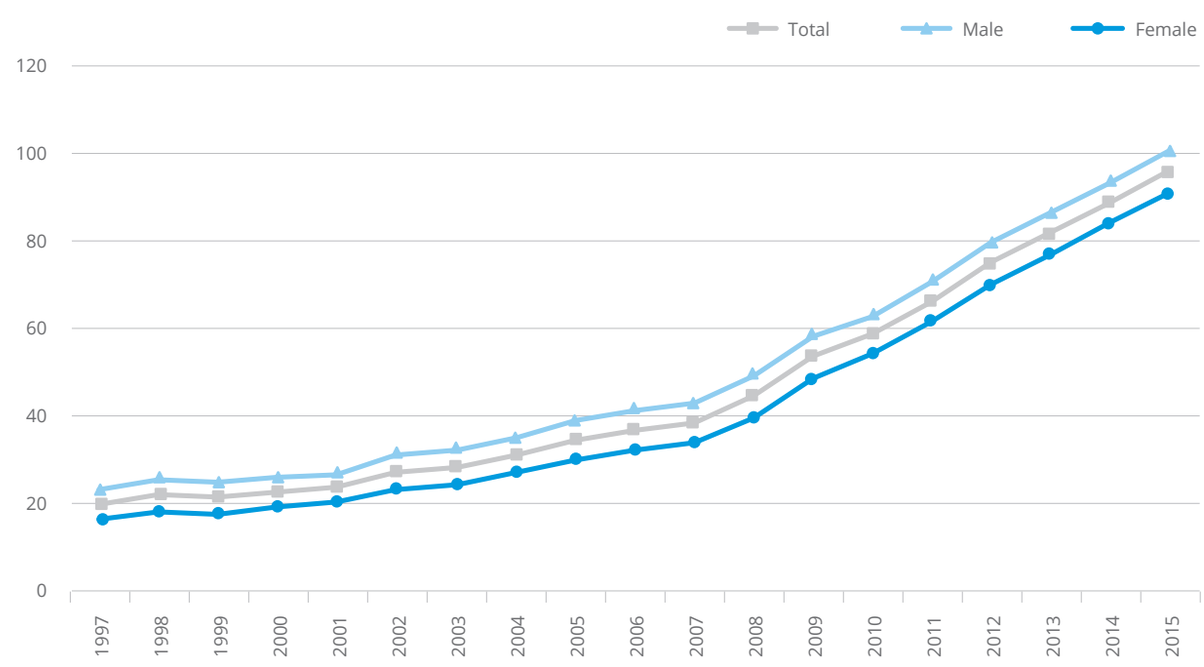
SCHOOLING RATES

In this indicator the trends in gross and net schooling rates by gender will be discussed and subsequently the gross schooling rates in Turkey will be compared with a select set of countries. As previously indicated, **the gross schooling rate** is calculated by dividing the total number of students receiving a higher education by the total population within the 18-22 age group and later multiplying the result by 100. **The net schooling rate** in higher education is calculated by dividing the total number of students in the 18-22 age group by the total population within the 18-22 age group and multiplying the result by 100.

Figure B.2.1 shows the trends in the higher education gross schooling rates by gender between 1997 and 2015.

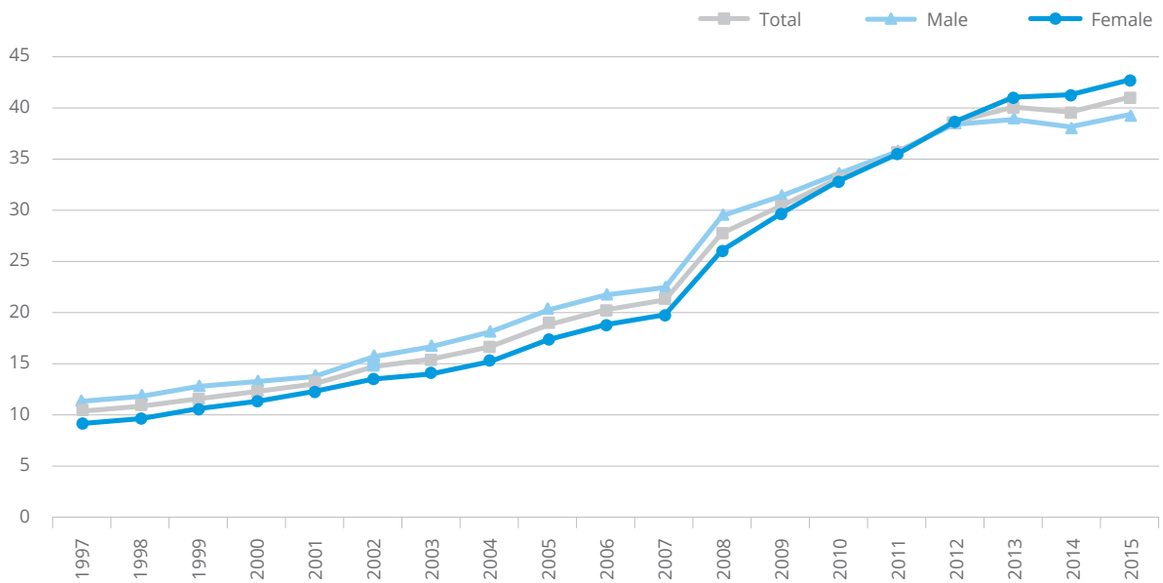
Between the years 1997 and 2015 there was a significant and generally steady increase in the higher education schooling rates of male and female students. While the gross schooling rate for males was 22.9% in 1997, this rate increased more than three times and reached 100.6% in 2015. These increases indicate that opportunities to access higher education increased for both female and male students, although the schooling rates for females are still lower than males. However, these rates show the participation of all age groups in both open education and face-to-face education programs. Therefore, in order to determine the extent to which the higher education system serves the 18-22 age group in particularly, it would be useful to look at the net schooling rates (see Figure B.2.2).

Figure B.2.1 Trends in the higher education gross schooling rates by gender (%) (1997-2015)



Source: Compiled using MONE statistics published in various years.

Figure B.2.2 Trends in higher education net schooling rates by gender (%) (1997-2015)

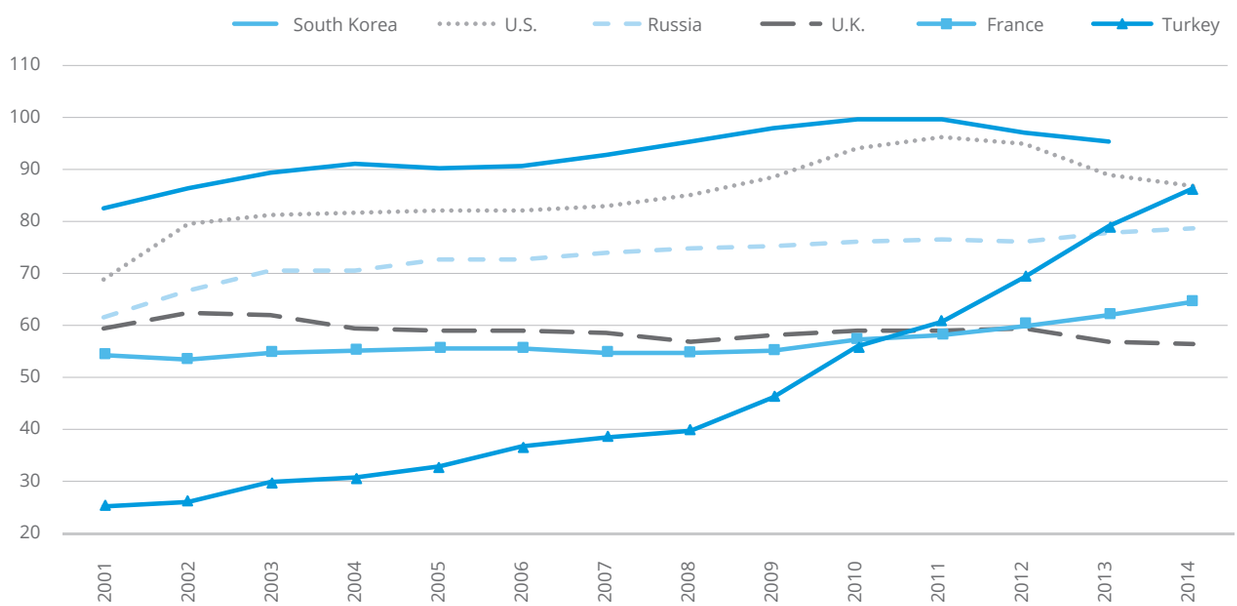


Source: Compiled using MONE statistics published in various years.

Figure B.2.2 shows trends in net higher education schooling rates by gender between 1997 and 2015. **There has been a very substantial increase in the schooling rates of females and males in the 18-22 age group between the years 1997 and 2015.** While the net schooling rates for males were 11.3% and for females 9.2%, these rates quadrupled to 39.2% for males and %42.6 for females. Another important point that stands out during this period is that in 2011 female schooling rates caught up with male schooling rates and net female schooling rates actually surpassed the net male schooling rates beginning in 2012. **In current day Turkey females in the 18-22 age group participate in higher education in higher rates than males in the same age group.** When taken together with the finding that gross male schooling rates are higher than gross female schooling rates, it can be assumed that males tend to start university relatively later and generally their higher education is prolonged by military service and/or not making satisfactory progress towards graduation.

Figure B.2.3 shows the trends in gross schooling rates in different countries between the years 2001 and 2014. Countries like South Korea, the U.S, Russia, the U.K and France surpassed the 50% level for higher education schooling rates much earlier than Turkey. Turkey was only able to reach this level in the 2010s following the growth from 2008 onwards which enabled rapid growth ever since. However, these figures should be interpreted in a careful manner because they include open education. When it is factored in that in recent years almost half of higher education students are receiving an open education (see **Indicator B.6 Open and Distance Education**), it is revealed that Turkey's gross schooling rate excluding open education is half of what is indicated in the figure. Therefore, when open education is excluded Turkey's gross schooling rates are much lower than the U.S, South Korea and Russia.

Figure B.2.3 Trends in gross schooling rates of selected countries (2001-2014)



Source: Compiled using UNESCO data.

INDICATOR B3

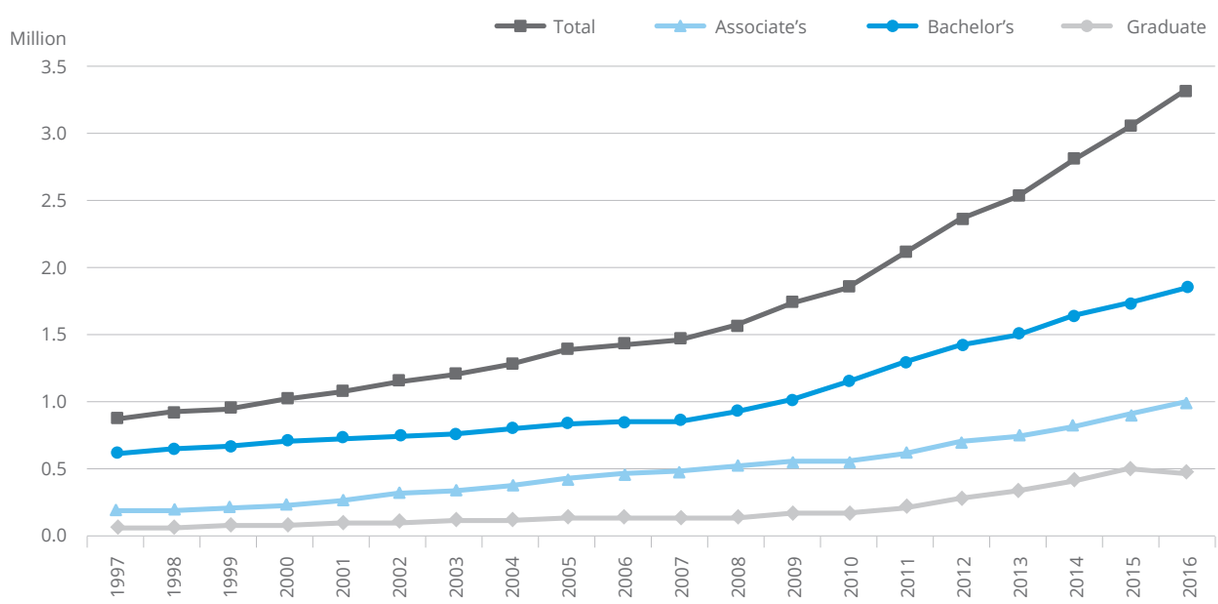
PUBLIC and FOUNDATION HIGHER EDUCATION INSTITUTIONS

In this indicator the trends in the number of students in public and foundation universities and foundation post-secondary vocational schools (MYOs) will be reviewed.

Figure B.3.1 presents the trends in the total number of students in public universities according to education level between 1997 and 2016. **During these years (excluding open education) the total number of students has increased from 874 thousand to 3 million 323 thousand in a twenty-year period.** Student numbers have increased steadily at the associate's, bachelor's and graduate levels. As it has been pointed out before, the number of students particularly at the associate's and bachelor's level have increased more rapidly since 2008 and these numbers reached 996 thousand and 1 million 851 thousand, respectively. However, although the number of graduate students has experienced a slight increase since 2011, this increase has been relatively more modest compared to other levels. Moreover, the total number of graduate students has fallen from 503 thousand in 2015 to 476 thousand in 2016. Furthermore, as we will discuss later on, the total schooling rates including Turkey's public and foundation universities at the graduate level and especially at the doctoral level are much lower compared to other OECD countries (see **Indicator B.7. Graduate Education**)

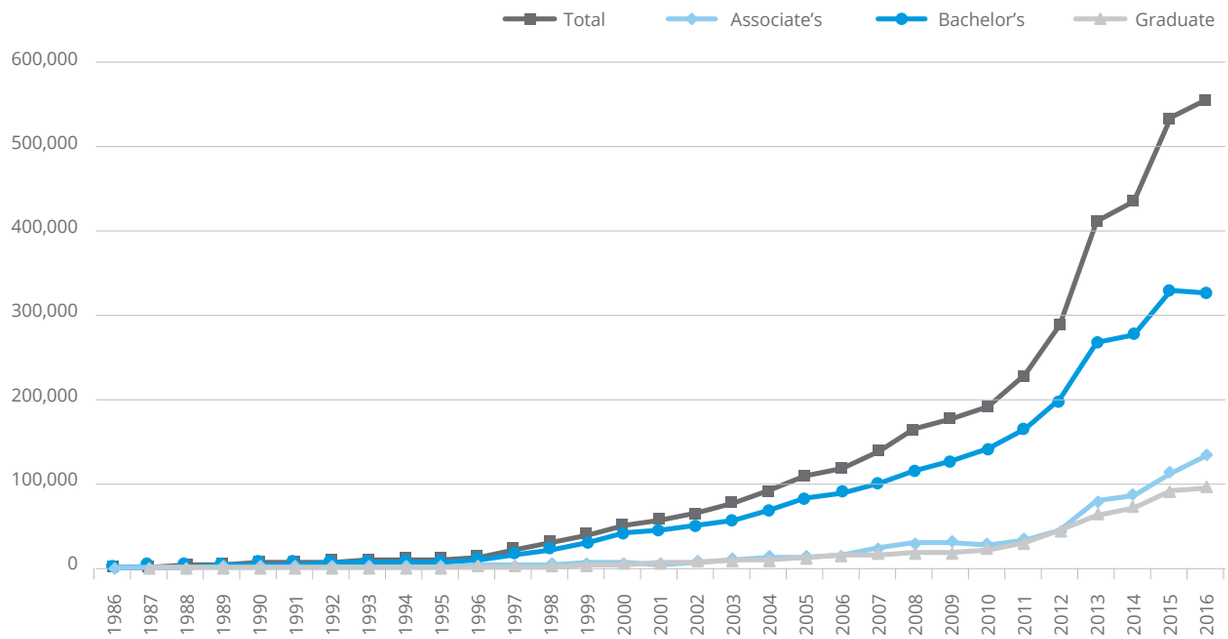
Figure B.3.2 shows the trends in the total number of students in foundation universities according to education level between 1986 and 2016. In 2005, following the 20-year period after the establishment of the first foundation university, the total number of students in foundation programs reached 108 thousand and then reached 553 thousand at the end of 2016. **The driving force behind this increase is the increase in the total number of students at the bachelor's level.** The increases at both the associate's and the graduate level have been more modest compared to the increase at the bachelor's level. The

Figure B.3.1 Trends in the total number of students in public universities according to education level (1997-2016)



Source: Compiled using Higher Education Information Management system and ÖSYM data.
Note: Open education students were not included in the calculations.

Figure B.3.2 Trends in the total number of students in foundation universities according to education level (1986-2016)

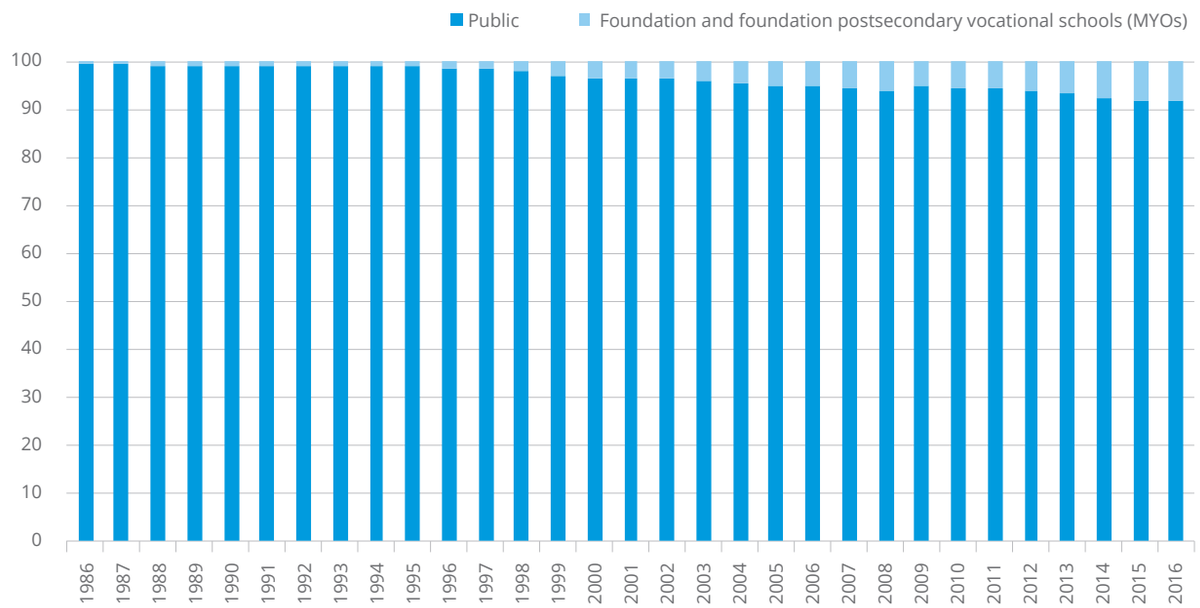


Source: Compiled using Higher Education Information Management system and ÖSYM data.

main reason for this is that since foundation universities have higher tuition fees, students prefer to enrol in these institutions at the bachelor's level. The total number of students studying in foundation higher education institutions has increased substantially, especially between 2010 and 2015. However, the increase in 2016 (the 2016-2017 academic year) has been quite modest. Furthermore, there has been a small decline in the total number of bachelor's students in 2016 (the 2016-2017 academic year). The reason behind these findings is that following the July 15, 2016 coup attempt 15 higher education institutions associated with the Gulenist Terror Organization (FETÖ) were closed on July 23, 2016.

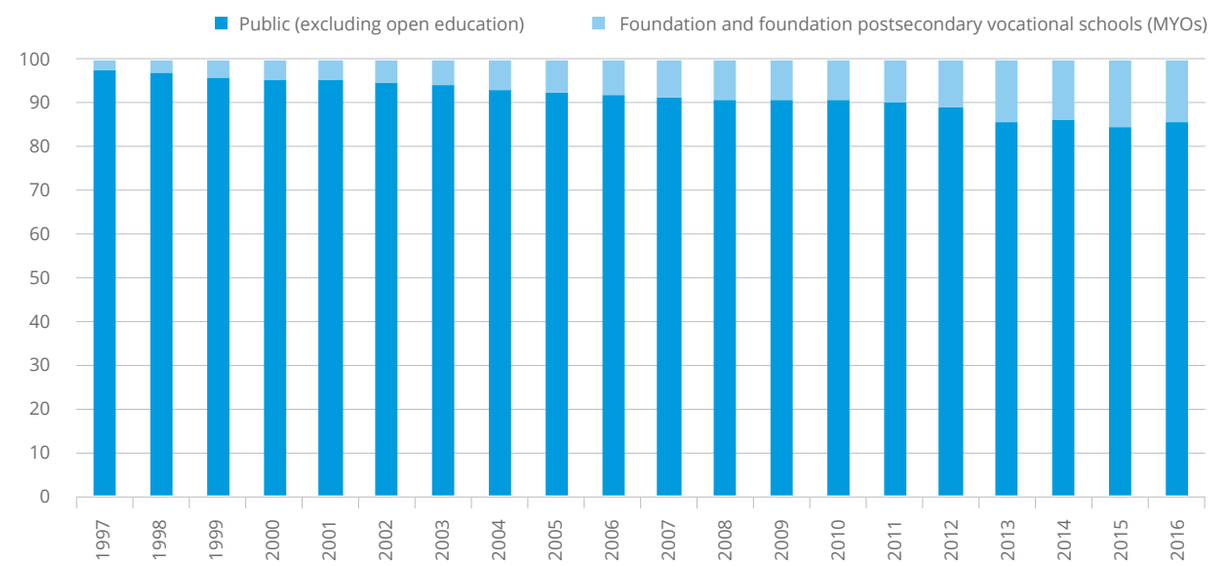
Figure B.3.3 shows the trends in the proportional distribution of the total number of higher education students according to institution type between the years 1986 and 2016 as percentages. Although the share of students in foundation programs among higher education was a mere 0.1% in 1986 in which the first foundation universities were founded, over time they improved their capacities and new foundation and MYOs were established. **As of 2016 foundation higher education institutions have expanded to accommodate 8.6% of all students.** However, as can be seen below, the share of foundation universities and MYOs within the system almost doubles (to 14.6%) when open education is excluded (see Figure B.3.4).

Figure B.3.3 Trends in the proportional distribution of the total number of higher education students by institution type (%) (1986-2016)



Source: Compiled using Higher Education Information Management system and ÖSYM data.

Figure B.3.4 Trends in the proportional distribution of the total number of higher education students by institution type (%) (1997-2016)



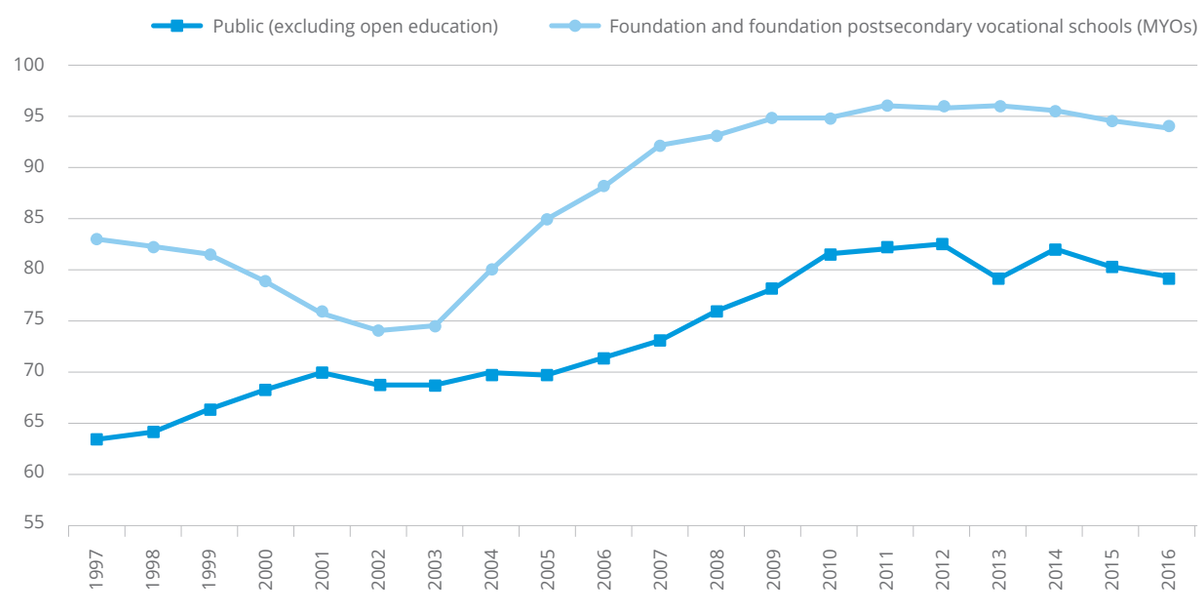
Source: Compiled using Higher Education Information Management system and ÖSYM data.

Figure B.3.4 shows the proportional distribution of the number of students by higher education institution type between 1997 and 2016. **While only 2.4% of students within the higher education system were frequenting foundation higher education institutions in 2007, this number increased to 14.6% in 2016.** In other words, higher education institutions in Turkey have reached a size that can now accommodate 1 out of every 7 students within the higher education system.

When discussing foundation higher education institutions within the education system as a whole, Istanbul should be assessed as a separate category. When the case of Istanbul is examined it can be observed that especially within the last 20 years a dual structure consisting of public and foundation universities has been established (Arlı, 2016). While 10% of public higher education institutions are in Istanbul, close to two thirds of foundation higher education institutions are in Istanbul. Istanbul's leading role is clearly visible, especially when the new enrolments are considered. **While in Istanbul 24% of newly enrolled students enrolled in foundation higher education institutions in 2000, this percentage increased to 37% in 2005, 45% in 2010 and 65% in 2014.** In other words, in Istanbul two out of every three students are enrolled in foundation higher education institutions.

Figure B.3.5 shows the trends in the gender ratio according to higher education institution type between 1997 and 2016. **Although the gender ratio in foundation institutions declined between 1997 and 2002, it remained higher than the gender ratios of public universities (except open education).** While as of 2016 the gender ratio of foundation higher education institutions is 94, that is to say that there are 94 females for every 100 male students, in public universities there are 79 females for every 100 male students. In other words, in terms of gender ratios foundation universities are better placed.

Figure B.3.5 Trends in the gender ratio according to higher education institution type (1983-2016)



Source: Compiled using Higher Education Information Management system and ÖSYM data.

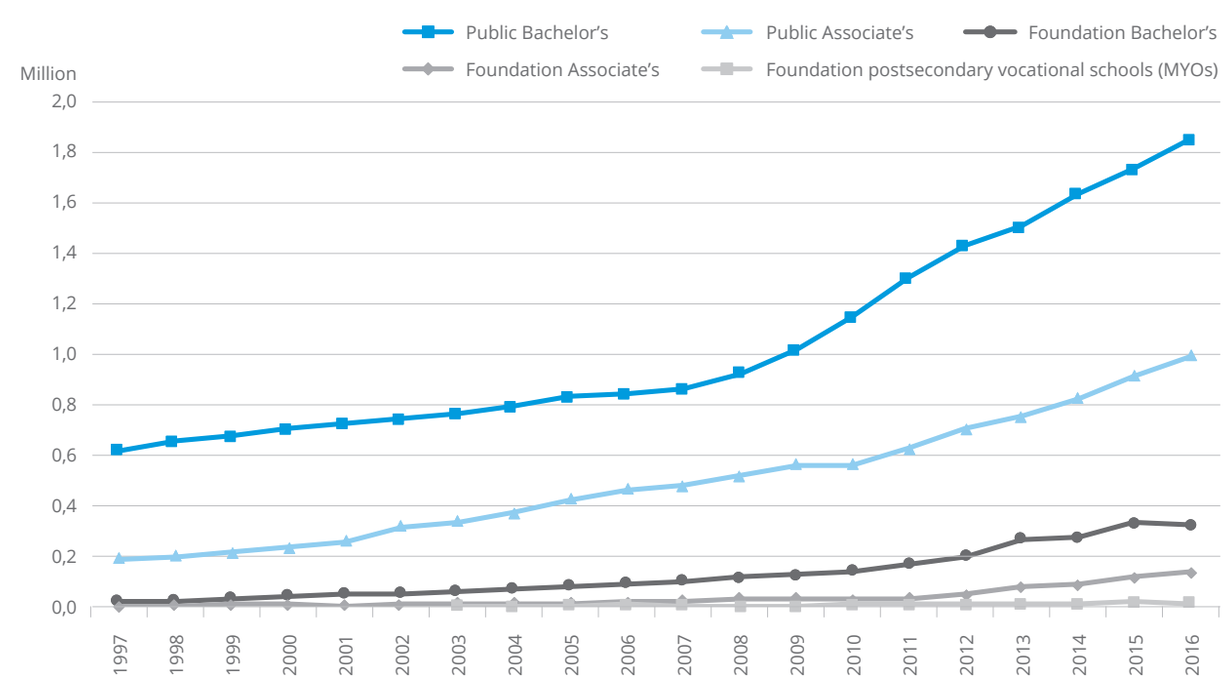
INDICATOR B4 ASSOCIATE'S and BACHELOR'S EDUCATION

As previously discussed briefly, associate's and bachelor's programs have played a key role in the increase of higher education students. In this indicator the trends in the number of students at the associate's and bachelor's levels will be examined.

Figure B.4.1 presents the trends in the number of students at the associate's and bachelor's levels according to higher education institution type between 1997 and 2016. There have been steady increases in associate's and bachelor's students in both public and foundation programs. **However, the main driving force behind this increase has been the students in public associate's and bachelor's programs.** According to figure B.4.1, while there were 192 thousand associate's level and 633 bachelor's level students enrolled in public universities in 2007, these numbers have since increased to 996 thousand and 1 million 850 thousand, respectively. However, the total number of bachelor's students at public and foundation higher education institutions is higher than the total number of associate's students. The main reason for this is that bachelor's programs (mostly 4 years) are longer than associate's programs (2 years). In addition, bachelor's programs are preferred to associate's programs, especially in foundation universities. Therefore, the total number of students at the bachelor's level is two times the number of students at the associate's level.

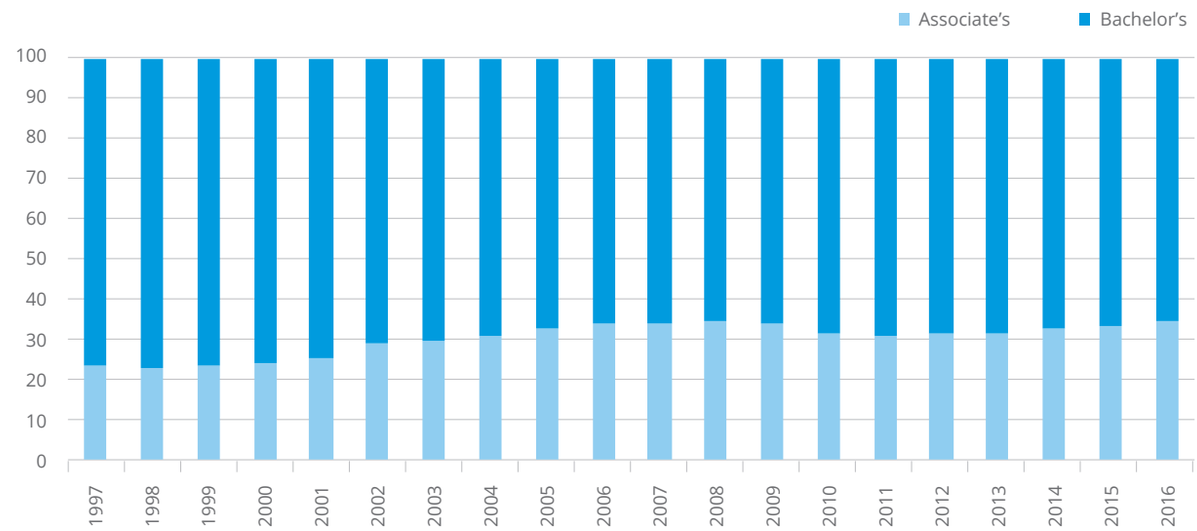
Figure B.4.2 shows trends in the shares of associate's and bachelor's students among all students (excluding graduates). **The share of associate's level students among all students has increased in a fluctuating manner from 23% in 1997 to 34% in 2016.** The increase of the share of associate's level students presents an advantage since associate's programs provide the opportunity to receive a higher education at a lower cost and in a shorter

Figure B.4.1 Trends in the number of students at associate's and bachelor's levels according to higher education institution type (1997-2016)



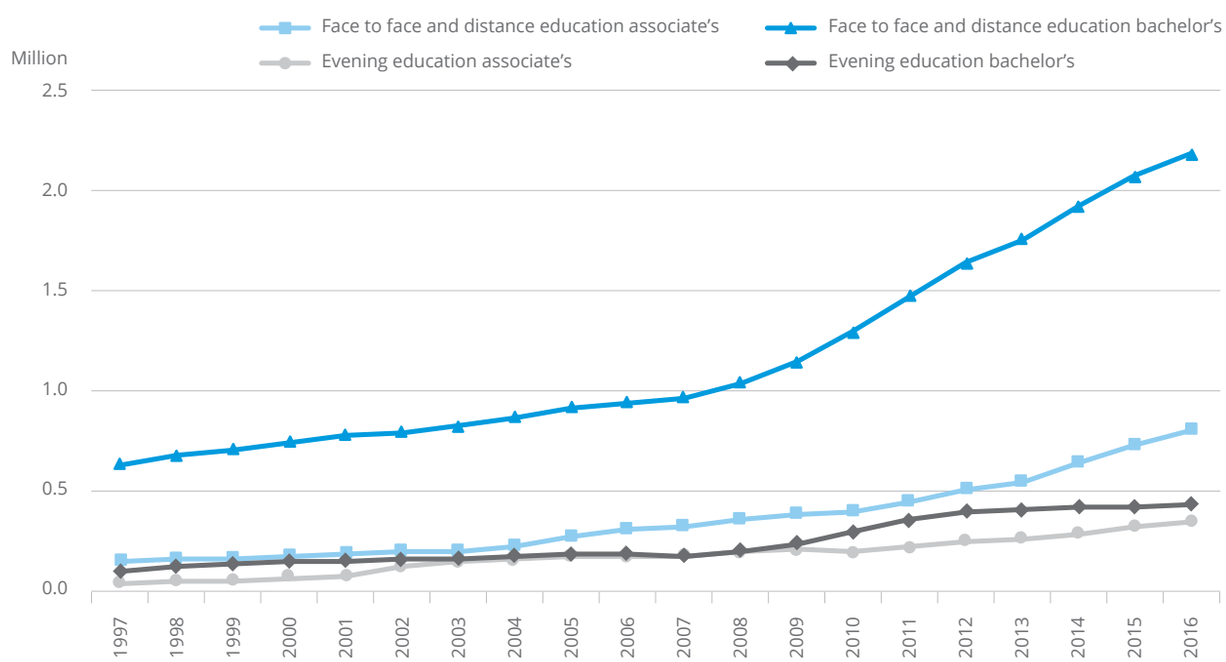
Source: Compiled using Higher Education Information Management system and ÖSYM data.
Note: Open education was not included in the calculations.

Figure B.4.2 Trends in the share of associate's and bachelor's among the total number of students (1997-2016)



Source: Compiled using Higher Education Information Management system and ÖSYM data.
Note: Open education and graduate students were not included in the calculations.

Figure B.4.3 Trends in the number of associate's and bachelor's students according to education type (1997-2016)



Source: Compiled using Higher Education Information Management system and ÖSYM data.
Note: Open education was not included in the calculations.

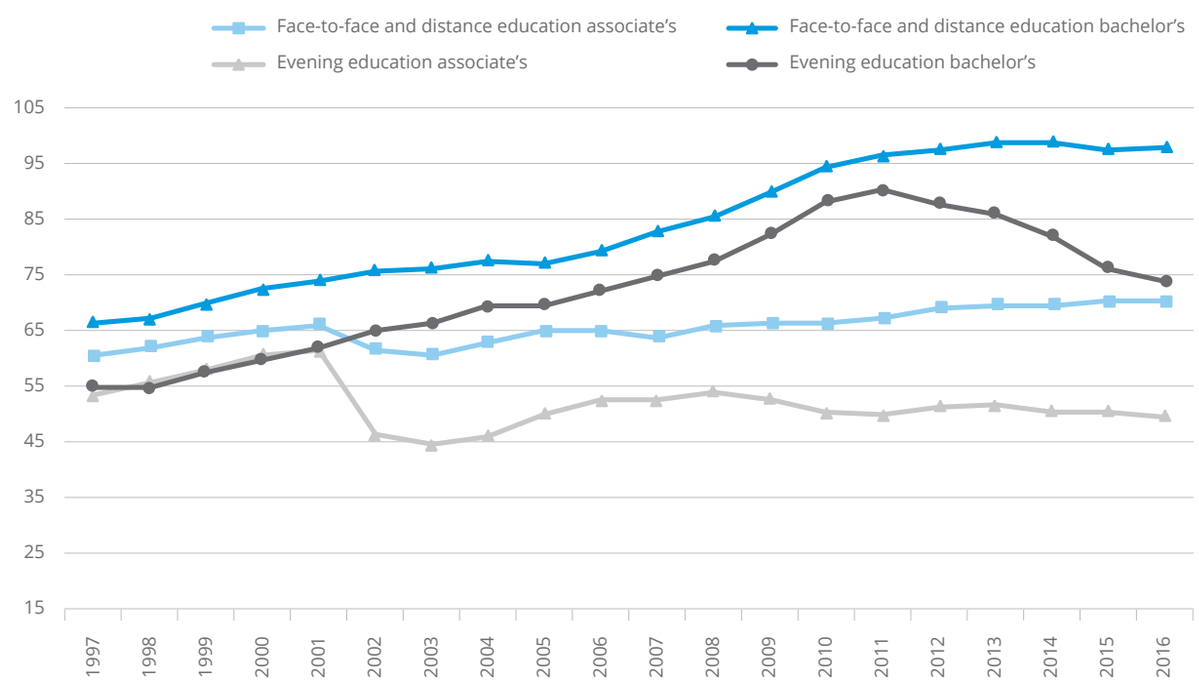
period of time. It is a known fact that health and informatics associate's programs which provide relatively better employment prospects are in high demand and thus there is no lack of enrolment (Günay & Özer, 2016). However, in addition to student preferences, quota policies have also directly impacted the increase in the number of students

enrolled in associate's programs. In other words, a significant portion of associate's students enrolled in associate's programs because they were not admitted into the bachelor's programs they wanted.

Figure B.4.3 shows the trends in the number of associate's and bachelor's students by education type between the years 1997 and 2016. The number of face-to-face and distance education associate's students has consistently increased from around 157 thousand in 1997 to 801 thousand in 2016. Face-to-face evening school associate's students have also increased in number from 40 thousand in 1997 to 342 thousand in 2016. **However, the education type that experienced the most significant increase between the years 1997 and 2016 is at the face-to-face and distance education bachelor's level.** While there were 633 thousand, face-to-face and distance education bachelor's students in 1997, this number increased to 2 million 177 thousand in 2016. On the other hand, the increase in the total number of students in evening education bachelor's programs has stagnated particularly between 2008 and 2012. The main reason for this is that the BHE has been closing down evening education programs since 2012. The motive behind this decision was to gain more control over the number of students being admitted to teaching programs in subjects that MONE was not in need of (see **Indicator C.2 Graduation in Higher Education**).

Figure B.4.4 shows trends in the gender ratio at the associate's and bachelor's level according to education type between 1997 and 2016. The education type that has experienced the most consistent progress in terms of gender ratio has been face-to-face and distance education bachelor's programs. In other words, **face-to-face and distance education bachelor's programs, which happen to be the most preferred among students, are also the type of education that has experienced the most progress in terms of gender ratios.** While the gender ratio in face-to-face and distance education bachelor's programs was 67 in 1997, this number increased to 98 in 2016 and gender parity has nearly been reached. However, as of 2016 the gender ratios of evening education associate's (50), face-to-face and distance associate's (70), and evening education bachelor's (74) have remained relatively low.

Figure B.4.4 Trends in the gender ratio at the associate's and bachelor's level according to education type (1997-2016).



Source: Compiled using Higher Education Information Management system and ÖSYM data.
Note: Open education was not included in the calculations.

INDICATOR B5

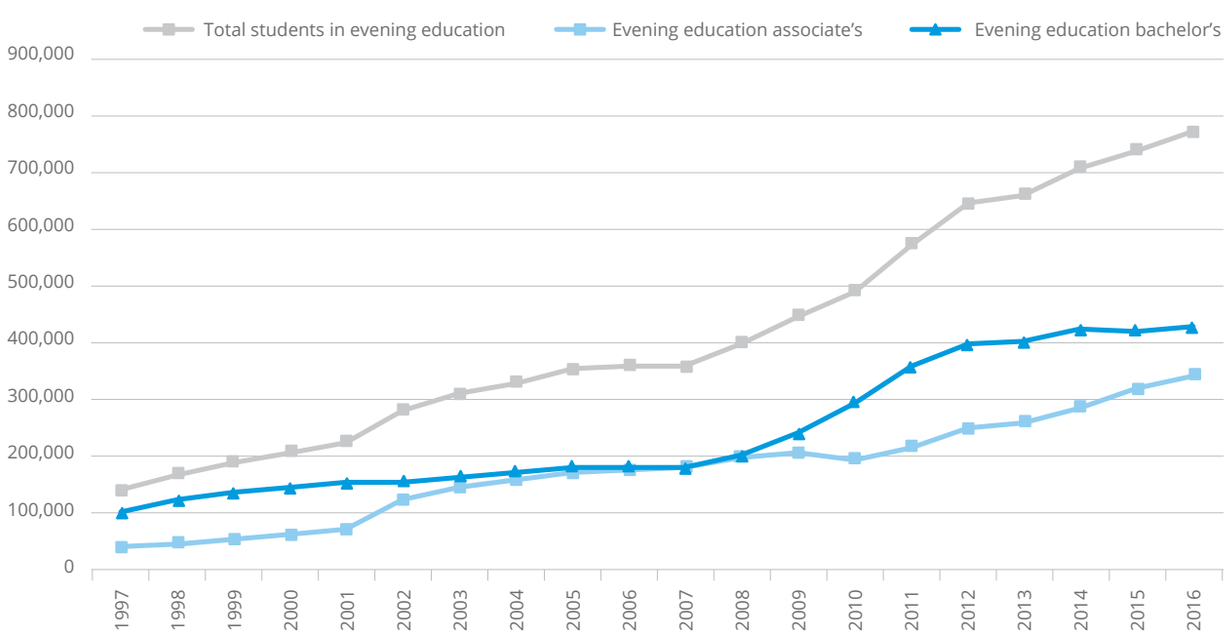
EVENING EDUCATION

Students in evening education programs receive face-to-face education just like daytime students. The only difference is that they pay higher tuition fees and their lectures take place in the evening. Since there is no evening education in open education the discussions in this indicator are not relevant to open education.

Figure B.5.1 shows the trends in the number of students receiving an evening education according to education level between 1997 and 2016. Although there have been periods in which the number of evening education students have stagnated at both the associate's and bachelor's level, overall the number of students in evening education programs has increased significantly. **While there were around 140 thousand students registered in open education programs in 1997, this number has surpassed 770 thousand as of 2016.** Nevertheless, while the number of associate's students receiving an evening education has increased steadily in recent years, the number of bachelor's students has remained around 400 to 420 thousand. As previously discussed, the main reason behind this stagnation is that the BHE has been closing down teaching programs in evening education which were not deemed to be necessary.

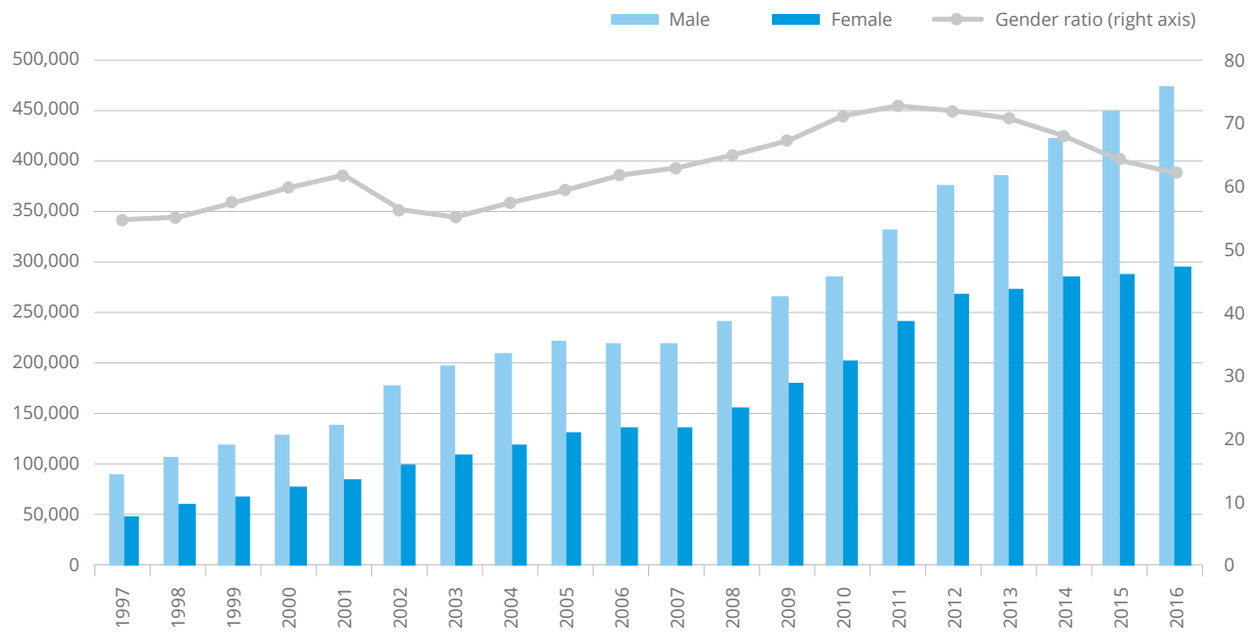
Figure B.5.2 shows the trends in the number of students and gender ratios in evening education between 1997 and 2016. Although there has been an increase in both male and female students, during the 2001-2003 and 2011-2016 periods the increase in male students was higher than the increase in female students thus causing a decline in the gender ratio in these years. As of 2016 the gender ratio is 62. In other words, there are 62 female students studying in evening education programs for every 100 male students. This situation, as it will be discussed later on, may be the result of female students' tendencies not to prefer evening education programs.

Figure B.5.1 Trends in the number of students receiving evening education (1997-2016)



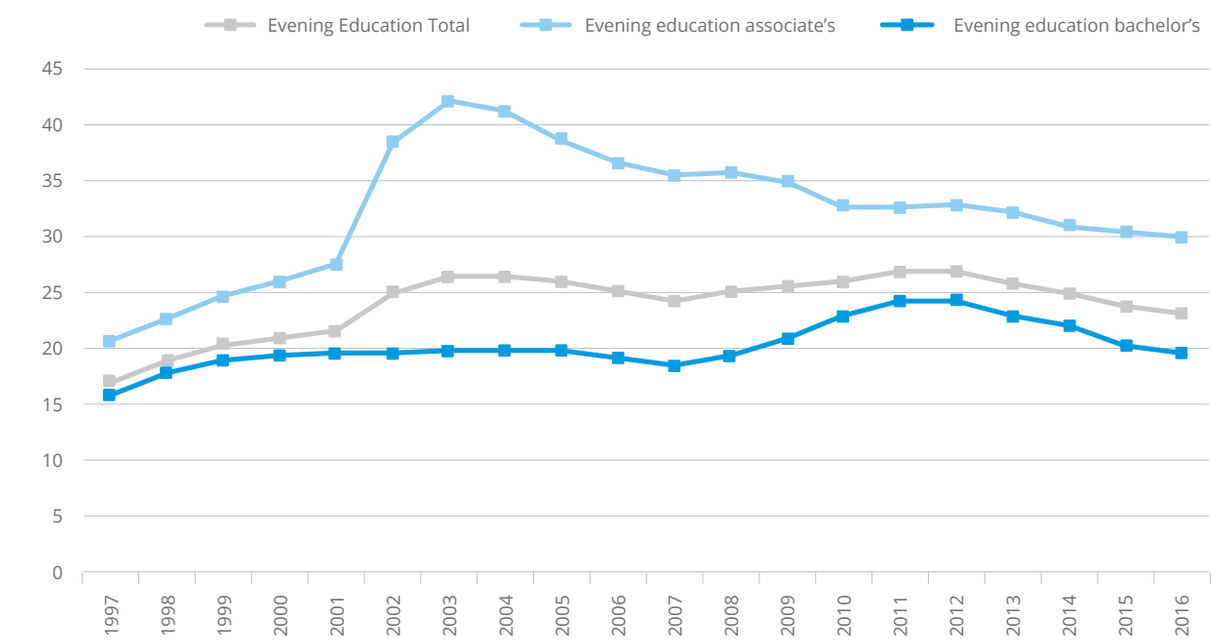
Source: Compiled using the Higher Education Information Management System and ÖSYM data.

Figure B.5.2 Trends in total number of students and gender ratios by gender (1997-2016).



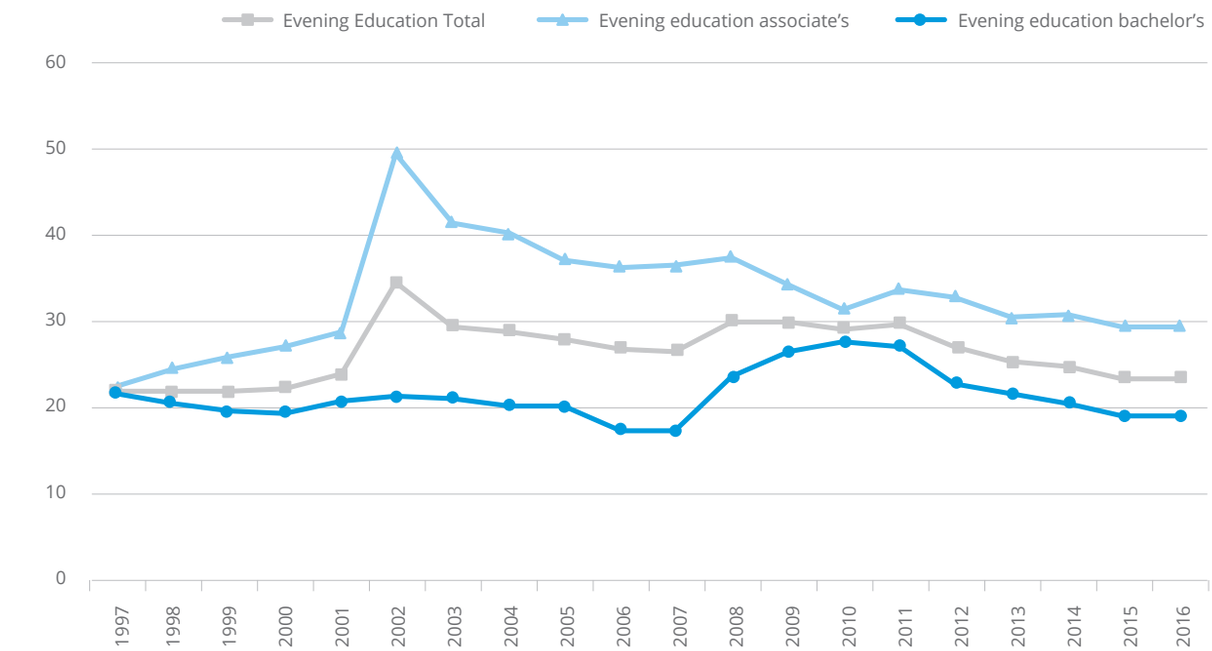
Source: Compiled by using the Higher Education Information Management System and ÖSYM data

Figure B.5.3 Trends in the share of evening education students among the total number of associate's and bachelor's students (%) (1997-2016)



Source: Compiled using the Higher Education Information Management System and ÖSYM data

Figure B.5.4 Trends in the share of evening education students among newly enrolled associate's and bachelor's students (%) (1997-2016)



Source: Compiled using the Higher Education Information Management System and ÖSYM data

Figure B.5.3 shows the trends in the share of evening students among the total number of associate's and bachelor's students between 1997-2016. While evening education had a share of around 17% of the total associate's and bachelor's student population, this share increased to between 23%-27% particularly after the 2000s. In other words, **students enrolled in evening education programs make up one fourth of the current higher education system at the associate's and bachelor's level.** As of 2016, evening education makes up 30% of students at the associate's level and 20% at the bachelor's level.

Figure B.5.4 shows the trends in the share of evening education students among newly enrolled associate's and bachelor's students between 1997 and 2016. **The share of students enrolled in evening education among all newly enrolled associate's and bachelor's students has generally been between 22% and 30% and as of 2016 it is 23%.** However, there has been a decline in enrolment reaching from 30% to 23% in evening education programs particularly in 2008 and thereafter.

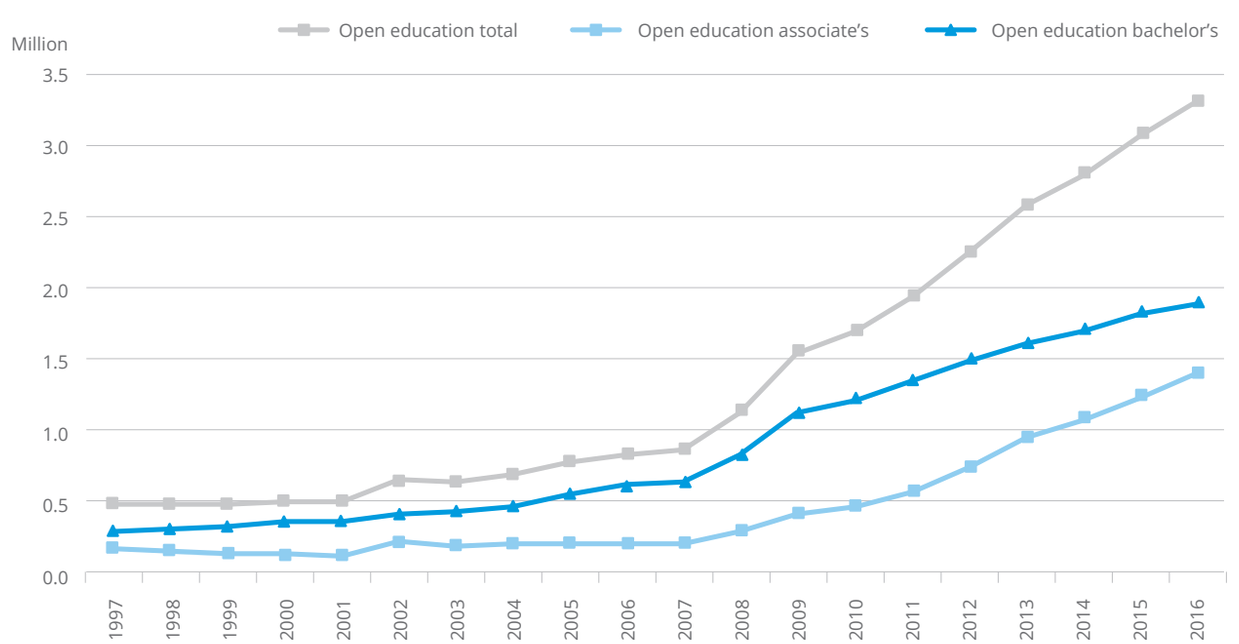
INDICATOR B6

OPEN and DISTANCE EDUCATION

Open education is a type of education which was first established in Anadolu University in the 1980s to meet the increasing demand for education and has since been set up in other universities in recent years. Open education was established in order to provide additional capacity similar to evening education. The expansion of the system, began after 1992 when numerous associate's and bachelor's programs were established (BHE, 2007; Çetinsaya, 2014). According to the Procedures and Principles Regarding Distance Education in Higher Education Institutions which is issued by the BHE, open education is defined as the education in which "educational activities are carried out through information and communications technologies and is based on students interacting with each other without needing an instructor in the same space while teaching classes". Although as of 2017 many universities provide distance education, there are three universities which provide both open and distance education. These are the Anadolu University Open Education Faculty, Istanbul University Open and Distance Education Faculty and Ataturk University Open Education Faculty. Open education programs have become particularly popular among university graduates who want to attend a second university without taking an exam and the open education system has reached a significant size in terms of student population. This situation is examined in detail in this indicator.

Figure B.6.1 shows the trends in the total number of students in open education by education level. **While the increase in open education students at both the associate's and bachelor's level was relatively small in the 1997-2007 period, the increase of students in open education at the associate's and bachelor's levels was much higher in the 2008-2016 period.**

Figure B.6.1 Trends in the total number of open education students according to educational level (1997-2016).

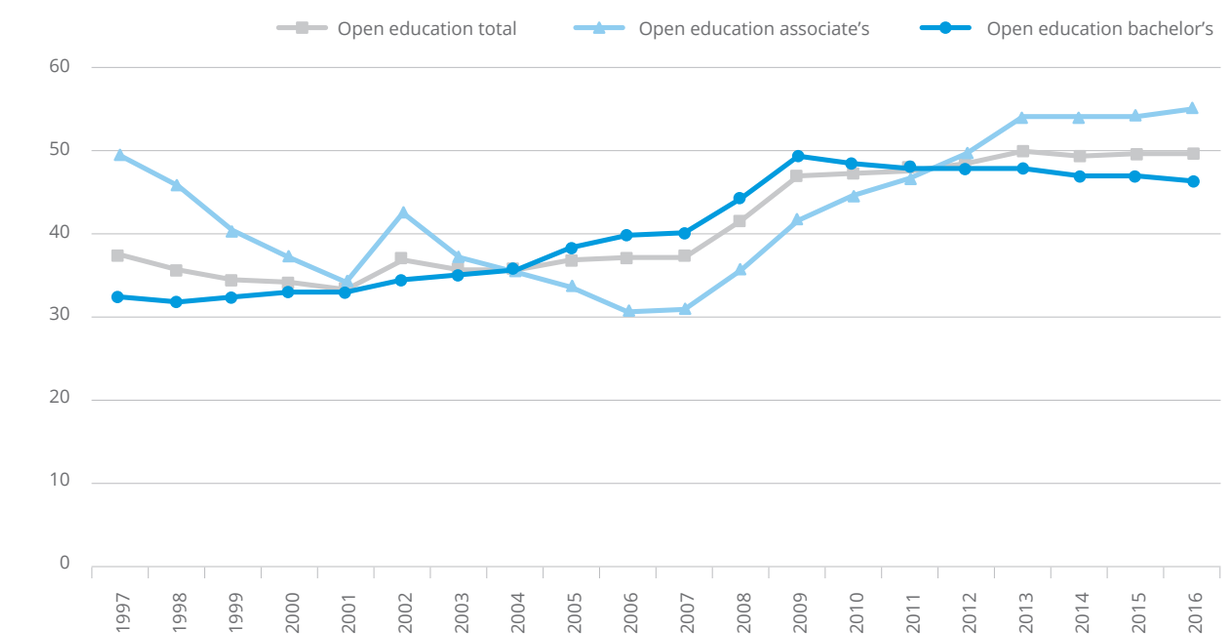


Source: Compiled using the Higher Education Information Management System and ÖSYM data

While there were around 500 thousand students receiving an open education in 2007, this number reached 845 thousand in 2006 and over 3 million 307 thousand in 2016. When associate's and bachelor's students in open education are compared, it can be observed that there has been a relatively faster increase at the associate's level in the 2008-2016 period. The main reasons behind this increase at the associate's and bachelor's levels have been the low tuition fees and increase in quotas. Furthermore, the total number of open education bachelor's students and periods of study are increasing even more due to the fact that open education bachelor's students are able to defer their military service for a certain period.

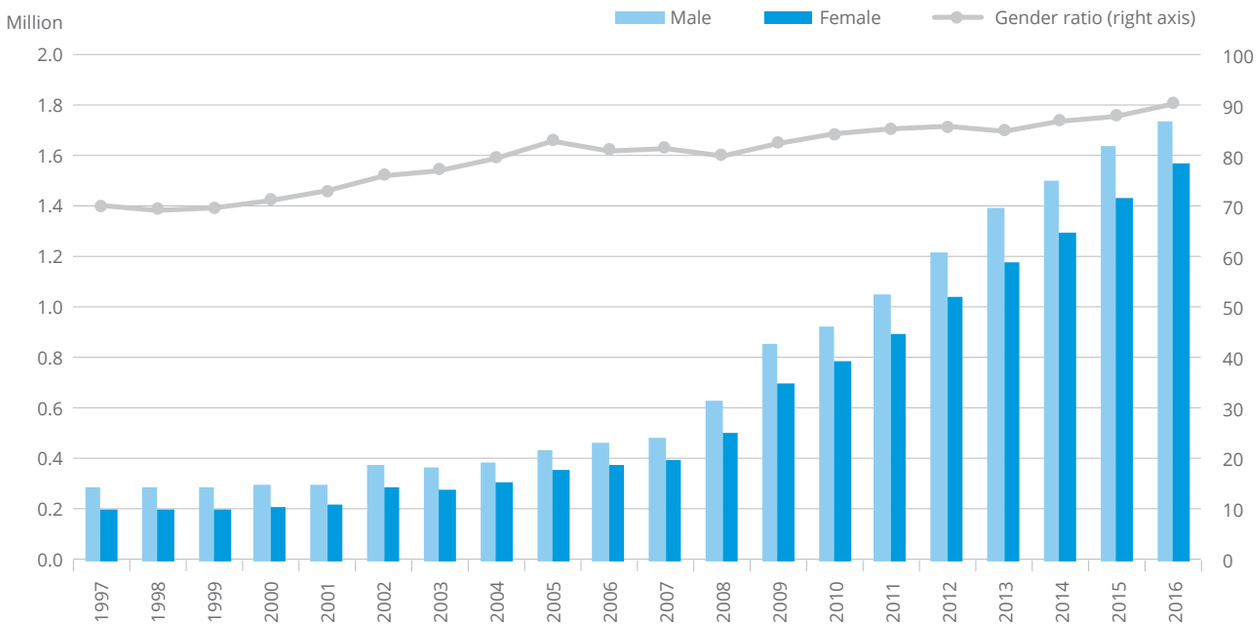
Figure B.6.2 shows the trends in the share of open education students among all associate's and bachelor's students between the 1997 and 2016. While 38% of students were receiving open education in 1997, this number reached 50% in the years between 2013 and 2016. In other words, **half of all the students at the associate's and bachelor's level are open education students.** These ratios are 47% for the bachelor's level and 54% for the associate's level. When only public universities are taken into account, the share of open education students among all associate's and bachelor's students is 53.7%. In other words, most of the associate's and bachelor's students studying in public universities are open education students. The total number of associate's and bachelor's students currently studying in 108 public universities is less than the total number of open education students studying in the three previously mentioned universities. Open education, which was established due to the lack of capacity in face-to-face education, has overtime reached an enormous size that makes up more than half of the higher education system. As will be discussed later on, this is an important issue concerning the quality and the image of Turkish higher education and it must be addressed.

Figure B.6.2 Trends in the share of open education students among all associate's and bachelor's students (1997-2016) (%)



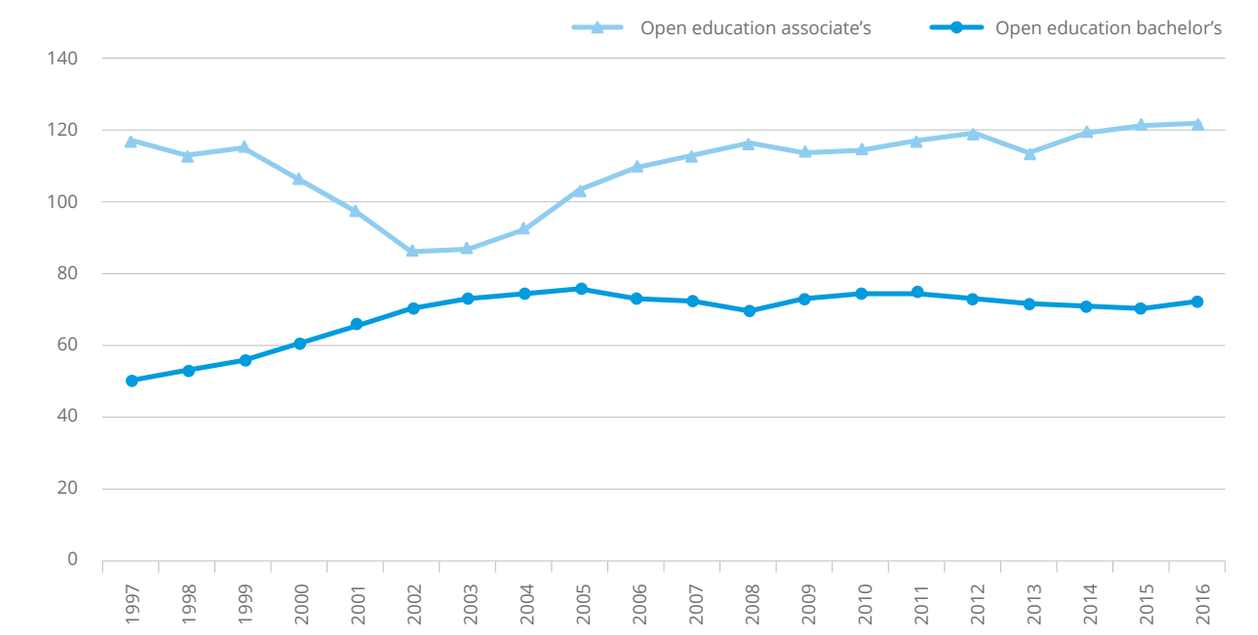
Source: Compiled using the Higher Education Information Management System and ÖSYM data

Figure B.6.3 Trends in the total number of open education students and gender ratio by gender (1997- 2016)



Source: Compiled using the Higher Education Information Management System and ÖSYM data.

Figure B.6.4 Trends in the gender ratios of open education students according to education level (1997-2016)



Source: Compiled using the Higher Education Information Management System and ÖSYM data.

Figure B.6.3 shows the trends in the total number of open education students and gender ratios by gender between 1997 and 2016. According to the figure, both the number of female and male students have increased constantly. **While the gender ratio was 70 in 1997 this number has generally been increasing over the years and reached the 90 in 2016.** This shows that there have been developments in favour of female students, although gender parity has not been fully reached. In order to carefully examine this situation, it is useful to look at open education gender ratios by education level (Figure B.6.4).

Figure B.6.4 shows trends in the gender ratios of open education students according to education level between 1997 and 2016. The figure shows that the gender ratio at the associate's level has consistently been higher than the gender ratio at the bachelor's level. Moreover, although the gender ratio has generally increased in 2002 and thereafter at the associate's level, during the same period the gender ratio at the bachelor's level was relatively stagnate. As of 2016 the gender ratio at the associate's level is 122 while at the bachelor's level this ratio is 72. **This shows that there is a favourable situation for female students at the associate's level while there is a favourable situation for male students at the bachelor's level.** The most probable reason for this is that female students prefer associate's studies due to its content and short study period while male students prefer bachelor's programs which enable them to serve a shorter military service period (see Chapter B. Highlights). Table B.6.5 shows the number of open education students within the context of second diploma programs without an exam by university and level of education for the 2016-2017 academic year. According to the table, **within the context of second diploma programs without an exam there are 360 thousand students at Anadolu University, 104 thousand at Atatürk University and 49 thousand at Istanbul University and a grand total of 513 thousand.**

Table B.6.6 shows the number of open education graduates in the context of second university without an exam according to university and level of education. While Atatürk and Istanbul university produced graduates for the first time in the 2015-2016 academic year, Anadolu University has been producing graduates for a long time. In the context of second diploma programs without an exam, 176 thousand students graduated from Anadolu University in the 2004-2015 period, 26 thousand students graduated from Atatürk University in the 2015-2016 academic year and 1,374 from Istanbul University.

Table B.6.5 Number of open education students who already have a college diploma and thus are placed into open education programs without an exam according to university and the level of education (2016-2017)

	Associate's			Bachelor's			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Anadolu University	115,716	115,137	230,853	68,464	61,344	129,808	184,180	176,481	360,661
Atatürk University							59,562	44,115	103,677
Istanbul University	4,503	7,813	12,316	16,403	20,009	36,412	20,906	27,822	48,728
Total							264,648	248,418	513,066

Source: This table was prepared using data obtained from Anadolu, Atatürk and Istanbul Universities.
Note: The number of associate's and bachelor's students at Atatürk University could not be obtained and therefore was not shown in the table.

Table B.6.6 The number of open education graduates who have already obtained a college diploma and thus were placed into open education programs without an exam according to the university and the level of education (2004-2015)

	Associate's			Bachelor's			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Anadolu University (2004-2015)	66,755	63,053	129,808	26,320	18,484	44,804	93,651	82,039	175,690
Atatürk University (2015)	15,490	10,056	25,546	55	66	121	15,545	10,122	25,667
Istanbul University (2015)	303	670	973	163	238	401	466	908	1,374

Source: This table was prepared using data obtained from Anadolu, Atatürk and Istanbul Universities.

Table B.6.7 The average age of open education graduates who have already obtained a college diploma and thus were placed into open education programs without an exam according to the university and the gender (2004-2015)

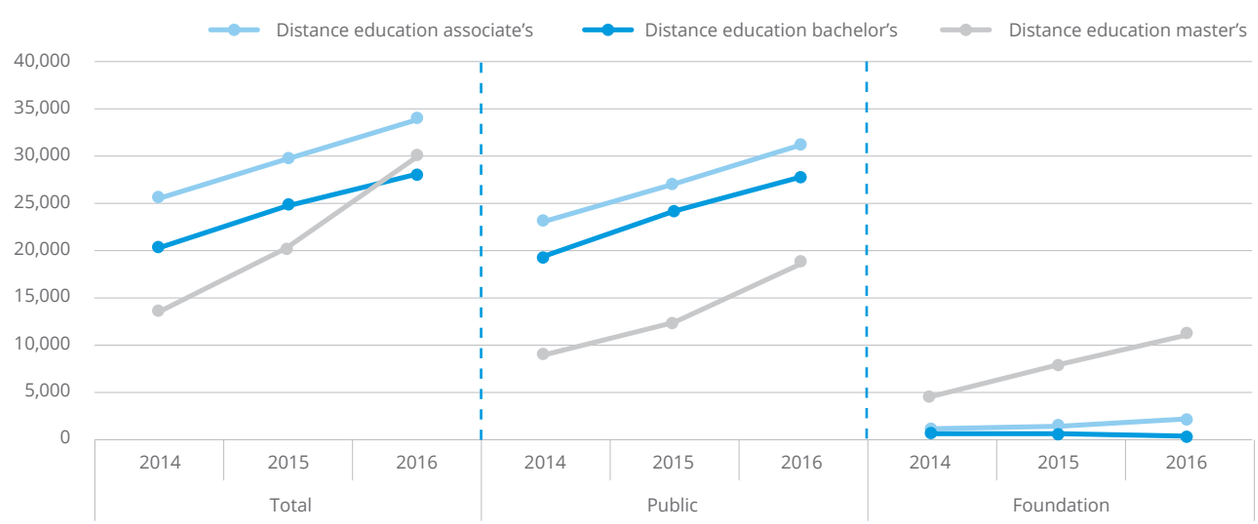
	Year	Male	Female
Anadolu University	2004	42	41
	2005	40	40
	2006	39	38
	2007	38	37
	2008	37	36
	2009	35	34
	2010	34	33
	2011	34	32
	2012	33	33
	2013	34	33
	2014	34	33
	2015	34	34
Atatürk University	2015	34	34
Istanbul University	2015	35	34

Source: This table was prepared using data obtained from Anadolu, Atatürk and Istanbul Universities.
Note: The average age was calculated for graduates of bachelor's programs.

Table B.6.7 presents the average age of open education graduates who have already obtained a college diploma and thus were placed into open education programs without an exam according to the university and the gender in the 2004-2015 period. According to the table, **while the average age of graduates from Anadolu University in the context of second university attendees without an examination was 42 for males and 41 for females in 2004, the averages have generally tended to decline and were down to 34 in 2015 for both males and females.** There is a similar situation for the graduates from Istanbul and Ataturk Universities in the context of secondary university applications without examination in 2015. While the average age of graduates from Ataturk University in this situation was 34; the average age of male graduates from Istanbul University was 35 while for females it was 34. **When these numbers are considered together they show that open education is increasingly preferred by younger graduates and students who are already studying at another university.**

Figure B.6.8 shows the trends in the total number of students receiving a distance education according to higher education institution type and education level between 2014 and 2016. According to the figure there have been increases at the associate's, bachelor's and master's levels. However, this increase has been heavily driven by the students in associate's and bachelor's programs at public universities. Moreover, in terms of foundation universities

Figure B.6.8 Trends in the total number of students in distance education according to higher education institution type and education level (2014-2016)

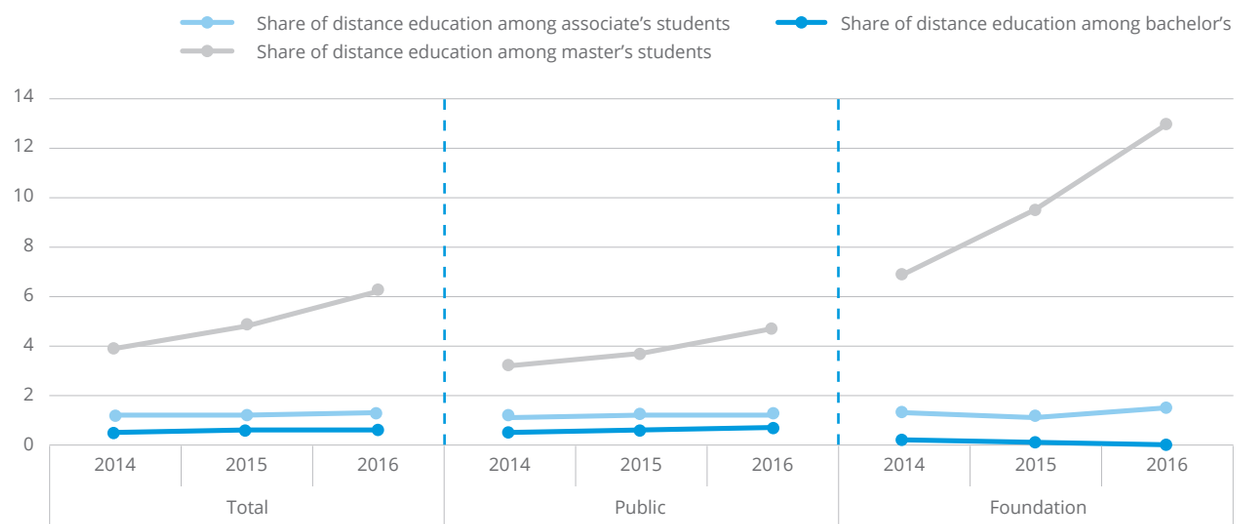


Source: Compiled using the Higher Education Information Management System and ÖSYM data.
Note: Data for foundation postsecondary vocational schools have been excluded.

the master's level distance education programs are more popular than associate's or bachelor's level distance education programs.

Figure B.6.9 shows the trends in the share of distance education students among all students according to university type and education level between 2014 and 2016. The share of distance education students among bachelor's students was 0.7% in 2016 and the share of distance education students among associate's students was 1.3%. However, the share of distance education students increased from 3.9% in 2014 to 6.2% in 2016. The driving force behind this increase has been the increasing number of distance education master's students in foundation universities. Indeed, as of 2016, 13% of all master's students in foundation universities are in distance education programs.

Figure B.6.9 Trends in the share of distance education students among all students according to higher education type and education level (%) (2014-2016)



Source: Compiled using the Higher Education Information Management System and ÖSYM data.
Note: Data for foundation vocational schools of education have been excluded.

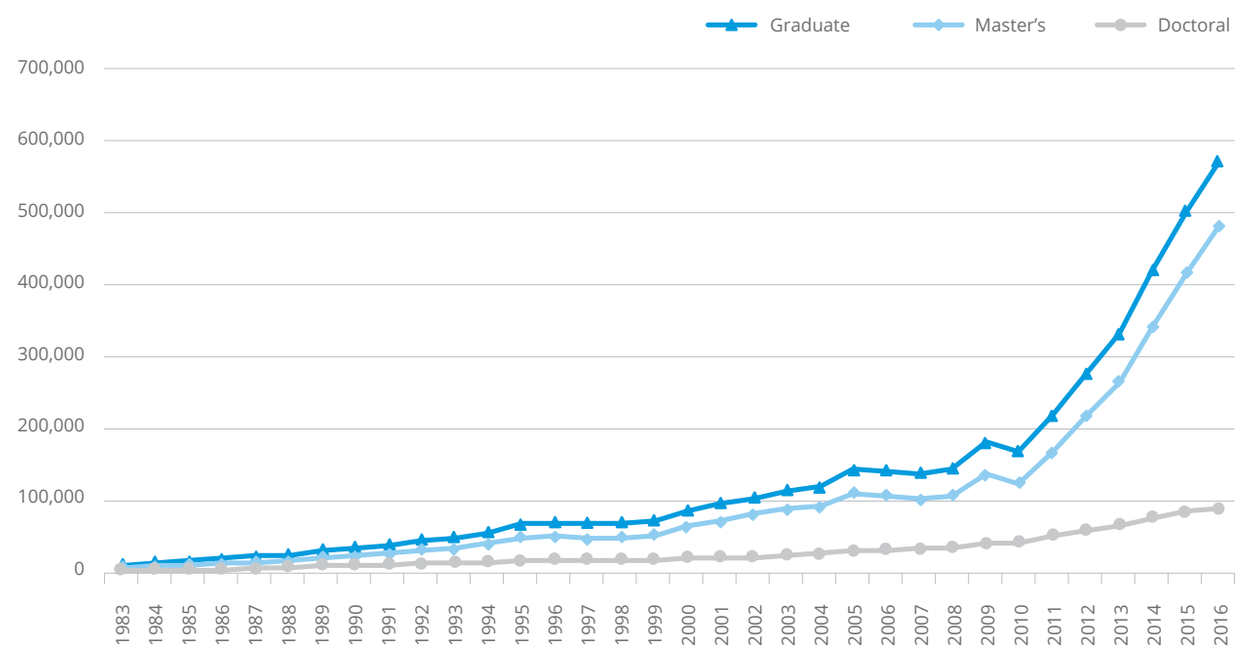
INDICATOR B7

GRADUATE EDUCATION

In this indicator the trends in the number of graduate (master's and doctoral) students and trends in the gender ratio have been reviewed. In this context the total number of graduate students and newly enrolled graduate students has been examined. With the exception of certain years, the number of graduate students has increased significantly. While there were around 13 thousand graduate students in 1983, this number reached around 73 thousand at the end of the 1990s and surpassed 571 thousand in 2016. **The main source of this increase has been the increase in master's students rather than doctoral students.** The demand for master's degrees has generally been driven by the increase in bachelor's graduates due to increased access to bachelor's higher education programs and by increased competition in the labour market. Master's programs play an important role in meeting the human resource demands of a dynamic labour market. Furthermore, the fact that in the past certain teaching programs produced graduates at the master's level and that there are certain professions (such as clinical psychology) that require a master's degree has increased the demand for master's degrees. However, there has also been a significant increase in the number of doctoral students, although this increase has been relatively modest compared to the increase at the master's level. While there were around 4 thousand doctoral students in 1983, this number has reached around 91 thousand in 2016.

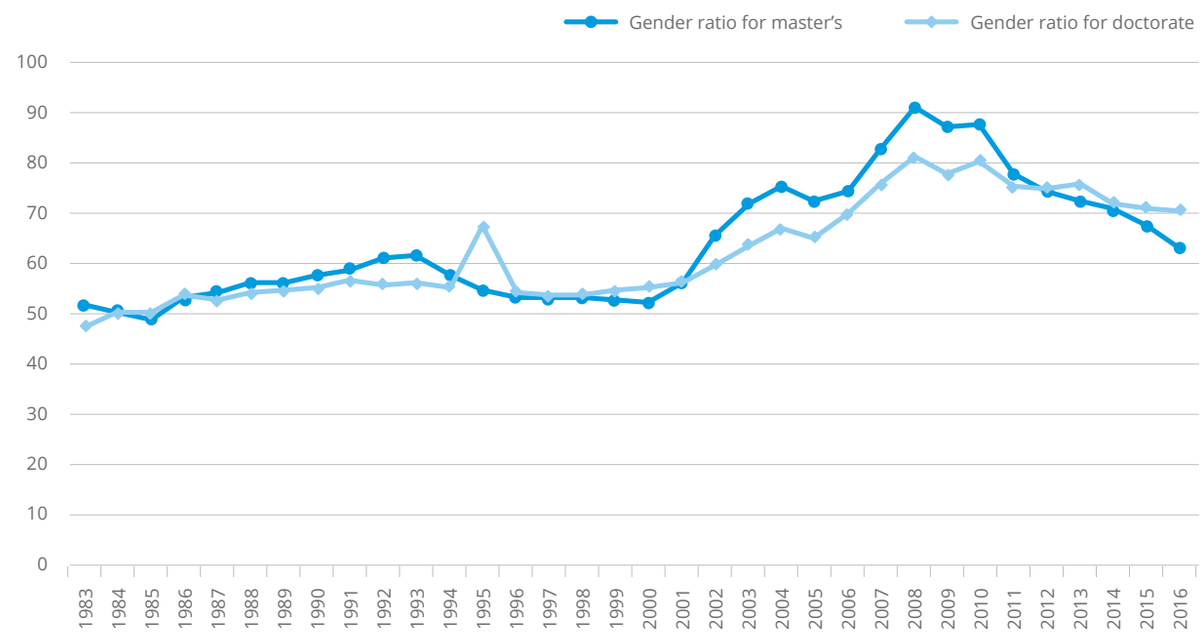
Figure B.7.2 shows the gender ratios of graduate students by education level between 1983 and 2016. While the gen-

Figure B.7.1 Trends in the total number of graduate students by education level (1983-2016).



Source: Compiled using the Higher Education Information Management System and ÖSYM data.

Figure B.7.2 Trends in the gender ratios of graduate students by education level (1983-2016)



Source: Compiled using the Higher Education Information Management System and ÖSYM data.

der ratio at the doctoral level was 47 in 1983, this number increased with fluctuations to 70 in 2016. The gender ratio at the master's level has fluctuated over the years and increased from 52 in 1983 to 63 in 2016. **According to the figure, the gender ratios at the master's and doctoral levels have also experienced fluctuations. However, the gender ratios have been relatively negatively impacted by the rapid growth following 2008.**

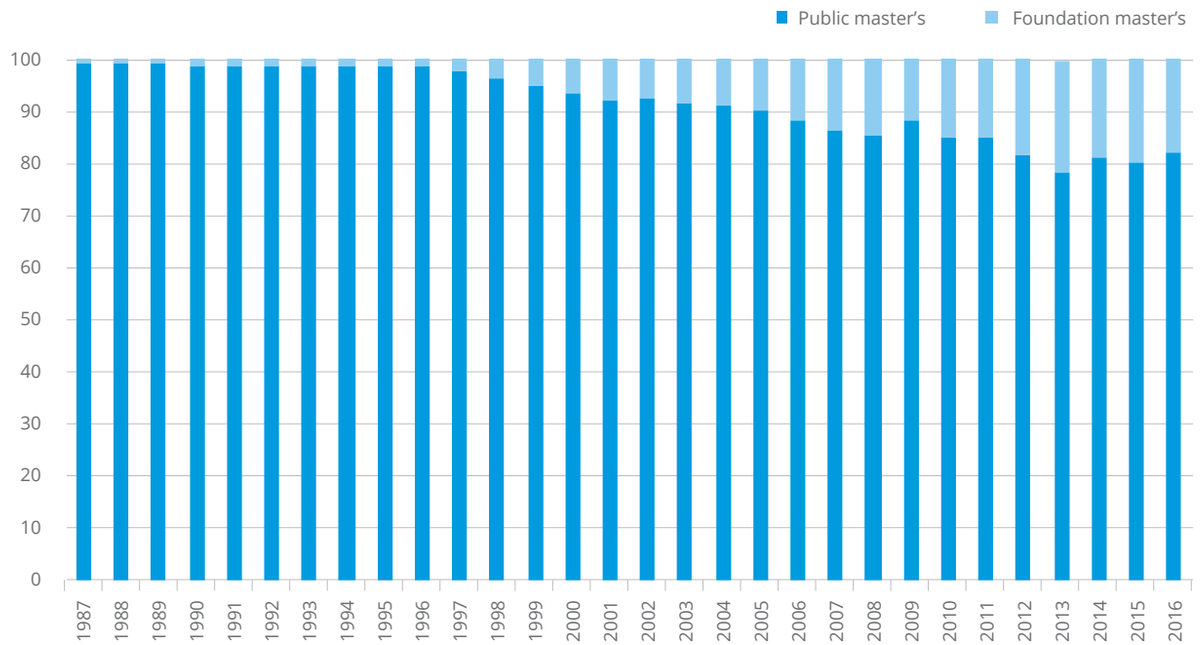
Table B.7.3 shows the number of graduate students according to fields of education and study based on data from the 2016-2017 academic year. According to the table the

Table B.7.3 Number of graduate students according to field of education and study (2016)

Fields of education and study	Master's			Doctoral		
	Male	Female	Total	Male	Female	Total
Information and communication technologies	2,415	813	3,228	251	117	368
Natural sciences, mathematics and statistics	21,362	19,390	40,752	6,169	6,626	12,795
Education	19,285	21,319	40,604	3,406	3,595	7,001
Services	11,303	3,888	15,191	777	443	1,220
Business, administration and law	105,024	46,863	151,887	10,829	5,637	16,466
Engineering, manufacturing and construction	57,744	25,442	83,186	14,103	6,586	20,689
Health and well being	5,731	12,534	18,265	2,400	3,944	6,344
Arts and humanities	32,933	28,993	61,926	8,015	5,541	13,556
Social sciences, journalism, informatics	27,962	20,824	48,786	5,654	3,910	9,564
Agriculture, forestry, fishery and veterinary	10,633	5,747	16,380	1,996	1,268	3,264
Total	294,397	185,818	480,215	53,600	37,667	91,267

Source: Compiled by using the Higher Education Information Management System data.

Figure B.7.4 Trends in the proportional distribution of master's students according to higher education type (%) (1987-2016)



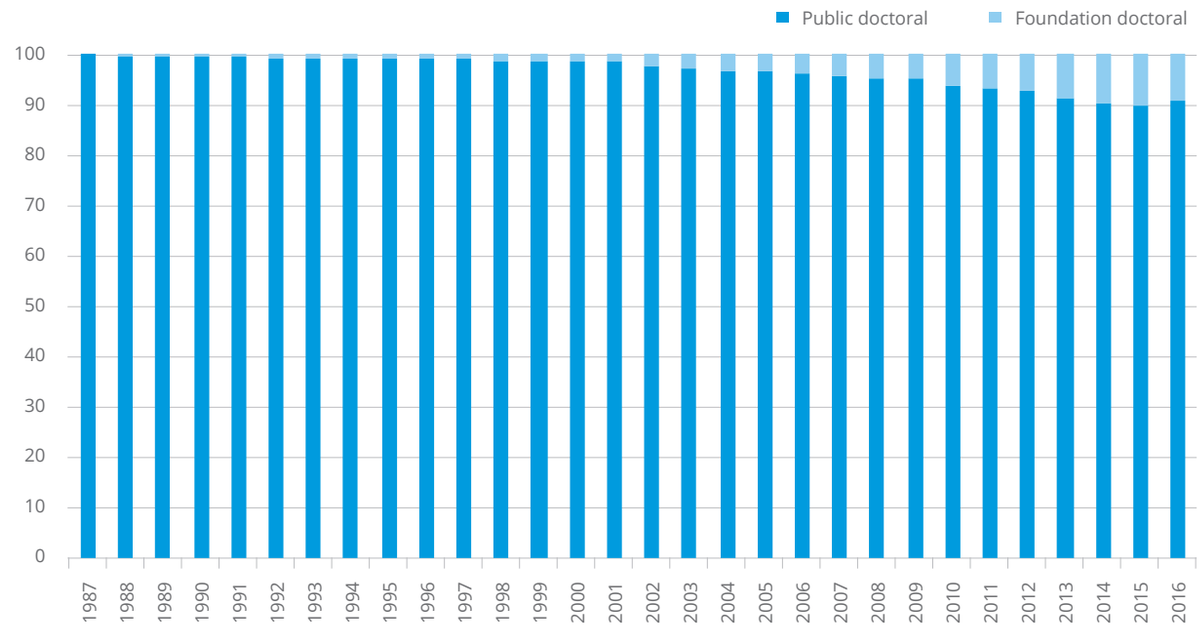
Source: Compiled using the Higher Education Information Management System and ÖSYM data.

fields of study with the most master's students are placed in the following order: Business, administration and law (152 thousand); engineering, manufacturing and construction (83 thousand), arts and humanities (62 thousand), social sciences, journalism, informatics (48 thousand). The fields with the most doctoral students place as follows: engineering, manufacturing and construction (21 thousand); business, administration and law, arts and humanities, natural sciences, mathematics and statistics (thirteen thousand).

Figure B.7.4 shows the trends in the proportional distribution of master's students by higher education institution between 1987 and 2016. While almost all master's students (99.4%) were receiving an education in public schools, 80% of master's students were studying at public universities while 20% were studying in foundation universities in 2015. In the 2016-2017 academic year, 18% of master's students are studying at foundation universities. **As these figures clearly demonstrate, just as in the case at the bachelor's level, foundation universities have reached a significant volume within the higher education system at the master's level.**

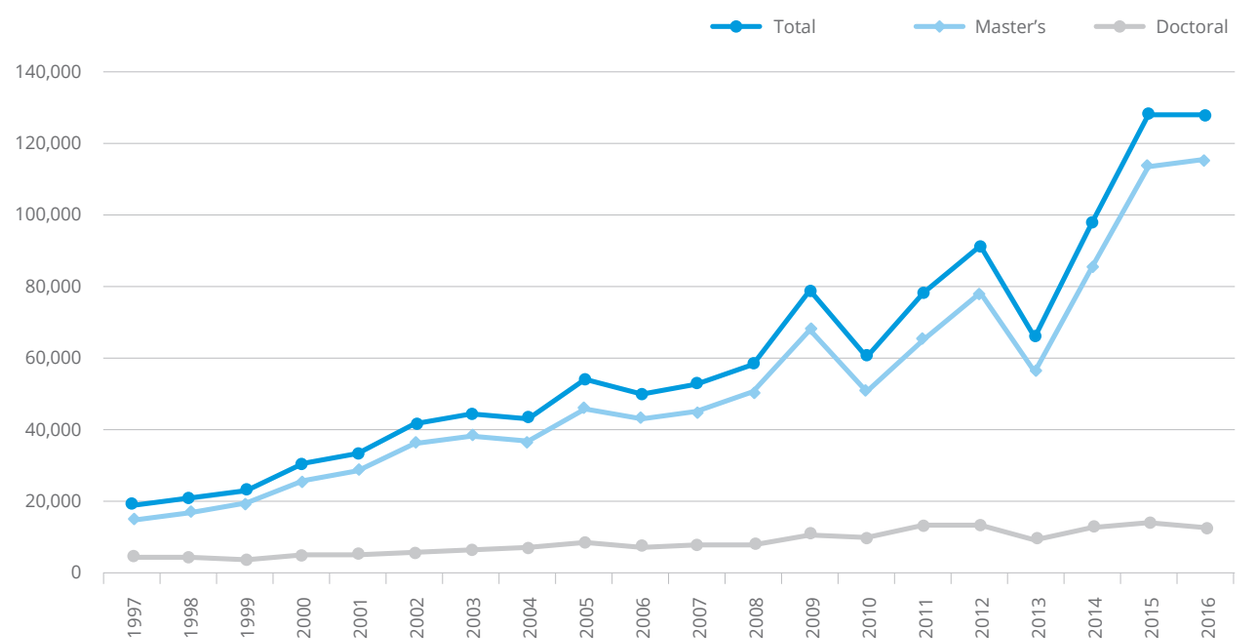
Figure B.7.5 shows the trends in the proportional distribution of doctoral students according to higher education type between the years 1987 and 2016. **While at the beginning of this period almost all doctoral students (99.9%) were studying in public universities, as of 2016 91% of doctoral students are studying in public universities and 9% are studying in foundation universities.** As these figures clearly indicate, foundation universities have also reached a significant volume within the Turkish higher education system at the doctoral level as well. However, the share of foundation universities at the doctoral level is lower than the share at the bachelor's and master's level. This can be explained by the fact that foundation universities are more demand driven and doctoral education is more expensive.

Figure B.7.5 Trends in the proportional distribution of doctoral students by higher education type (1987-2016)



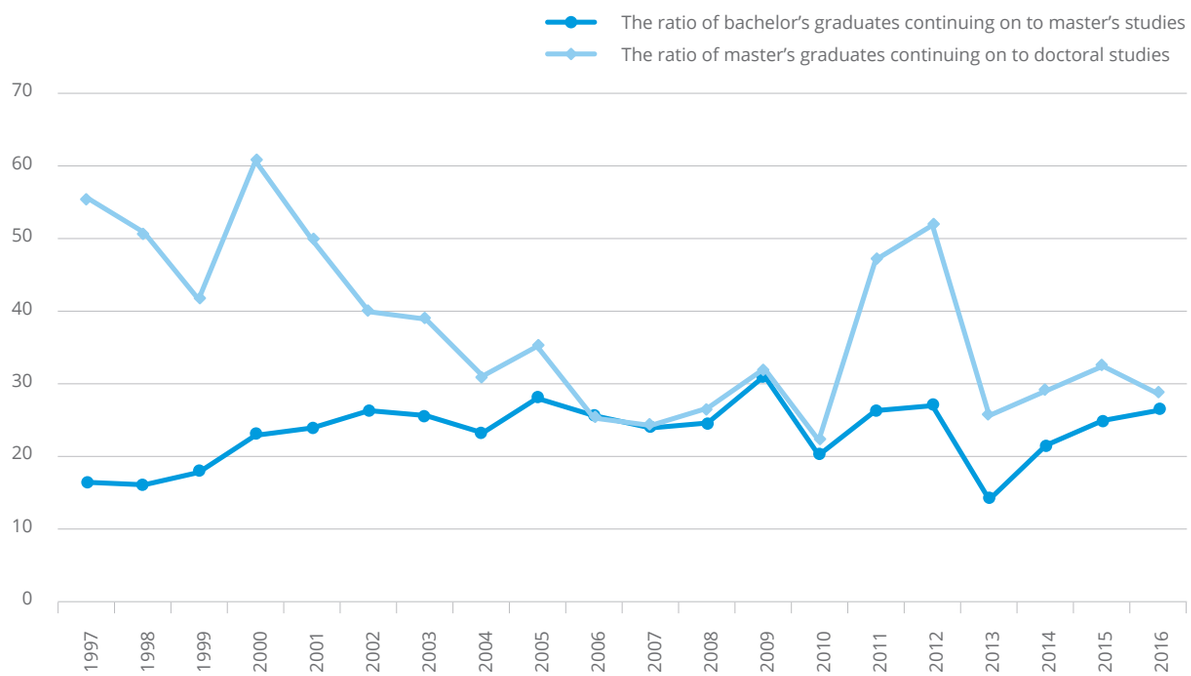
Source: Compiled using the Higher Education Information Management System and ÖSYM data.

Figure B.7.6 Trends in the number of newly enrolled graduate students by level of education (1997-2016)



Source: Compiled using the Higher Education Information Management System and ÖSYM data.

Figure B.7.7 Trends in the share of bachelor's and master's graduates continuing their graduate education (%) (1997-2016)



Source: Compiled using the Higher Education Information Management System and ÖSYM data.

Figure B.7.6 shows the trends in the number of newly enrolled graduate students by education level between the years 1997 and 2016. While there were around 4 thousand newly enrolled doctoral students in 1997, this number has increased and reached around 12,450 in 2016. Moreover, while there were 15 thousand newly enrolled master's students in 1997, this number reached 115 thousand in 2016. However, from time to time there have been sharp declines in the number of newly enrolled master's students. Especially when the need for doctoral graduates is considered, policies to improve enrolment should be developed (see **Chapter B. Highlights**).

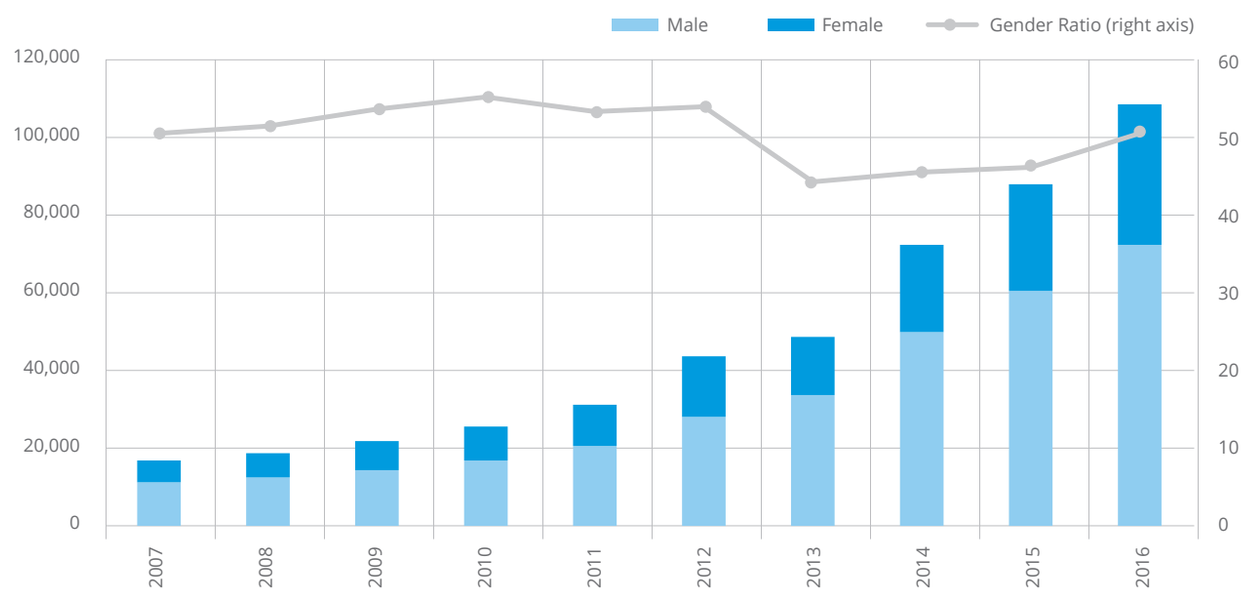
When the continuation rates of bachelor's graduates into master's programs, and master's graduates into doctoral studies are examined (Figure B.7.7) it can be observed that there is no stability. For instance, while the transition rate of master's graduates into doctoral studies was over 50% in 2012, this rate was 26% in 2013 and 29% in 2016. In other words, **there is an absence of a mechanism that equilibrates the supply and demand concerning the transition of bachelor's and master's graduates onto further study.**

INDICATOR B8 NUMBER OF INTERNATIONAL STUDENTS

This indicator will discuss the number of international students in Turkey and the trends in the gender ratios. Furthermore, the number of newly enrolled and graduate international students will also be examined. The student group referred to as "international students" is referred to as "foreign students" in official Turkish statistics.

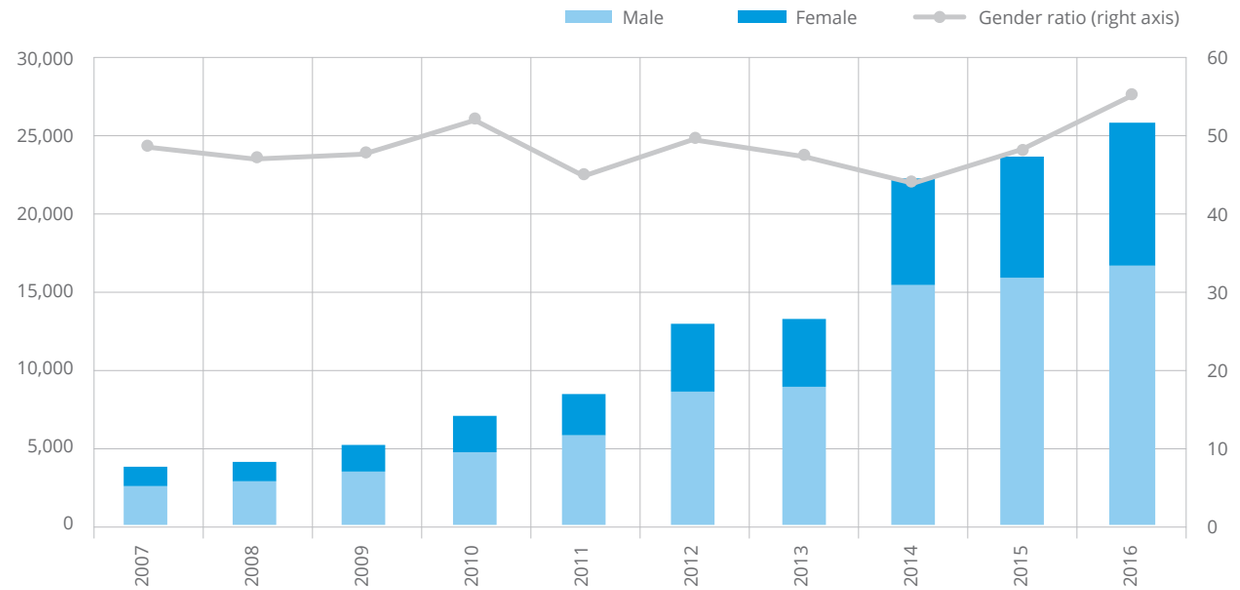
Figure B.8.1 shows the trends in the total number of international students and gender ratios. According to the data, **the number of international students in Turkey has steadily increased between 2007-2016. While there were around 16 thousand international students in 2007, this number has increased substantially over the last 10 years and reaching 108 thousand in 2016.** While the gender ratio was 50.6 in 2007, it has fluctuated over the years and in 2016 stood at 50.4.

Figure B.8.1 Trends in the total number of international students according to gender and gender ratios (2007-2016)



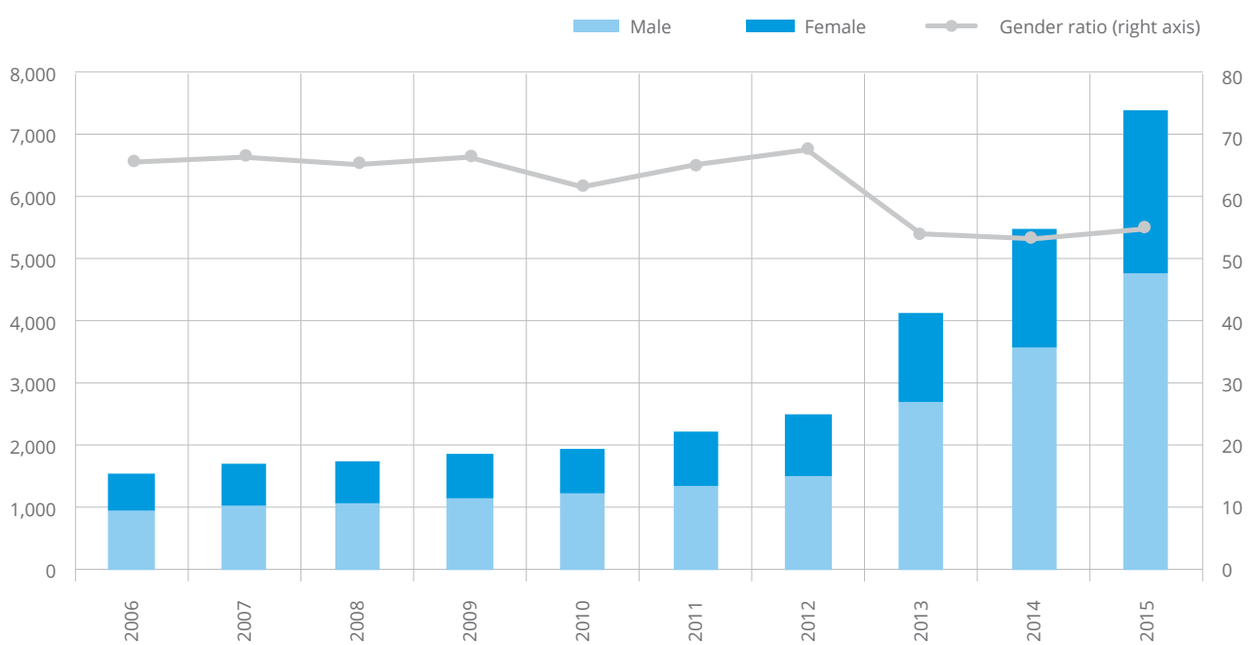
Source: Compiled using the Higher Education Information Management System and ÖSYM data.

Figure B.8.2 Trends among newly enrolled international students according to gender and gender ratios (2007-2016)



Source: Compiled using the Higher Education Information Management System and ÖSYM data.

Figure B.8.3 Trends in international graduates according to gender and gender ratios (2007-2015)



Source: Compiled using the Higher Education Information Management System and ÖSYM data.

Figure B.8.2 shows the trends among newly enrolled international students and gender ratios between the 2007 and 2016. Similar to the total number of students, there was a significant increase in newly enrolled students in the 2007-2016 period. Additionally, there was a major increase in 2014 probably due to a spike in the number of Syrian students. However, there hasn't been a significant change in the gender ratio during the 2007-2016 period. The gender ratio has fluctuated between 44 and 55. According to this, there are half as many newly enrolled female students as there are newly enrolled male students.

Figure B.8.3 shows the trends in the number of international graduates according to gender and gender ratios between the years 2006 and 2015. Similar to newly enrolled students, there are more male graduates than female graduates. Moreover, in the 2013-2015 period the gender ratio has declined to 54-55 from 66. This indicates that for every 100 international student graduates there are 54-55 female graduates.

Table B.8.4 shows the number of international students by country and educational level in the year 2016. According to the table, **the countries with the largest student populations in Turkey are Syria, Azerbaijan, Turkmenistan, Iran, Afghanistan, Iraq, Germany, Greece, Kyrgyzstan and Bulgaria. 75 thousand of the 108 thousand students are studying at the bachelor's level. However, the case of international students from Iran and Iraq is different.** Iranian students who make up 5.6% of all international students also make up 10.2% of international students at the master's level and 24.3% at the doctoral level. Similarly, Iraqi students who make up 4.6% of all international students also make up 13.9% of international students at the master's level and 8.6% at the doctoral level.

Tablo B.8.4 Number of international students by country and education level (2016).

Country	Associate's	Bachelor's	Master's	Doctoral	Total
Syria	1,063	12,467	1,157	355	15,042
Azerbaijan	805	11,485	2,177	411	14,878
Turkmenistan	1,449	8,475	451	43	10,418
Iran	154	2,151	1,942	1,852	6,099
Afghanistan	202	4,079	820	150	5,251
Iraq	60	1,639	2,656	657	5,012
Germany	399	2,944	335	77	3,755
Greece	169	1,869	206	41	2,285
Kyrgyzstan	86	1,251	548	147	2,032
Bulgaria	177	1,701	103	49	2,030
Other	1,635	27,060	8,735	3,844	41,274
Total	6,199	75,121	19,130	7,626	108,076

Source: Compiled using the Higher Education Information Management System.

INDICATOR B9 NUMBER OF DISABLED STUDENTS

This indicator will look at the number of disabled students and examine their distribution according to university, university type, type of disability and gender.

Table B.9.1 Trends in the number of disabled students by type of higher education institution (2014-2015)

Institution type	2014	2015
Public	12,312	12,759
Foundation	1,109	896
Total	13,421	13,655

Source: Compiled using the Higher Education Information Management System.

Table B.9.1 shows trends in the number of disabled students according to higher education institution types in the years 2014 and 2015. There has not been a significant change in these years. However, there has been a decline in foundation higher education institutions. As of 2015 the 13,655 disabled students make up 0.2% of all higher education students. According to a 2015 study conducted by the Turkish Statistical Institute (TURKSTAT), 4 million 883 thousand individuals, 6.6% of the total population, have at least one disability. **When the ratio of disabled individuals among the general population is compared to the ratio of the disabled among all higher education students, it can be observed that people with disabilities have quite low access to higher education.** One factor that partially explains this situation is the fact that the ratio of disabled individuals increases with age. However, despite this, it's evident that this ratio does not do justice to the disabled considering their share of the total population.

Table B.9.2 Number of disabled students by gender and higher education institution type and proportional distribution (2015)

Institution type	Male	%	Female	%	Total	%
Public	8,197	64.2	4,562	35.8	12,759	93.4
Foundation	475	53.0	421	47.0	896	6.6
Total	8,672	63.5	4,983	36.5	13,655	100.0

Source: Compiled using the Higher Education Information Management System.

Table B.9.2 shows the number of disabled students by gender and higher education institution type and their proportional distribution according to 2015 data. The data shows a gender imbalance among disabled students. This situation confirms that disabled females experience the disadvantages of being both women and disabled.

Table B.9.3 Number of disabled students by university and gender (2015)

University Name	University Type	Male	Female	Total
Anadolu University	Public	4,246	2,215	6,461
Ondokuz Mayıs University	Public	461	287	748
İstanbul University	Public	442	204	646
Cumhuriyet University	Public	334	300	634
Abant İzzet Baysal University	Public	244	264	508
Giresun University	Public	299	185	484
Süleyman Demirel University	Public	219	108	327
Kafkas University	Public	158	118	276
İstanbul Aydın University	Foundation	114	77	191
Yeditepe University	Foundation	57	109	166
Other universities		2,098	1,116	3,214
Total		8,672	4,983	13,655

Source: Compiled using the Higher Education Information Management System.

Table B.9.3 shows the number of disabled students by university and gender in the 2015-2016 academic year. According to the table 47.3% of disabled students in the higher education system study in Anadolu University. **This is because t universities which offer face-to-face education do not have disability friendly campuses, classrooms and dorms. Another factor is that the Open Education Faculty of Anadolu University provides distance education which is preferred by disabled students.** Since there are more disabled male students than female students in most universities this shows that gender balance has not yet been achieved.

Table B.9.4 Number of disabled students according to type of disability and gender (2015)

Disability type	Male	Female	Total
Physical impairment	3,459	2,021	5,480
Visual impairment	2,628	1,326	3,954
Impaired hearing	726	519	1,245
Chronic health conditions	368	269	637
Psychological problems	55	26	81
Language and speech problems	43	18	61
Mental impairment	36	14	50
Attention deficit disorder (hyperactivity)	33	16	49
Asperger's or high functioning autism	16	18	34
Temporary deficiencies	8	7	15
Learning impairment	10	4	14
Other disabilities	1,290	745	2,035
Total	8,672	4,983	13,655

Source: Compiled using the Higher Education Information Management System.

Table B.9.4 shows the number of disabled students according to type of disability and gender in 2015. According to this, the most common disability types are physical impairments, visual impairments, chronic health problems and psychological problems. The types of disabilities facing students studying in Anadolu University also present a similar picture (Table B.9.5).

Table B.9.5 Number of disabled students at Anadolu University according to type of disability and gender (2015)

Disability type	Male	Female	Total
Physical impairment	2,234	1,277	3,511
Visual impairment	1,910	840	2,750
Impaired hearing	64	64	128
Chronic health conditions	30	29	59
Language and speech problems	1	0	1
Other disabilities	7	5	12
Total	4,246	2,215	6,461

Source: Compiled using the Higher Education Information Management System.

Table B.9.5 shows the number of disabled students studying in Anadolu University according to type of disability and gender. According to the table, the most common disability types for both males and females are physical impairments, visual impairments, hearing impairments, and chronic health problems.

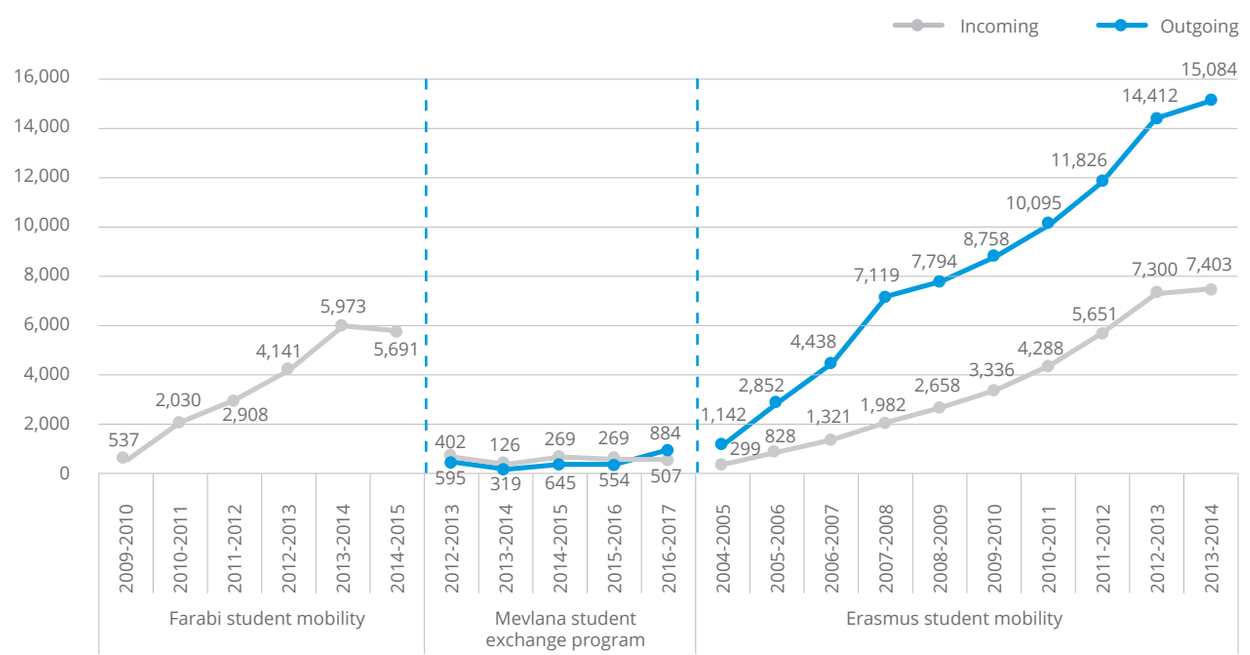
INDICATOR B10

NUMBER OF STUDENTS WHO PARTICIPATED IN EXCHANGE PROGRAMS

This indicator will examine the number of students who participated in the Farabi, Mevlana and Erasmus exchange programs. Farabi is a domestic exchange program administered by BHE. Mevlana is a foreign exchange program supported by BHE. Erasmus on the other hand is a foreign exchange program that is supported by the European Union. This section will only cover student exchanges and not the faculty exchanges within the context of Farabi, Mevlana and Erasmus.

Figure B.10.1 shows the trends in the number of students who participated in different exchange programs established by agreements between universities in various years. According to the figure, there has been a general increase in the number of Farabi and Erasmus exchange students. The number of students who went to Europe through the Erasmus exchange program was over 15 thousand in 2013, while the number of students participating in the Farabi domestic exchange program was 5,700 in 2014. As of 2016, the Mevlana exchange program has supported 507 incoming and 884 outgoing students. **The Farabi exchange program has not been popularized to the same extent as Erasmus in terms of scale and the Mevlana program has not become as prevalent as Erasmus and Farabi programs.**

Figure B.10.1 Trends in incoming-outgoing exchange students



Source: Compiled by using the Board of Higher Education (BHE) data.

CHAPTER B

HIGHLIGHTS

The higher education system in Turkey has experienced a large expansion in recent years. **While there were about 335 thousand students in 1983 this number increased more than 20 times 7 million 200 thousand (see Figure B.1.1).** The new capacity generated by the establishment of new universities in 2006 and thereafter, the increase in the quotas of old universities particularly after 2008, the abolishment of tuition fees, the fact that there are no quota limitations in open education and that quotas are too high have led to a much more rapid growth in higher education (Arlı, 2014; Çetinsaya, 2014; Günay and Günay, 2011; Özoğlu, Gür and Gümüş, 2016; Tekneci, 2016). In addition to this, the number of students in foundation universities grew from 139 thousand in 2007 to over 550 thousand in 2016 reaching a significant size. In other words, although public universities were the primary source of the growth in higher education, foundation universities which also experienced significant growth over the last 10 years now have a share of more than 15% of face-to-face education in Turkey (see Figure B.3.4). It is crucial for foundation universities to increase their share of the education system because this reduces the state's financial burden and introduces competition into the higher education system (Ergüder, 2015). Within this framework the differentiation between higher education institutions in terms of their offerings and specializations increases providing students and faculty with more options.

When the trends in the total number of students according to gender and gender ratios are reviewed there is a shift in favour of female students can be observed (see Figure B.1.2). While there were about 10 female students for every 20 male students, at the end of the 1990s, there were 13 female students for every 20 male students in the early 2000's, and since 2010 there have been around 17 female students for every 20 male students. **Although over the years the disparity between the number of female and male students has decreased significantly, the disparity still persists.** However, the graduation rates demonstrate a shift in favour of female students. More explicitly, for every 20 male students graduating from bachelor's programs there are 24 female students and for every 20 male students graduating from associate's degree programs there are 19 female students (see Figure C.2.2). Moreover, the schooling rates for ages 18-22 demonstrate that the schooling rate gap between male and female students has closed completely and that female schooling rates have actually surpassed male schooling rates. **Between 1997 and 2015, there were substantial increases in the schooling rates of female and male students in the 18-22 age group and the schooling rate for males during this time was 39.2% compared to 42.6% for female students** (see Figure B.2.2).

It can be stated that Turkey has increasingly popularized its higher education system especially following the period after 2008. In fact, in Martin Trow's words **Turkish higher education has become a universal system since gross schooling** rates have surpassed the 50% level (Günay and Günay, 2011; Gür, 2016). Although Turkey's gross schooling rates have surpassed countries like England, Russia and France and have reached the same level as the U.S (see Figure B.2.3), half of higher education students in Turkey are registered in open education programs. This clearly in-

dicates the need to increase face-to-face education opportunities. **The share of open education programs within the higher education system in Turkey is significantly higher than other OECD countries** (Çetinsaya, 2014).

When the total number of students according to level of education (associate's, bachelor's, graduate) and education type (face-to-face and open education) is examined, the most striking finding besides the expansion of the system is the fact that the open education system which was initially established as a solution to the increase in demand in the 1980s (BHE, 2007) has overtime become half as big as the entire higher education system (see Figure B.1.3). **Half of all associate's and bachelor's students in Turkey's higher education system are in open education programs (see Figure B.6.2). These numbers are 47% at the bachelor's level and 54% at the associate's level.** Indeed, open education, which was initially established due to an inadequate capacity in face-to-face education, has reached a massive size of more than half of the education system. It is understandable that open education has grown. In the 1980s and 1990s, there were only between 30 to 50 universities in Turkey. Therefore, considering that since the 2010s there are over 170 universities in Turkey the fact that half of all students are in open education programs raises some questions. This has a negative impact on both the image and prestige of the Turkish higher education system.

Despite the establishment of new universities, open education has continued to grow rather than shrink. The striking development here is that the increase in the total number of open education students is much greater than the increase in the total number of bachelor's students receiving a face to-face education. Indeed, while it is more reasonable to scale down the open education system, parallel to its growth, both at the associate's and bachelor's level (BHE, 2007; Çetinsaya, 2014; Günay and Özer, 2016), as of 2017 there has been no comprehensive policy initiative towards this end.

Evening education programs have played an important role in the Turkish higher education system in increasing access to higher education at both the associate's and bachelor's level since 1992. While the evening education system is considered beneficial due to increased access and the more efficient use of physical infrastructure, it is also being criticized for increasing the teaching load of academic staff members and therefore reducing their research and publishing performances (BHE, 2007; Çetinsaya, 2014). When evening education programs are evaluated in consideration of the capacity issue, they serve an important function in terms of providing higher education to large masses of people. Evening education programs which are mostly funded by student tuition fees are also financially advantageous because they do not impose additional burdens on the state and higher education institutions. While evening education made up approximately 17% of the total number of associate's and bachelor's students in 1997, this number increased to between 23% and 27% in the 2010s (see Figure B.5.3). In other words, students in evening education programs make up around one fourth of the higher education system at the associate's and bachelor's level. Thus the evening education programs which were originally established to provide additional capacity became increasingly entrenched within the system. As of 2016 the share of newly enrolled evening education students in the system (23%) shows great similarity to the share of evening education students among all students (23%) (see Figure B.5.4). In other words, **although the share of eve-**

ning education students within the system has declined in recent years it continues to be quite high.

When the trends in gender ratios according to type of education are examined, it is clear that face-to-face and distance education programs have experienced the most improvements in terms of gender ratios (see Figure B.4.4). While the gender ratio for face-to-face and distance bachelor's education was 67 in 1997, this number reached 98 in 2016 and gender parity has since nearly been achieved. However, **as of 2016 the gender ratios of evening education associate's programs (50) and distance education associate's programs (70) and evening education bachelor's programs (74) has been relatively low.** According to BHE, the main reason for this is that there is an unfavourable situation for female students in evening education which costs families relatively more. Nevertheless, the gender ratios of foundation university programs which costs much more than evening education programs suggest that this financial explanation is not necessarily valid. Indeed, as of 2016 while the gender ratio of foundation higher education institutions is around 94, the ratio for public universities is 79 (see Figure B.3.5). This could be linked to female students preferring foundation higher education institutions or foundation higher education institutions having more programs that attract females. Furthermore, this may also be linked to the fact that half of foundation higher education institutions are in Istanbul and the other half in other metropolitan areas. Whatever the reason may be, the situation in foundation higher education institutions is favourable to females and deserves further study. The higher gender ratio in favour of males in evening education programs may be partially linked to working males, particularly preferring these programs because of their schedules and females not preferring to study in evening programs.

When the trends in the number of newly enrolled students are examined, it can be observed that the number of newly enrolled associate's, bachelor's and graduate students have generally increased (see Figure B.1.4). As of 2016, 344 thousand associate's students, 480 thousand bachelor's students and 128 thousand graduates have enrolled in new programs adding up to over 950 thousand. On the other hand, while the number of newly enrolled students was 145 thousand in 1997 and 581 thousand in 2015 this number went down to 482 thousand in 2016. It is important to highlight two important issues here. First, new enrolments in open education have reached record high levels particularly since 2013, despite the expectation that as the higher education system expands and new capacity is generated that there would be less enrolment in open education. Second, although there have been significant improvements in new enrolments at the associate's and bachelor's level, new graduate enrolments have been relatively modest. Both of these issues demand policy measures.

Within the framework of secondary university attendance without an entrance examination, in the 2016-2017 academic year there are 360 thousand students in Anadolu University, 104 thousand in Atatürk University and 49 thousand in Istanbul University totalling 513 thousand students (see Table B.6.5). **The number 513 thousand can be better appreciated when considered within the total number of students at the associate's and bachelor's level in Turkey which is around 6 million as of 2016.** The large number of students in their second university program can be seen as related to the fact that individuals from all age groups have more opportunity due to increased access to higher education in the recent years, it can also be related to higher education graduates

not being able to find a good job in the labour market and therefore pursuing a second diploma. The fact that the average age of students in the second university without an entrance exam program has fallen to 34 shows that the open education system is increasingly preferred by younger graduates. This could be linked to new graduates wanting to gain an advantage in the labour market or fresh graduates wanting to create an alternative to their first diploma since they were unable to find a good job. In addition to this, there are students who are already enrolled in a higher education institution that are also enrolled in open education programs within the second university framework. This seems to be related to the students concern that their face-to-face education program diploma may not be sufficient in the labour market and/or to the possibility that they have other interests that they'd like to pursue.

The number of graduate students has generally increased between 1983 and 2016 excluding certain years (see Figure B.7.1). While there were 13 thousand graduate students in 1983, this number reached 73 thousand at the end of the 1990s, 182 thousand at the end of the 2000s, and in 2016 has surpassed 571 thousand. **The increase in the number of graduate students has been due to the increase in master's students rather than the increase in doctoral students.** While there were around 4 thousand doctoral students in 1983, this number reached 91 thousand in 2016. However, from time to time there have been sharp declines in newly enrolled master's students (see Figure B.7.6). **It is not possible to say upward consistency has been achieved for the number of new graduate enrolments.** The main reason for this is that there is no existing planning or coordination mechanism in Turkey concerning the number of graduate students. Indeed, when the continuation rates of bachelor's and master's students into further studies in the 1997-2016 period (see Figure B.7.7) are examined it can be observed that stability has not been achieved over the years.

The gender ratio, which was 47 at the doctoral level in 1983, has fluctuated over the years and reached 70 in 2016. While the gender ratio at the master's level was 52 in 1983 this increased to 63 in 2016 (see Figure B.7.2). **The changes in the gender ratio have been unfavourable for female students particularly after 2008.** The main reason for this is that female students, who were relatively well represented at the bachelor's level, tend to begin their family or work life at the same period in which they would do their master's or doctorates and therefore don't prefer master's or doctoral studies as much as males do.

The number of international students in Turkey has steadily increased between 2007 and 2016. **The scholarships provided by the Administration for Turks Living Abroad and Related Communities, the increasing number of Syrian students in Turkey, the efforts of BHE and universities have all played a role in this increase** (Çetinsaya, 2014; Kalkınma Araştırmaları Merkezi, 2015; Özoğlu, Gür, ve Coşkun, 2015). It should also be noted that education and living expenses in Turkey are significantly less than European countries. This makes Turkey a reasonable alternative for students who want to receive a cheap and quality education outside their country.

There are 13,655 disabled students in Turkey as of 2015 and this makes up about 0.2% of the total number of higher education students. **When the share of disabled students within higher**

education is compared to the share of persons with disabilities within the general population is compared, it can be seen that the disabled have quite restricted access to higher education. 47.3% of disabled students in the higher education system are enrolled at Anadolu University (see Table B.9.3). When it is considered that open education students do not have to travel to the university campus on a daily basis, it is understandable that nearly half of all disabled students prefer Anadolu University. However, this situation results from necessity rather than choice. In other words, **it is expected that students with disabilities would likely prefer campuses that provide face-to-face education if these campuses were to become disability friendly.**

The Farabi program has not become as prevalent as Erasmus in terms of scale and Mevlana is not as popular as Farabi and Erasmus (see Figure B.10.1).

RECOMMENDATIONS

- **Since the demand for higher education is high in Turkey and remains to be met, the expansion of the higher education system should be continued.** In this context the share of open education within the higher education system should be scaled down (BHE, 2007; Çetinsaya, 2014). In other words, in order to increase the overall average quality of the higher education system and meet the demand for higher education, opportunities for face-to-face education should be improved. Furthermore, the share of foundation higher education institutions should be increased since these institutions reduce the burden on government finances and increase differentiation and competition between higher education institutions. Additionally, policies aiming to make higher education more widespread should be extended and these policies should be implemented in consideration of both national and global needs (Kavak, 2011).
- Considering that evening education was a supplemental solution that arose due to the inadequacy of campus infrastructure, existing higher education institutions should improve their capacities and new universities should be established. In this context, **the goal should be to transform evening education programs into day time programs overtime.**
- Considering Turkey's need for more faculty members and the needs of the research and development-based labour market, mechanisms for planning and coordinating the number of graduate students in Turkey should also be established. **Considering Turkey's need for faculty members the number of annual doctoral graduates should be increased from 5 thousand to 15 thousand until 2023** (BHE, 2007; Çetinsaya, 2014). Measures should be taken to increase the number of newly enrolled female students in order improve the gender ratio which is currently unfavourable for females.
- The reasons behind the fact that almost half a million students are participating in the second diploma program to attain a second college diploma should be subject to extensive research. Such research would provide valuable insight on the programs that these students graduated from and will shed further light on the status of graduates in the job market. Therefore, these types of studies can help guide the remodeling of higher education programs.
- **Measures should be taken to make campuses more disability friendly in order to increase the number of disabled students in higher education institutions.**
- Measures should be taken in order to increase the functionality and wider range accessibility of the Farabi and Mevlana exchange programs

CHAPTER B

REFERENCES

Altbach, P. G. (2007). Introduction: The underlying realities of higher education in the 21st century. P. G. Altbach & P. Peterson (Ed.), *Higher Education in the New Century: Global Challenges and Innovative Ideas* (pp. xvii–xxiv). Rotterdam: Sense Publishers.

Arlı, A. (2016). Yükseköğretimde büyüme, farklılaşma ve reorganizasyon: İstanbul örneği (1980-2015) [Growth, diversification and reorganization in higher education: The Istanbul case (1980-2015)] *Sosyoloji Konferansları*, (54), 199–243.

BHE. [YÖK] (2007). *Türkiye'nin yükseköğretim stratejisi* [Turkey's higher education strategy]. Ankara: Yükseköğretim Kurulu.

Çetinsaya, G. (2014). *Büyüme, kalite, uluslararasılaşma: Türkiye yükseköğretimi için bir yol haritası* [Growth, quality, internationalization: A roadmap for Turkish higher education] Eskişehir: Yükseköğretim Kurulu.

Ergüder, Ü. (2015). *Yükseköğretimin fırtınalı sularında* [On the troubled waters of higher education]. İstanbul: Doğan Kitap.

Günay, D., & Günay, A. (2011). 1933'ten günümüze Türk yükseköğretiminde niceliksel gelişmeler [Quantitative developments in Turkish higher education since 1933]. *Yükseköğretim ve Bilim Dergisi*, 1(1), 1–22.

Günay, D., & Özer, M. (2016). Türkiye'de Meslek Yüksekokullarının 2000'li yıllardaki gelişimi ve mevcut zorluklar [The development of Postsecondary Vocational Schools in Turkey in the 2000s and current challenges]. *Yükseköğretim ve Bilim Dergisi*, 6(1), 1–12.

Gür, B. S. (2016). *Egemen üniversite: Amerika'da yükseköğretim sistemi ve Türkiye için reform önerileri* [The dominant university: Higher education system in the US and reform suggestions for Turkey]. İstanbul: EDAM

Kalkınma Araştırmaları Merkezi. (2015). *Yükseköğretimin uluslararasılaşması çerçevesinde Türk üniversitelerinin uluslararası öğrenciler için çekim merkezi haline getirilmesi* [Making Turkish universities attractive for international students in the context of the internationalization of higher education]. Ankara: Kalkınma Bakanlığı.

Kavak, Y. (2011). Türkiye'de yükseköğretimde büyüme: Yakın geçmişe bakış ve uzun vadeli (2010-2050) büyüme projeksiyonları [Growth in Turkish higher education: Examination of the recent past and long term (2010-2050) growth projections]. *Yükseköğretim Dergisi*, 1 (2), 95–102.

OECD. (2016a). *Education at a glance 2016: OECD indicators*. Paris: Organisation for Economic Co-operation and Development.

OECD. (2016b). *OECD science, technology and innovation outlook 2016*. Paris: Organisation for Economic Co-operation and Development.

OECD. (2017). *The state of higher education 2015-16*. Paris: Organisation for Economic Co-operation and Development.

Özoğlu, M., Gür, B. S., & Coşkun, İ. (2015). Factors influencing international students' choice to study in Turkey and challenges they experience in Turkey. *Research in Comparative and International Education*, 10 (2), 223–237. https://doi.org/10.1177/1745499915571718

Özoğlu, M., Gür, B. S., & Gümüş, S. (2016). Rapid expansion of higher education in Turkey: The challenges of recently established public universities (2006–2013). *Higher Education Policy*, 29 (1), 21–39. https://doi.org/10.1057/hep.2015.7

Tekneci, P. D. (2016). Evolution of Turkish higher education system in the last decade. *Yükseköğretim ve Bilim Dergisi*, 6(3), 277–287.

TURKSTAT. (2015). *Dünya nüfus günü, 2015* (Haber Bülteni No. 18617) [World population day, 2015 (News bulletin no. 18617)]. Ankara: Türkiye İstatistik Kurumu. http://www.tuik.gov.tr/PreHaberBultenleri.do?id=18617

UNESCO. (2017). UNESCO Institute for Statistics. http://uis.unesco.org

CHAPTER C

OUTPUTS OF EDUCATION

Today, higher education graduates are the segment of the population who make a difference, have the capacity to produce services/products with high added value and the potential to contribute the most to a country's economy. In this respect, the higher education output provides prominent data on the country's probable economic structure, job market and quality of the workforce. In order to assess the performance of the higher education system in Turkey, the higher education output must be analysed.

It would prove useful to explain how certain concepts and indicators in this chapter are defined and calculated. The concept of educational attainment is one of the variables that assess the population's level of education; it indicates the highest level of education completed. A country's educational attainment ratio expresses the country's overall performance in terms of education. The trends in educational attainment provide insight on the performance and success of educational policies that have been implemented (Eğitim-Bir-Sen, 2016). Furthermore, in this chapter, short-cycle tertiary, bachelor's and master's degrees along with doctorate programs were included in the completed levels of education. The calculation of master's degree graduates, in accordance with ISCED, was based on the graduates of master's degree programs and institutions which provide education for at least 5 years.

Other important concepts that should be defined are **workforce, employment and unemployment** ratios. The labour force consists of both employed and unemployed persons who are eligible for employment in terms of age. The age range for employment is considered as 15-64. The labour force participation rate is calculated as follows: 100 x (unemployed + employed population) / total population eligible for employment. Employment rate is 100 x (employed population) / total population eligible for employment. The equation for the unemployment rate, on the other hand, is 100 x (unemployed population) / total population eligible for employment. As a part of the European Union harmonization process, standards for calculation which were determined by Eurostat were adopted by the Turkish Statistical Institute (TURKSTAT) in February 2014. In this respect, statistical calculations rely on a sequence that can take weeks as a point of reference. In order to converge on Eurostat standards regarding unemployment and job seeking, the previous criteria of "last 3 months" was replaced with "last 4 weeks." TURKSTAT (2017) defines the unemployed as "currently unemployed persons who are eligible for employment, that have used at least one of the existing channels to try find a job in the last 4 weeks and that are ready to start work within 2 weeks." Another change that affects the statistics on unemployment is the inclusion of the rural areas in cities that are considered as metropoles.

In this chapter, the analysis of the higher education system's outputs is done in order to assess the overall performance of the higher education system in Turkey. Outputs are categorized as academic and economic. In academic outputs, indicators regarding the population's level of education and graduation status from higher education are indicated. Meanwhile, in economic outputs, indicators of higher education graduates' public employment, indicators of education and the labour force market along with economic revenues are analysed.

INDICATOR C1 POPULATION'S LEVEL OF EDUCATION

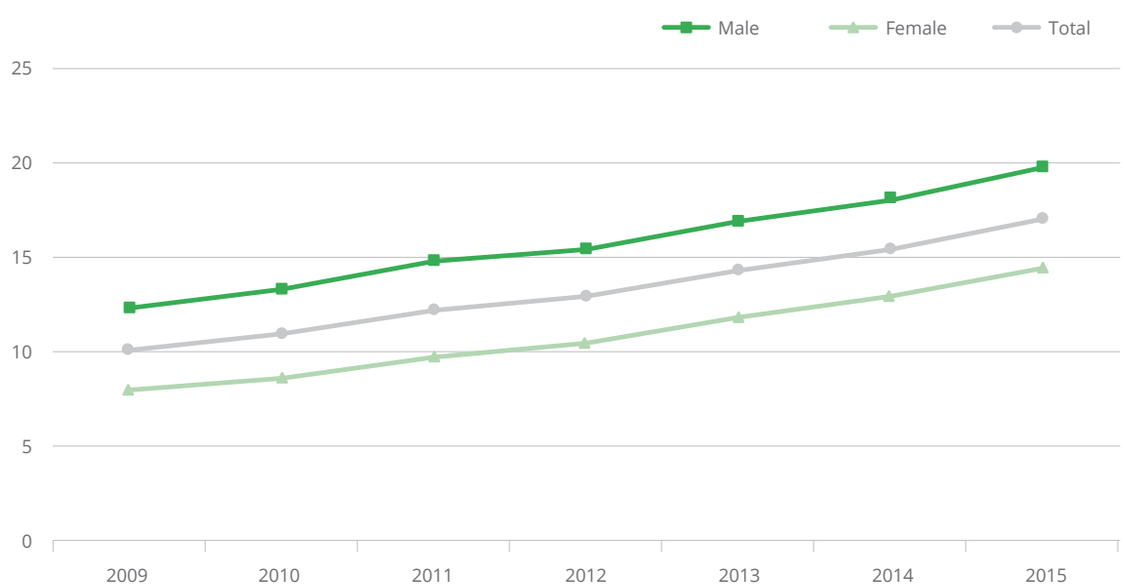
As previously stated, the concept of educational attainment expresses the highest completed level of education. In this section, short cycle tertiary's, bachelor's and master's degrees along with doctorates are considered as completed levels of education. In this respect, the rate of educational attainment in different age and gender groups in Turkey and their trends over time are analysed on a regional and provincial basis.

The trends in the rate of higher education graduates over the age of 25 between 2009-2015 according to gender are shown in Figure C.1.1. According to the graph, there is a swift increase in the rate of higher education graduates between 2009-2016. The rate of higher education graduates over the age of 25 was 10% in 2009. In terms of gender, the rate of higher education graduates among females was 8% and among males 12%. This rate has increased to a total of 17% in 2015; while the female's rate rose to 14%, the male's rate rose to 20%. Despite the rather swift increase in the female higher education graduation rate, males have a higher rate.

The rate of higher education graduates between the age of 25-64 in OECD countries in 2015 are shown in Figure C.1.2. The rate of higher education graduates has also increased in OECD countries within the same time span (OECD, 2016). Even though Turkey has progressed significantly in terms of its rate of higher education graduates, it is still lagging far behind the OECD average. **While the rate of higher education graduates between the age of 25-64 is 18% in Turkey, the average of OECD countries is 36%.** In other words, the OECD average is double Turkey's rate. The rate of higher education graduates is over 50% in Canada, Russia and Japan, while it is close to 50% in the US, UK and South Korea. On the other hand, Italy and Mexico's rates are lower than Turkey's.

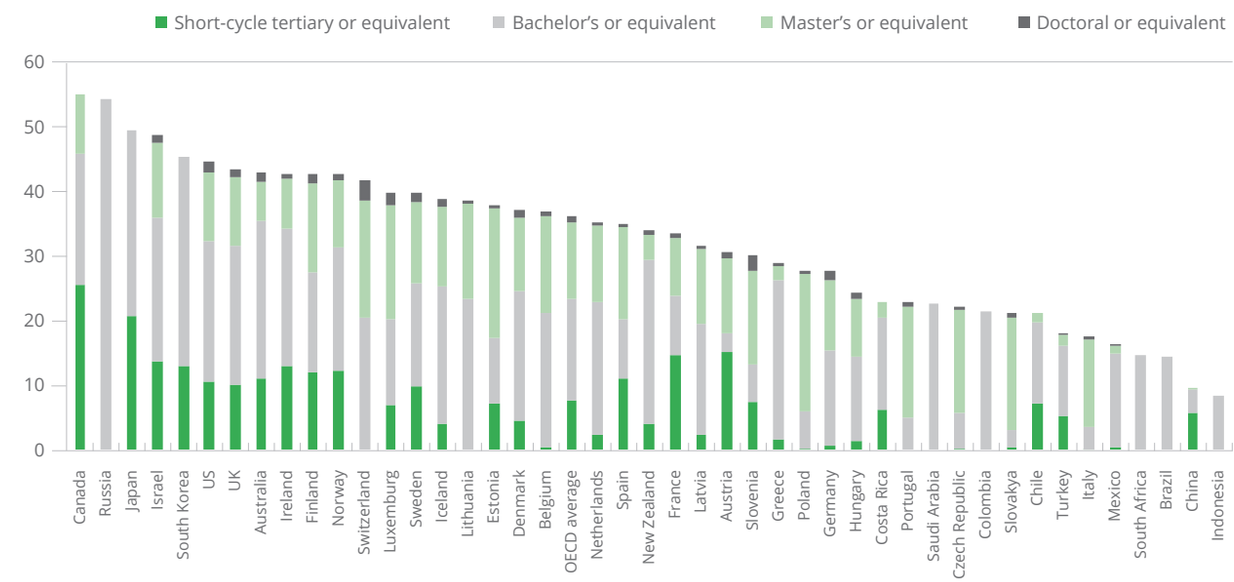
The rate of higher education graduates in 2015 according to age and gender groups is shown in Figure C.1.3. **According to the graph, both males and females have higher rates of higher education graduates in lower age groups.** In regards to age groups, there is a sharper

Figure C.1.1 Trends in the rate of higher education graduates 25+ year-olds, by gender (%) (2009-2015)



Source: Compiled using TURKSTAT National Education Statistics Database.

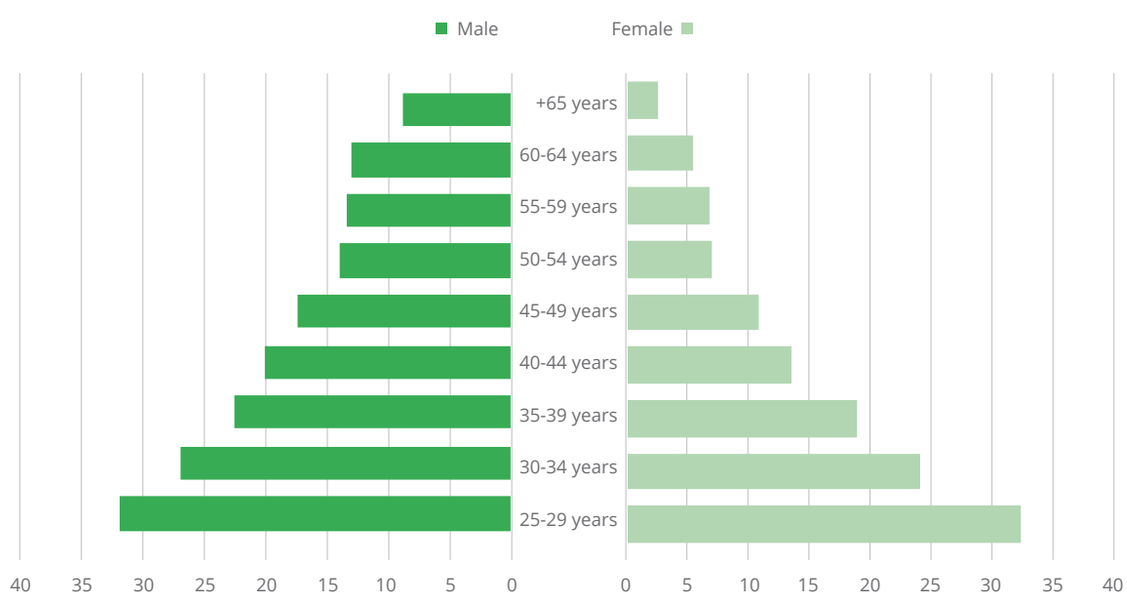
Figure C.1.2 Percentage of 25-64-year-olds with higher education in OECD and G20 countries (%) (2015)



Source: OECD (2016)

increase in the female rate of higher education graduation in comparison to male's. Moreover, considering the 25-29 age group, the female rate of higher education graduation (32.4%) is higher than the male's (31.9%). Starting from the age group 30-34, males can be seen as having higher rates of higher education graduates in comparison to females and the gap between male's and female's rates increase. The reasons for the increase in the rate of higher education graduates can be attributed to the expansion of higher education institutions, the fact that university graduates earn

Figure C.1.3 Higher education graduation rate, according to age and gender (%) (2015)



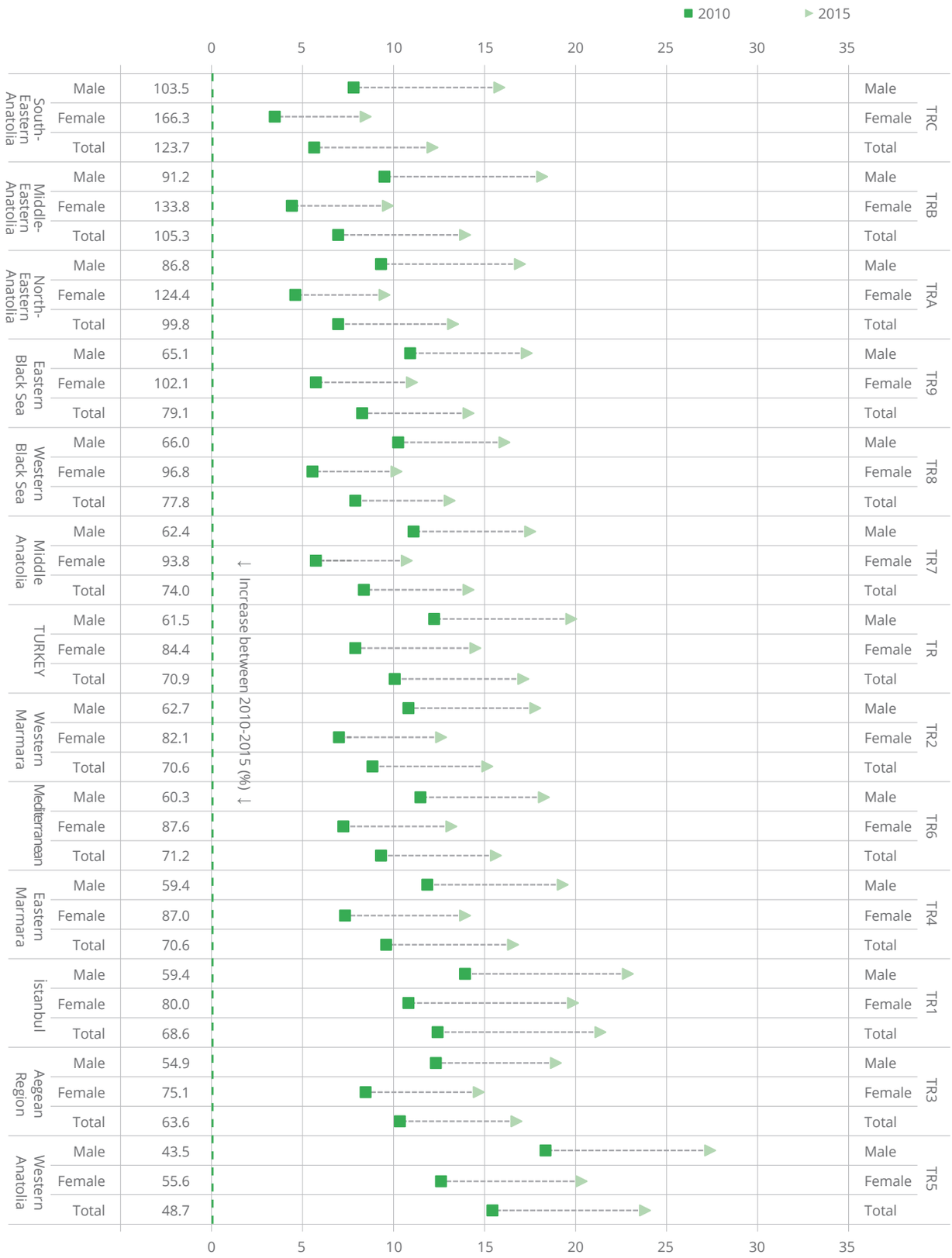
Source: Compiled using TURKSTAT National Education Statistics Database.

more than primary and secondary education graduates, the removal of tuition fees in public universities and the increase in the demand for higher education (Eğitim-Bir-Sen, 2016). Furthermore, because of female's increasing higher education participation rate and their tendency to be more successful than males, females have a higher rate of higher education graduates in the 25-29 age group (see **Chapter B: Access and Participation to Higher Education**).

Trends in the rates of higher education graduates aged 25 years and up by region and gender between 2010-2015 are shown in Figure C.1.4. According to the data, there is a significant increase in the rate of higher education graduates in all regions, regardless of gender, between 2010 and 2015. The highest increase in the rate of higher education graduates occurred in South-eastern Anatolia; the rate has increased 124% in total over the course of this period, male and female rates showed an increase of 104% and 166% respectively. Meanwhile, in general, the rate increased by 71% in Turkey, the rate for males showed an increase of 62% and for females 84%. The increase in Middle-eastern Anatolia was 105% in total, 91% in male's and 134% in the female's rate. In Western Anatolia, the rate of higher education graduates has shown an increase of 49% in total, 44% among males and 56% among females; in the Aegean region, on the other hand, the rate increased by 64% in total, male and female rates increasing 55% and 75% respectively. In this respect, Western Anatolia and Aegean regions which have higher schooling and graduation rates in higher education have shown an increase that is below Turkey's average rate of higher education graduates between the years 2010-2015.

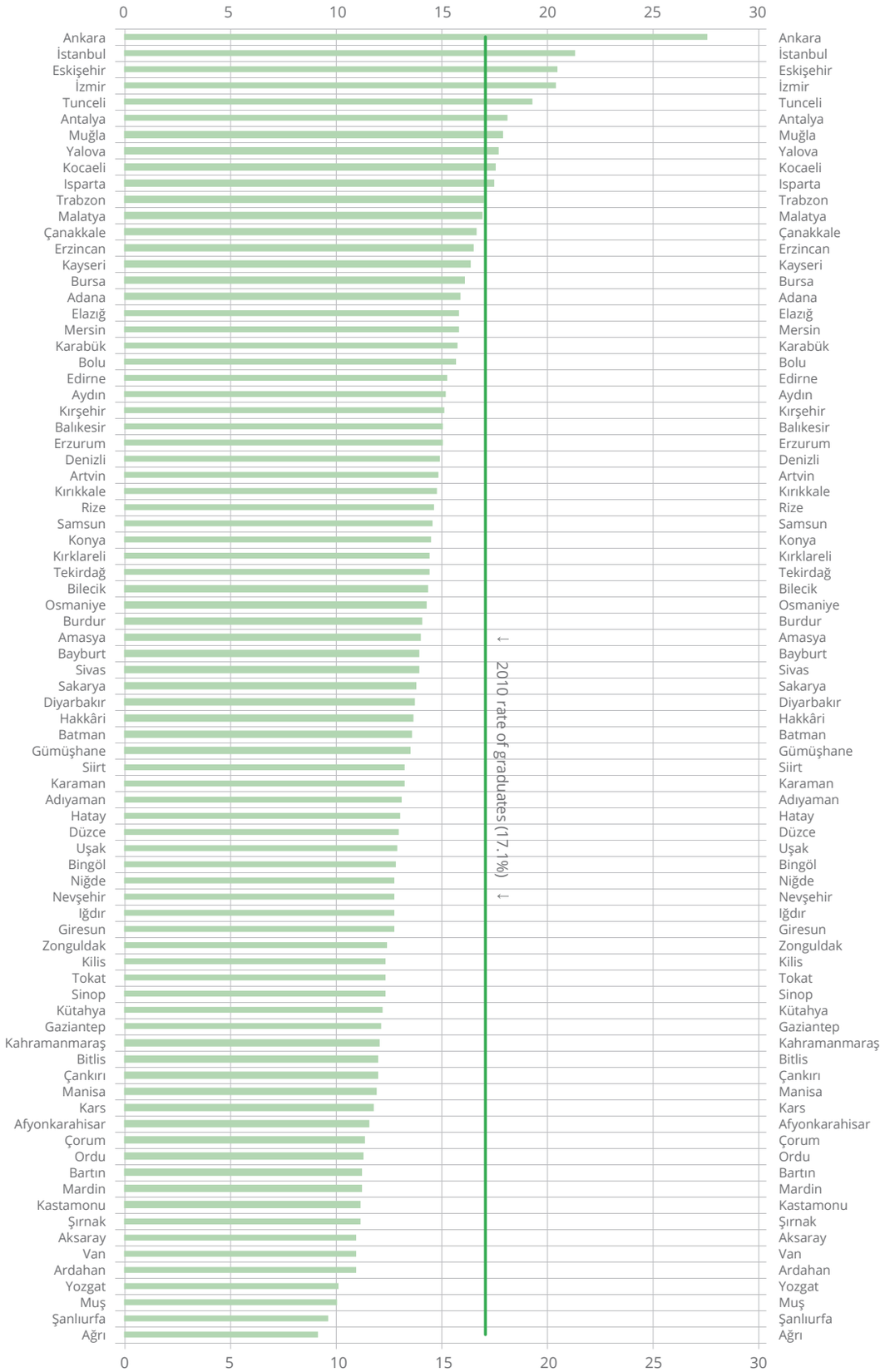
The rate of higher education graduates 25+ year-old according to 2015 data is shown in Figure C.1.5. The data indicates that the highest graduation rate from higher education for people over the age of 25 is in Ankara. The higher education graduate rate in Ankara is 27.6%. Ankara is followed by Istanbul (21.3%), Eskişehir (20.5%) and İzmir (20.4%). **Except Eskişehir, it can be seen that the highest higher education graduate rates are in Turkey's three largest cities.** While cities in Eastern Anatolia have lower graduation rates from higher education, Tunceli is a striking exception; with a 19% rate of higher education graduation, Tunceli has the fifth highest rate in Turkey. Cities like Antalya, Muğla, Yalova, Kocaeli, Isparta and Trabzon have higher education graduation rates similar to Turkey's overall average which is 17%. **Only 11 cities have rates that are either equal or higher than Turkey's average rate of higher education graduates, while the remaining 70 cities have lower than average rates.** On the other hand, the cities of Yozgat, Muş, Şanlıurfa and Ağrı have higher education graduation rates below 10%. In general, the rates of higher education graduates in most cities of South-eastern Anatolia, Eastern Anatolia and Middle Anatolia are well below those in Turkey's western cities.

Figure C.1.4 Trends in the 25+ year-old higher education graduation rate, by region and gender (%) (2010-2015)



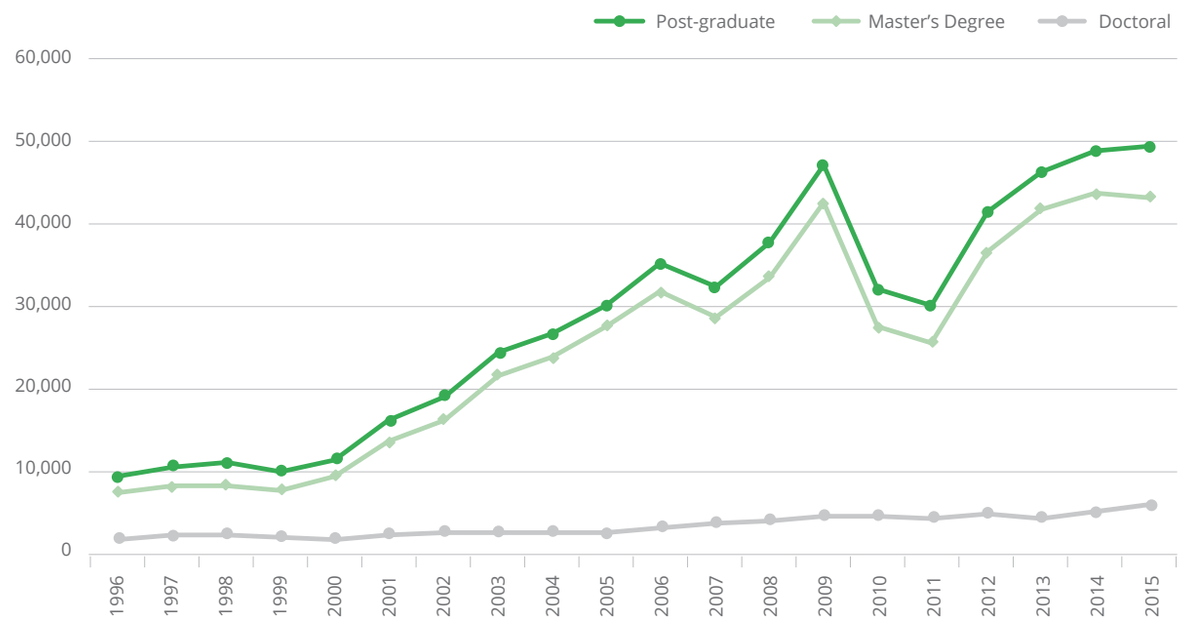
Source: Compiled using TURKSTAT National Education Statistics Database.

Figure C.1.5 25+ year-olds higher education graduation rate, by city (%) (2015)



Source: Compiled using TURKSTAT National Education Statistics Database.

Figure C.1.6 Trends in the number of post-graduate education graduates, by level of education (1996-2015)

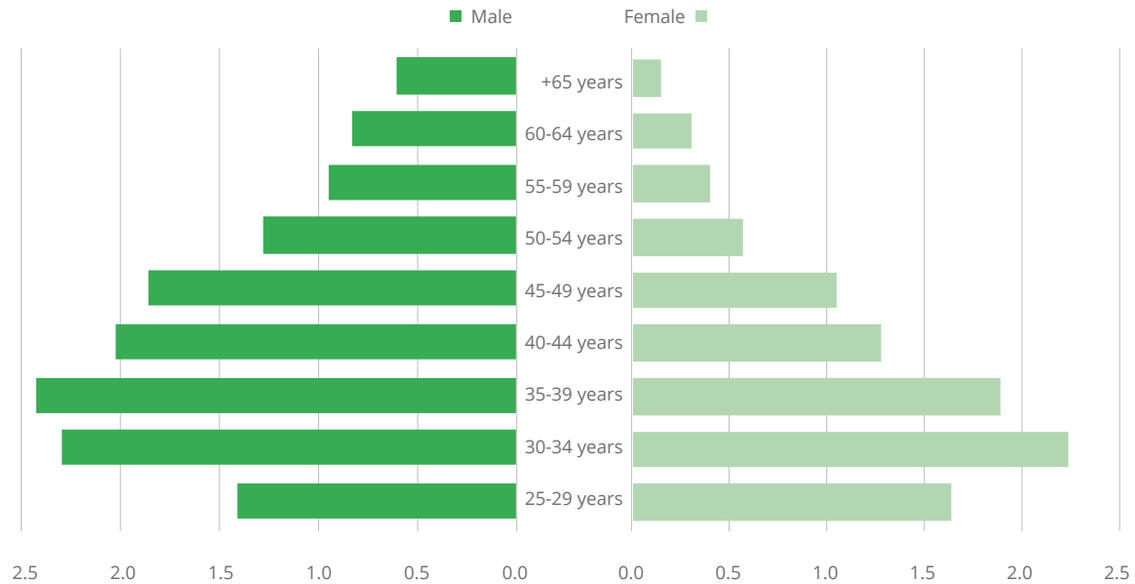


Source: Compiled using Higher Education Information Management System and ÖSYM data.

Trends in the number of post-graduate education graduates according to their level of education between the years 1996-2015 is shown in Figure C.1.6. According to the graph, even though there are fluctuations in the number of master's program graduates, the number has increased significantly from 7,000 to 43,000 within the given period of time. Doctorate graduates, on the other hand, increased steadily from 1,800 to around 6,000. Yet, as it is to be discussed in the following indicators, **considering Turkey's need for faculty and international norms, Turkey is experiencing a significant deficit in terms of the number of doctorate graduates** (Figure C.1.13).

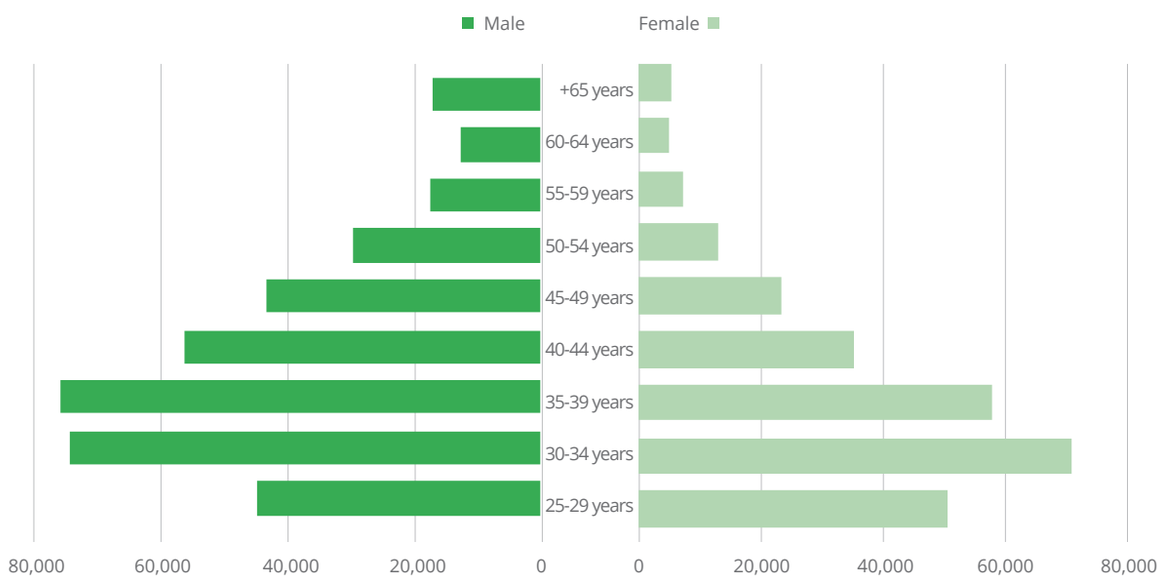
The rate of master's program graduates in 2015, by age group and gender is shown in Figure C.1.7. In this calculation, in accordance with ISCED 7, only master's or equivalent degrees which provide at least 5-year higher education degrees were included. According to this data, among males, the rate of master's program graduates in the 25-29 age group (1.4%) is lower than the following age groups: 30-34 (2.3%), 35-39 (2.4%), 40-44 (2%) and 45-49 (1.9%). Among females, on the other hand, the 30-34 age group (2.23%) is the highest in terms of master's graduates. With the exception of the 25-29 age group, the rate of master's graduates declines as the age increases. This might be due to the fact that part of the males and females within the 25-29 age group have ongoing studies in their master's degree. When the rates of master's graduates are compared according to gender, it can be seen that females (1.64%) have higher rates than males (1.41%) in the 25-29 age group. Meanwhile, in the 30-34 age group, males (2.29%) have a slightly higher rate than females (2.23%). As age increases, the gap between females and males in terms of master's graduation rates widens.

Figure C.1.7 Master's graduation rate in 2015, by age group and gender (%) (2015)



Source: Compiled using TURKSTAT National Education Statistics Database.

Figure C.1.8 Master's graduation number, by age group and gender (2015)

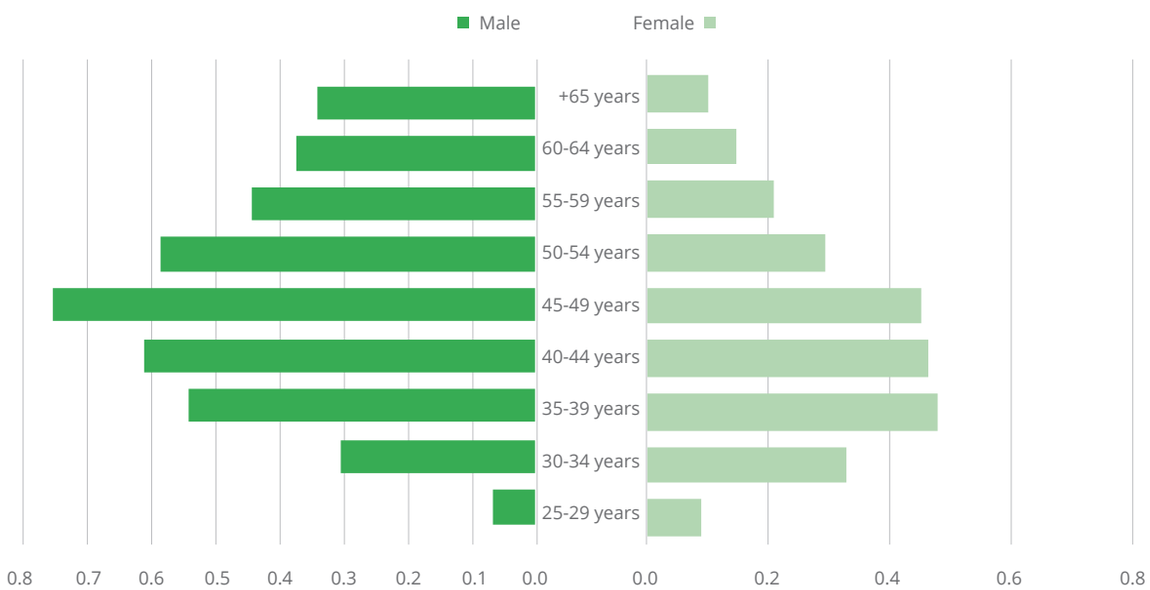


Source: Compiled using TURKSTAT National Education Statistics Database.

The number of master's programs graduates in 2015, according to age group and gender is shown in Figure C.1.8. In this respect, among the 25-29-year-olds, there are more female master's graduates (51,000) than males (45,000). There is a significant increase in the number of master's graduates among the 30-34-year-olds. With 75,000 master's graduates, males surpass females (71,000) in this age group. Moreover, in terms of the number of master's graduates, the gap between males and females widens as the age increases. Males have a lower rate and number of master's graduates at younger ages because males start and finish their university education later than females and they are inclined to postpone their compulsory military service. Furthermore, as females tend to be more successful than males, they tend to finish their studies in shorter periods of time. On the other hand, the 25-29 age group having a lower rate and number of master's graduates than the following two age groups can also be related to ongoing master's degree studies and students completing their master's degree at an older age.

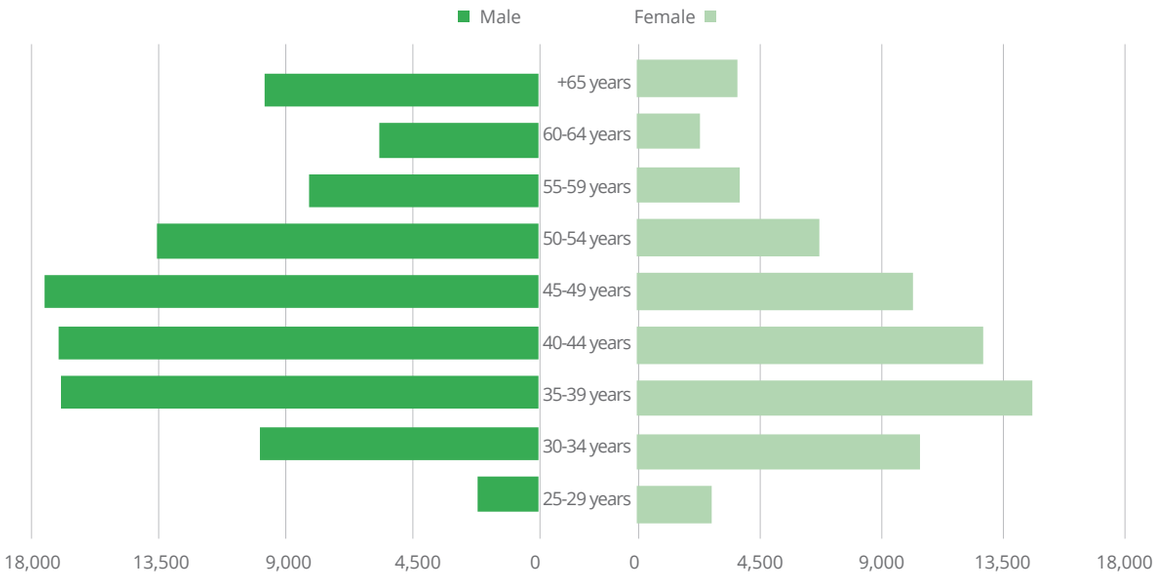
The rate of doctorate graduates in 2015 according to age group and gender is shown in Figure C.1.9. The data also includes Doctor of Science (DSc) and Doctor of Medicine (MD) graduates. According to this data, the rate of doctorate graduates among the 25-29 age group is 0.07% for males and 0.09% for females and this rate is lower than in the other age groups. Possible reasons are prolonged doctorate education and the fact that it is rare to complete a PhD program before the age of 30. On the other hand, regarding the 30-34 age group, the rate of doctorate graduates has increased to 0.3% among males and 0.33% among females. In both the age groups, females have higher rates than males. The most plausible cause for this is males completing their education later than females because of the compulsory military service.

Figure C.1.9 Doctoral graduation rates in 2015, by age group and gender (%) (2015)



Source: Compiled using TURKSTAT National Education Statistics Database.

Figure C.1.10 Doctoral graduation numbers, by age group and gender (2015)



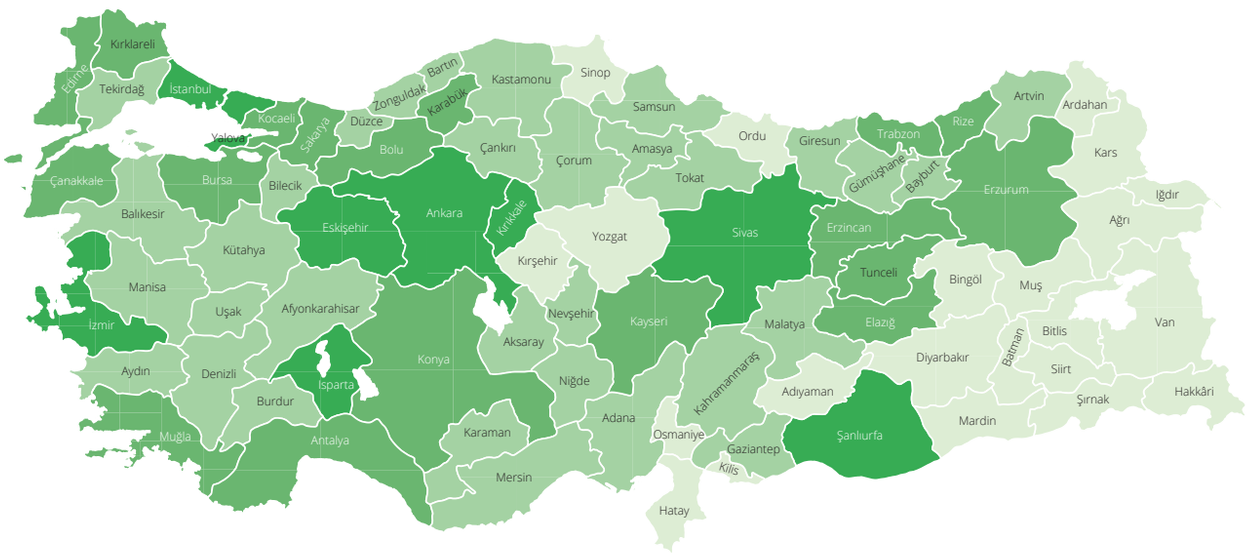
Source: Compiled using TURKSTAT National Education Statistics Database.

Number of doctorate graduates according to age group and gender is shown in Figure C.1.10. Among the 25-29-year-olds, the number of doctorate program graduates is around 2,200 for males and 2,700 for females. In the 30-34-year-old age group, there are 10,000 male and 10,500 female doctorate graduates. The number of male doctorate program graduates among 45-49-year-olds, 40-44-year-olds and 35-39-year-olds is higher than all the remaining age groups. With the recent expansion of higher education, the number of female doctorate graduates showed a significant increase among the 40-44-year-olds and 35-39-year-olds.

The number of master's graduates per 1,000 people by city is shown in Map C.1.11. Istanbul, İzmir, Ankara, Eskişehir, Kırıkkale, Isparta, Sivas, Yalova and Şanlıurfa have more than 8 master's graduates per 1,000 people. Employment prospects, the number and capacity of universities, being small cities with large universities, being a metropolis and being close to a metropolis are just some of the factors that positively affect the number of master's program graduates. The lowest rates of master's program graduates are seen in the cities of Eastern and South-eastern Anatolia. With the exception of Diyarbakır, Kars and Van, cities lacking universities prior to 2006, therefore lacking accessibility is one of the most important reasons for the low rate.

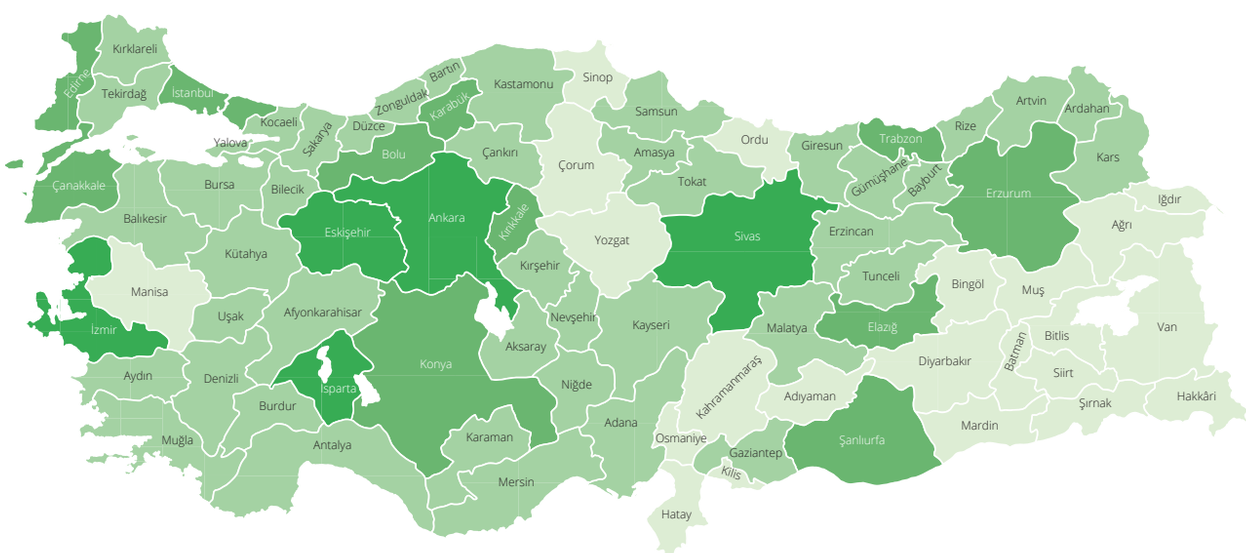
The doctoral graduation number per 1,000 people by city is shown in Map C.1.12. According to the map, İzmir, Isparta, Eskişehir, Ankara and Sivas have the highest rates of doctorate graduates. In the aforementioned cities, there are more than 3 doctorate graduates per 1,000 people. As it is stated, the number and capacity of universities, university size, presence of experienced civil servants and employment prospects for high-skilled labour are some of the factors which contribute to the high rate of doctorate graduates. Similar to master's graduates, the rate of doctorate graduates is lowest in cities of Eastern and South-eastern Anatolia. With the exception of 16 cities, 65 cities in Turkey have less than 2 doctorate graduates per 1,000 people. The rate further declines when only DSc is taken into consideration. In this respect, Turkey's number of doctorate graduates is fairly low when compared with other OECD countries (see Figure C.1.13).

Map C.1.11 Number of master's graduates per 1,000 people, by city (2015)



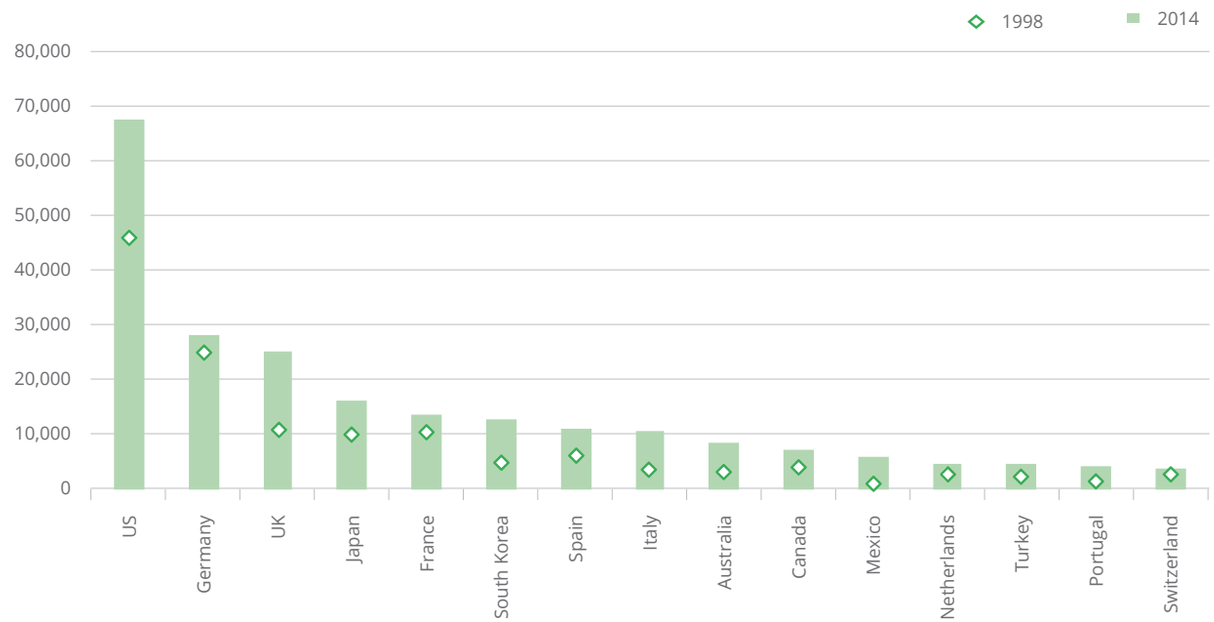
Source: Compiled by using TURKSTAT National Education Statistics Database.

Map C.1.12 Number of doctorate graduates per 1,000 people, by city (2015)



Source: Compiled using TURKSTAT National Education Statistics Database.

Figure C.1.13 Annual numbers of doctorate graduates in certain OECD countries (1998, 2014)



Source: Compiled using OECD data (2016b).

Annual doctorate program graduate figures in certain OECD countries for the years 1998 and 2014 are given in Figure C.1.13. According to this graph, Turkey has increased its annual number of doctorate graduates from 2,300 to 4,500. However, **Turkey's annual number of graduates remains lower than countries like the Netherlands, Canada, Australia, South Korea and France. According to 2014 data, the US, Germany, the UK and Japan had 67,000, 28,000, 25,000 and 16,000 doctorate graduates, respectively.**

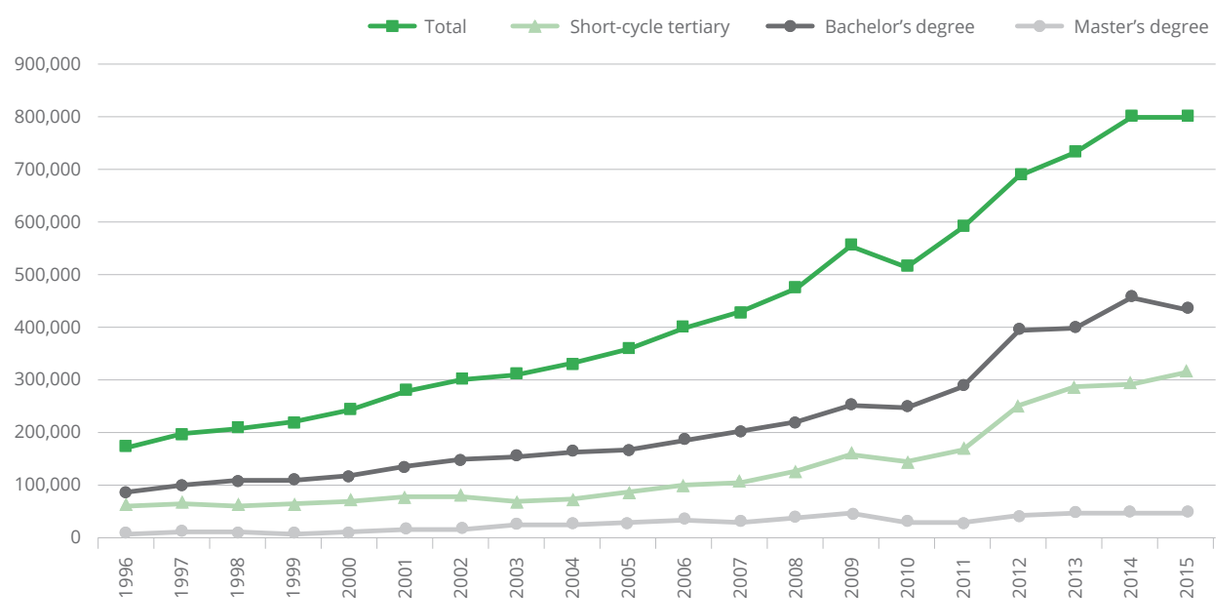
INDICATOR C2 HIGHER EDUCATION GRADUATION RATES

The rate of higher education graduation is a prominent indicator that demonstrates a country's development in terms of human capital; higher education graduates have the potential to produce products/services with higher added value. In this chapter, trends in Turkey's number of higher education graduates, the number of students who receive teaching certificate programs and the success of Academic Personnel and Graduate Education Entrance Exam (ALES) will be discussed.

Trends in the number of higher education graduates between the years 1996-2015 by level of education are shown in Figure C.2.1. There was a significant increase in higher education graduates between 1996-2015. While 175,000 graduated from higher education institutions in 1996, this number reached 360,000 in 2005. The annual number of higher education graduates continued to increase sharply between 2007-2009 and reached 557,000. There was a decrease in the number of graduates in 2010; however, the rise continued in the following years. In the 2015-2016 academic year, the number of higher education graduates reached 803,000. According to the data, in terms of the number of higher education graduates, an increase of more than 350% occured between 1996-2015. Especially from 2006-2007 onwards, there was a sharp increase in the number of higher education graduates because of policies aiming to expand higher education.

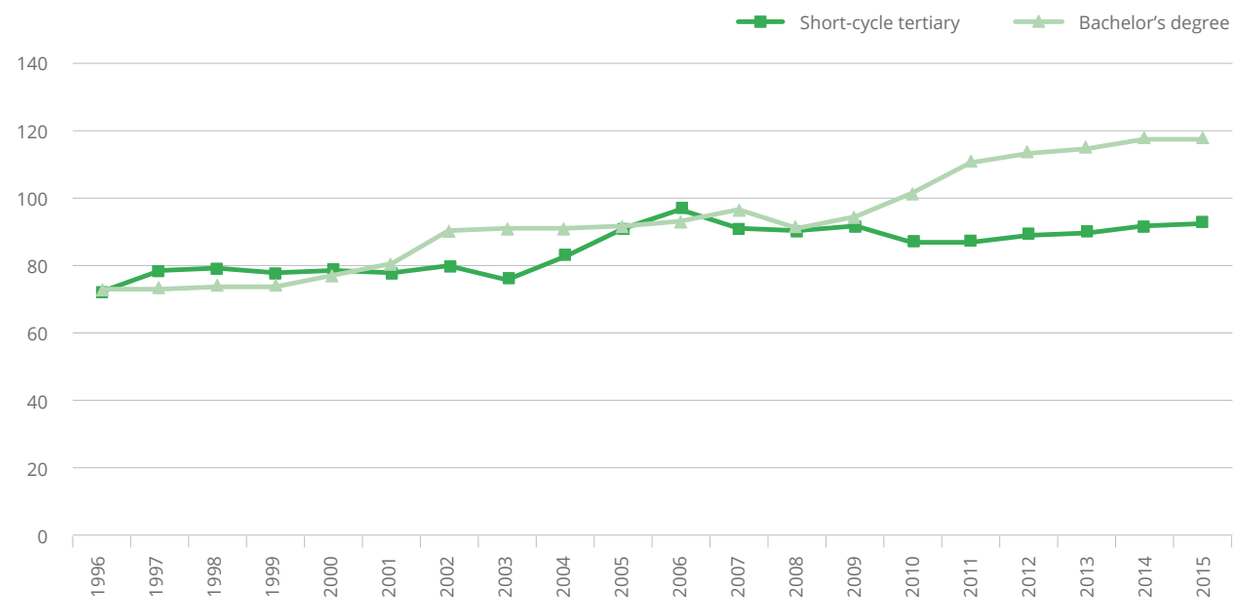
In terms of the number of annual short-cycle tertiary graduates, there was a steady increase from 63,000 in 1996 to around 100,000 in 2006 (Figure C.2.1). The growth rate increased in the following three years and the number of associate degree graduates increased to 161,000. From 2012 onwards, the number of short-cycle tertiary graduates skyrocketed and reached 316,000 in 2015. The number of short-cycle tertiary graduates increased by 480% between 1996-2015. Meanwhile, there was a significant increase in the annual number of bachelor's degree gradu-

Figure C.2.1 Trends in the higher education graduation numbers, by level of education (1996-2015)



Source: Compiled using Higher Education Information Management System and ÖSYM data.

Figure C.2.2 Trends in higher education graduation rates, by gender and level of education (1996-2015)



Source: Compiled using Higher Education Information Management System.

ates between 1996-2015 as well. It increased from 90,000 in 1996 to 187,000 in 2006. The annual number of bachelor's graduates reached 290,000 in 2011. With a 100,000 increase, the number rose to 390,000 in 2012. The growth in numbers continued in the following years and reached 437,000 in 2015. In general, the number of bachelor's degree graduates was quintupled between 1996-2015. The annual number of master's graduates increased from 9,000 to 49,000. While the increase between the years 1996-2000 was minimal (3,000), the growth between 2001-2006 increased to 35,000, showing a %200 increase. After two years of stagnation, the number of master's graduates reached 47,000 in 2009. There was a significant decline in the number of master's graduates in the years 2010 and 2011, dropping to 30,000 annually. From 2012 onwards, a swift recovery followed. The number of master's graduates reached 49,000 by 2015.

Trends in short-cycle tertiary and bachelor's degree graduates' gender ratios between 1996 and 2015 are shown in Figure C.2.2. According to the data, while 73 female students graduated with a bachelor's degree for every 100 male students in the 1996-1997 academic year, there was a shift in favor of female students in the 2010-2011 academic year and for every 100 male students 102 female students graduated. In the following years, the graduation rate continued to increase in favor of female students and 118 female students for every 100 male students graduated in the 2015-2016 academic year. Regarding the short-cycle tertiary graduation, there was a fluctuating trend in terms of gender between 1996-2015; however, the graduation rate for females almost caught up with the rate of male students. While 73 female students graduated for every 100 male students in the 1996-1997 academic year, in the 2015-2016 academic year 93 female students graduated for every 100 male students.

The number of candidates who apply to teaching certificate (pedagogical formation) programs also provides insight on higher education students and graduates. As it can be seen in Table C.2.3, the quota for teaching certificate programs in 2013 was 30,000 students. 66,000 students had applied for teaching certificate programs; however, only 29,000 of them were admitted. In the following year, the quota was increased to 40,000 (even though 46,000 students applied for the program, a quota of 10,000 was left

Table C.2.3 Quotas for teaching certificate programs (2013-2015)

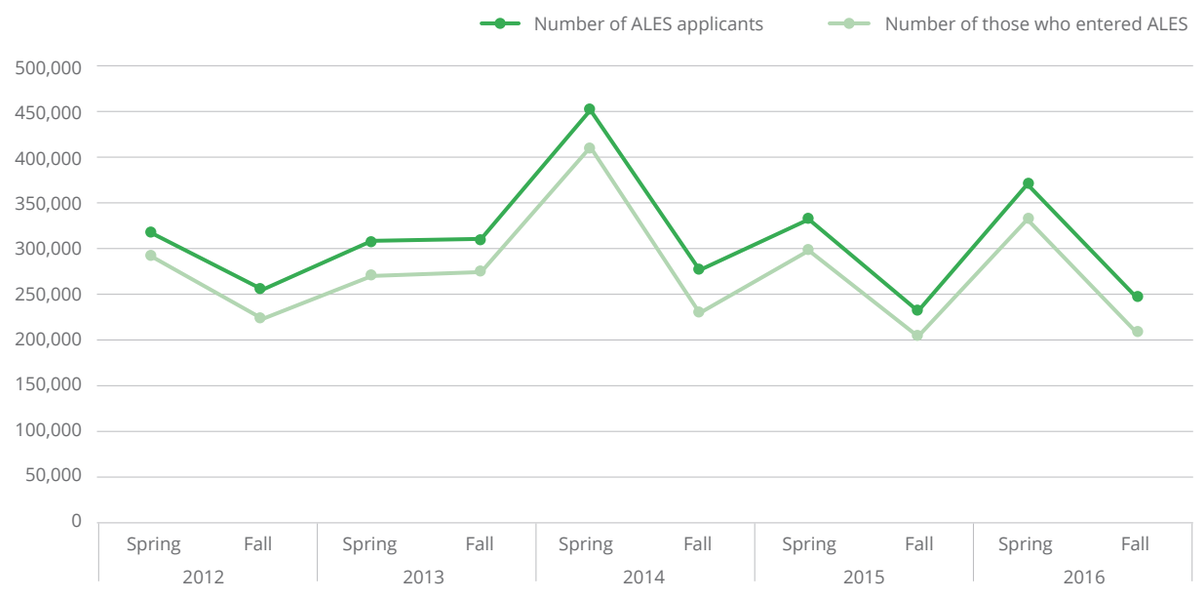
	Number of Applicants	Quota	Additional Quota
2013	65,735	30,000	
2014	45,893	40,000	
2014	-	62,045	4,450
2015	-	41,490	3,390
2016	-	Unlimited	-

Source: Compiled using ÖSYM and BHE data.

unfilled because of the inability to match the candidates and programs). From 2014 onward, the quota for teaching certificate programs was set to 100,000. Yet, after 2016, the quota was completely eliminated and universities were allowed to set their own quotas. Therefore, almost everyone who sought teaching certificate programs were allowed to apply and be admitted to the program. There is no decisive data about how many students have taken teaching certificate programs in the last two years.

ALES is used in applications for becoming an academic, language instructor, research assistant, expert, translator and education planner along with applications to post-graduate studies. Moreover, it is also used for applying to post-graduate programs abroad under Law No. 1416 on students who are to be sent abroad for education. Taking place twice every year (in spring and fall), ALES is valid for three years. It consists of 4 sections, each containing 40 questions: Quantitative-1, Quantitative-2, Verbal-1 and Verbal-2. Candidates are foreseen to answer at least three sections, thus 120 questions. According to the tests that are selected, a candidate's scores (verbal, quantitative, equally-weighed) is calculated out of 100 (ÖSYM, 2016).

Figure C.2.4 Trends in the number of applicants and those who entered ALES (2012-2016)



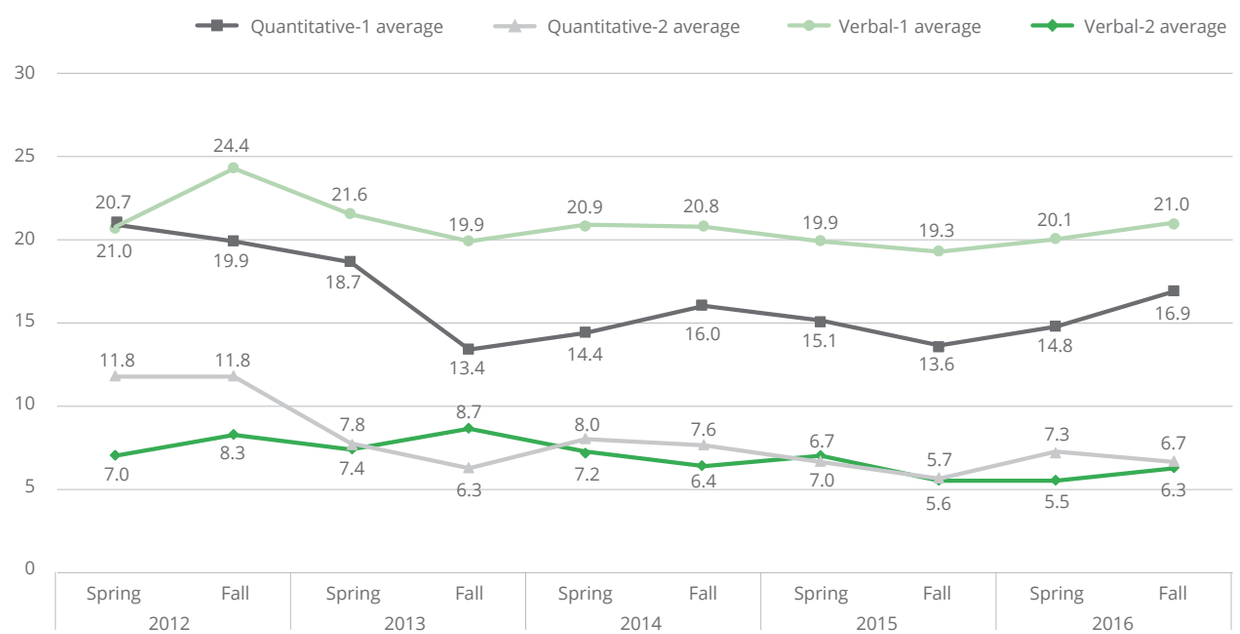
Source: Compiled using ÖSYM data.

Trends in the number of applicants and those who entered ALES between 2012-2016 are shown in Figure C.2.4. The number of applicants and those who entered the exam have a fluctuating pattern. While 316,000 applied to ALES and 292,000 of them entered the exam in Spring 2012, 255,000 applied to ALES and 224,000 attended the exam in Fall 2012. In general, the rate of applications and attendance to ALES in the spring is higher than in the fall. This is because of senior students preferring to enter the exam just before their education is completed. Applications in Spring 2014 skyrocketed; 453,000 applied to ALES, while 410,000 attended the exam. There is a decline in appli-

cation in the following years and terms. In Spring 2016, 370,000 applied for the exam while only 333,000 attended. The number of applications and attendance declined to 245,000 and 208,000, respectively, in Fall 2016. The primary reason behind the decline of applications is the removal of ALES as a criterion from non-thesis master's programs with a Board of Higher Education decision implemented in 2012. Moreover, the nullification of Faculty Member Training Program (ÖYP), the decrease in the number of positions for research assistants and ALES's validation being extended from two years to three years might be additional factors which affected ALES applications.

Trends in average scores of ALES tests between 2012-2016 are shown in Figure C.2.5. According to the data, the highest average score is achieved in Verbal-1 test. The average score in Verbal-1 test is around 19-21. However, in certain years, this number surpassed 21. The second highest average score is achieved in Quantitative-1 test. There are significant fluctuations in the average scores of Quantitative-1 test over the years. For instance, the average score of 21 in Spring 2012 declined to 13.4 in Fall 2013. In the following terms, the average score of Quantitative-1 stood between 14-17. The third highest average score is in the Quantitative-2 test. While the average score was around 12 in 2012, it declined to the level of 6-8. The lowest average score is achieved in Verbal-2 test. It changes between 5.5-8.7 over the years.

Figure C.2.5 Trends in average scores by ALES tests (2012-2016)



Source: Compiled using ÖSYM data.
Note: As there were 50 questions in each section in 2012 and 2013, the average score was recalculated over 40 questions.

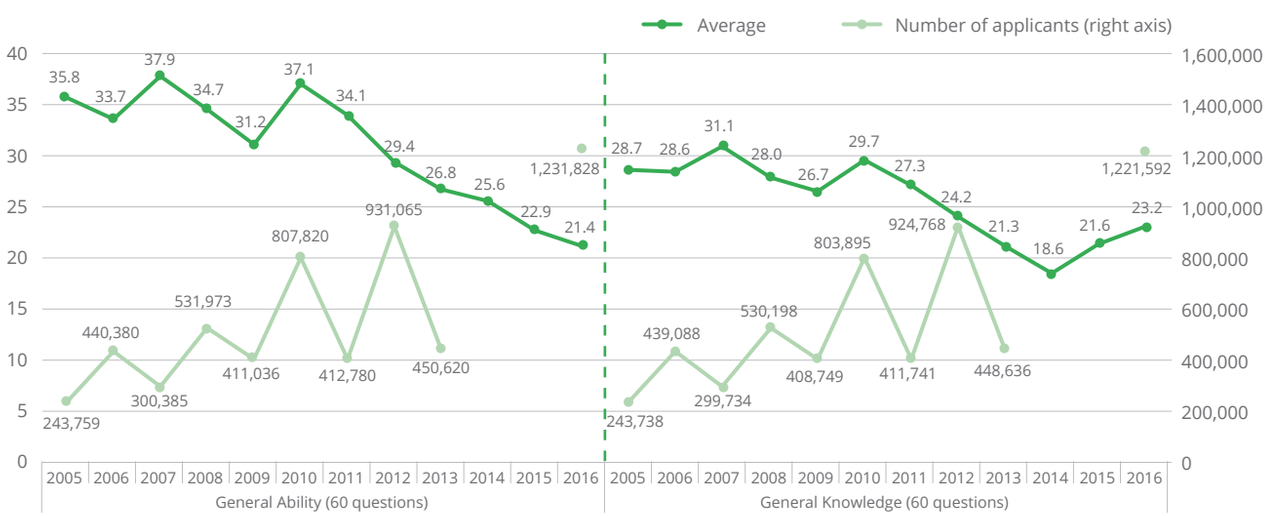
INDICATOR C3

PUBLIC EMPLOYMENT OF HIGHER EDUCATION GRADUATES

The public sector is important in the employment of higher education graduates in Turkey. There is high demand for public employment because of factors like job security, better working conditions and better pay than the private sector and also the likelihood of a more definite career path. For public employment, Public Personnel Selection Examination (KPSS) is being held. Performance in KPSS provides insight about higher education output. In this part, performances of bachelor's degree graduates in KPSS is assessed and the higher education output is evaluated through the analysis of KPSS data between the years 2005-2016.

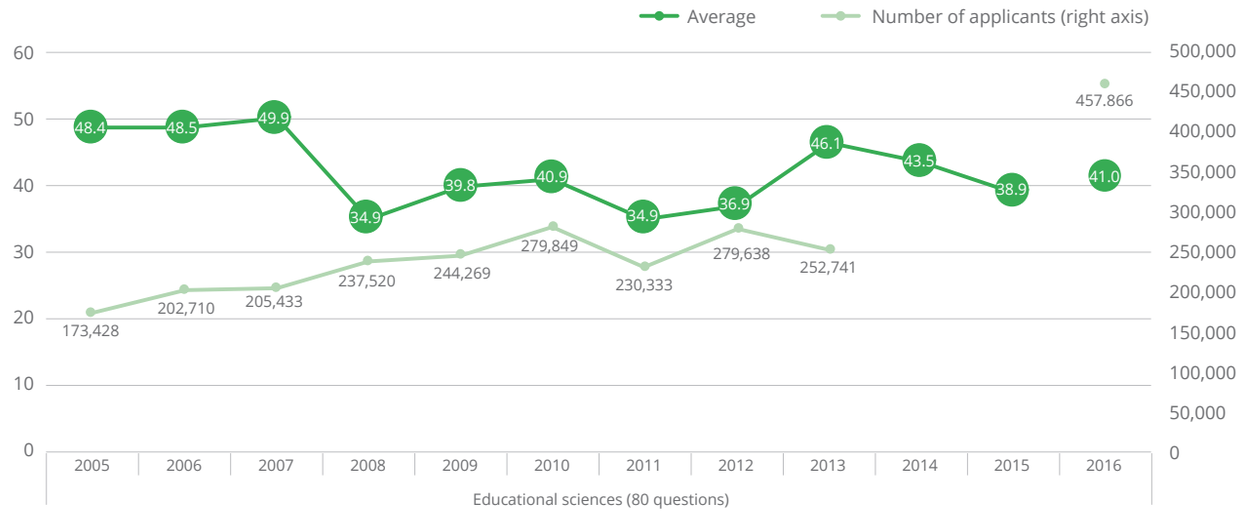
Trends in the number of applicants and their average scores in KPSS general knowledge and general ability tests between the years 2005-2016 are shown in Figure C.3.1. The number of applicants who entered KPSS general knowledge and ability tests have steadily increased over the years. While 244,000 entered general knowledge and ability tests in 2005, this number has increased to 440,000 in 2006. In 2016, the number of general knowledge and ability tests applicants surpassed 1.2 million. Moreover, there is a significant gap between odd and even years in terms of the number of applicants. This is due to the fact that those who want to be centrally appointed to KPSS-B positions enter the exam in even years, while those who want to be appointed to their KPSS-A career professions enter the exam every year. One of the most important factors in the increase of applications to KPSS is the increasing number of university graduates. It can be seen that the average score of the general ability test changes over the years. While the average was 36 in 2005, it has decreased to 21 in 2016. Similarly, on the general knowledge test, the average has decreased from 29 in 2005 to 23 in 2016.

Figure C.3.1 Trends in the number of applicants and their average scores in KPSS general knowledge and general ability tests (2005-2016)



Source: Compiled using ÖSYM data.
Note: As the number of KPSS applicants in 2014 and 2015 were not publicized by ÖSYM, it was not included in the graph.

Figure C.3.2 Trends in the number of applicants and average scores in KPSS educational sciences test (2005-2016)



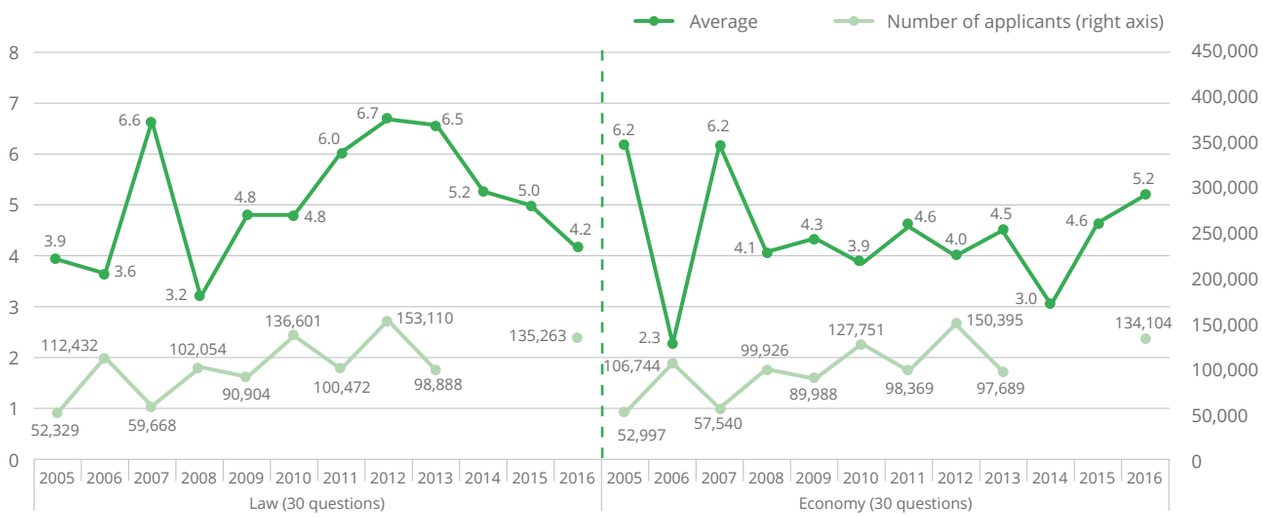
Source: Compiled using ÖSYM data.
Note 1: As the number of KPSS applicants in 2014 and 2015 were not publicized by ÖSYM, it was not included in the graph.
Note 2: The number of questions in KPSS educational sciences test has decreased to 80 from 120 since 2013 onwards. In order to make a comparison, the average scores of tests consisting of 120 questions were re-calculated over 80 questions.

Trends in the number of KPSS educational sciences applicants and average scores between 2005-2016 are shown in Figure C.3.2. According to the data, while 173,000 people applied to KPSS educational sciences test in 2005, this number has increased to 458,000 in 2016. Therefore, the number of applicants almost tripled. The primary factor behind this change is the increase in the number of teacher candidates who graduated from faculties of education in universities and the number of students in teaching certificate programs. Moreover, even though 50,000 teachers are appointed every year, those who were not appointed accumulate over time thereby contributing to the increasing number of applicants. Considering the number of students in faculties of education at universities and those who take teaching certificate programs, it is expected that the numbers of educational sciences applicants and "unassigned teachers" will increase in the following years. In evaluating the average scores of educational sciences tests over the years, extreme fluctuations can be observed. The average score is between 35-50.

Trends in the number of KPSS law and economy applicants and their average scores in KPSS law and economy tests between 2005-2016 are shown in Figure C.3.3. According to the graph, there is a partial increase in the number of applicants. While 52,000 took the law test in 2005, this number reached 112,000 in 2006. On the other hand, while 53,000 took the economy test in 2005, it increased to 107,000 by 2006. These numbers reached 135,000 for the law test and 134,000 for the economy test. Assessing the average scores of the law and economy tests, it can be seen that there is a significant fluctuation.

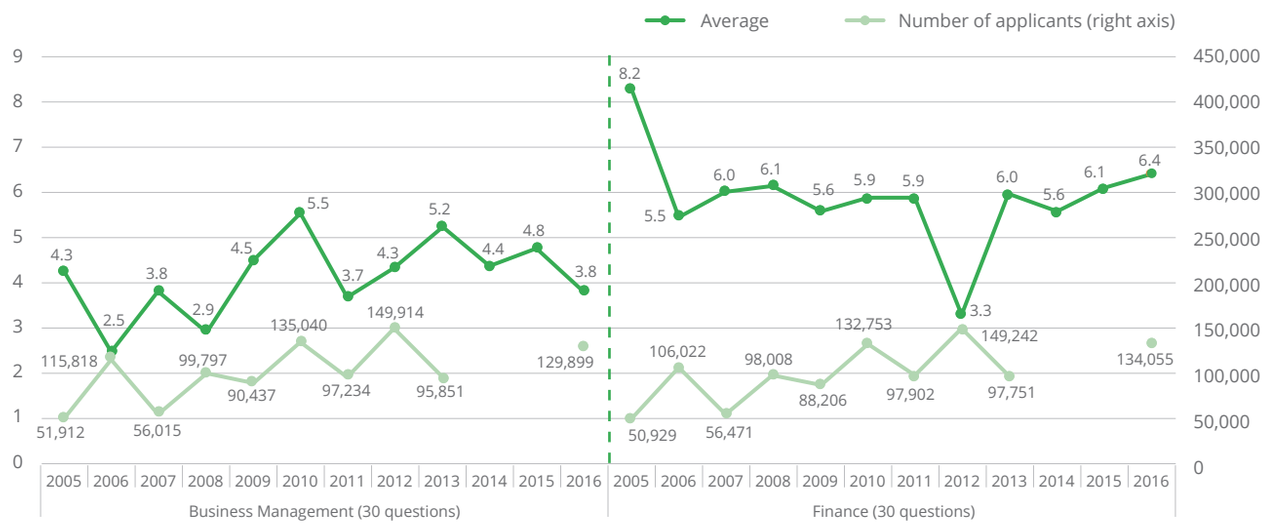
Trends in the number of KPSS business management and finance applicants and their average scores are displayed in Figure C.3.4. According to the graph, there is a partial increase in the number of KPSS business management and finance applicants. While 51,000 took the business management test in 2005, this number reached 116,000 in 2006. Similarly, while 51,000 took the finance test in 2005, this number reached 106,000 in 2006. These numbers increased to 130,000 for business management and 134,000 for finance tests. Looking at the trend of average scores of the business management and finance tests, a fluctuation can be observed.

Figure C.3.3 Trends in the number of KPSS law and economy applicants and their average scores (2005-2016)



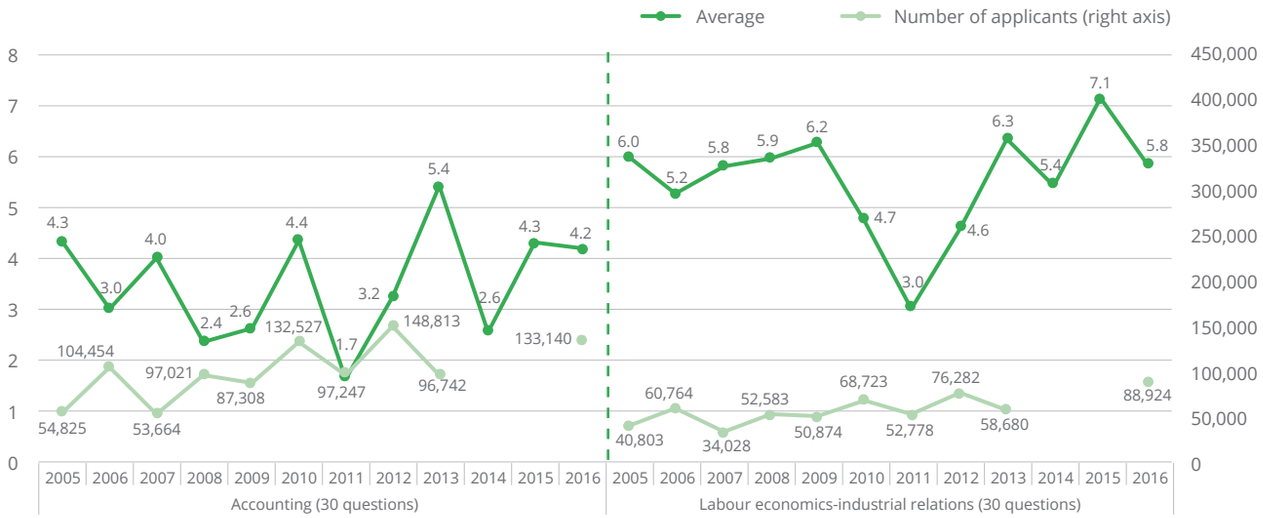
Source: Compiled using ÖSYM data.
Note: As the number of KPSS applicants in 2014 and 2015 were not publicized by ÖSYM, it was not included in the graph.

Figure C.3.4 Trends in the number of KPSS business management and finance applicants and their average scores (2005-2016)



Source: Compiled using ÖSYM data.
Note: As the number of KPSS applicants in 2014 and 2015 were not publicized by ÖSYM, it was not included in the graph.

Figure C.3.5 Trends in the number of KPSS accounting and labor economics-industrial relations applicants and their average scores (2005-2016)



Source: Compiled using ÖSYM data.
Note: As the number of KPSS applicants in 2014 and 2015 were not publicized by ÖSYM, it was not included in the graph.

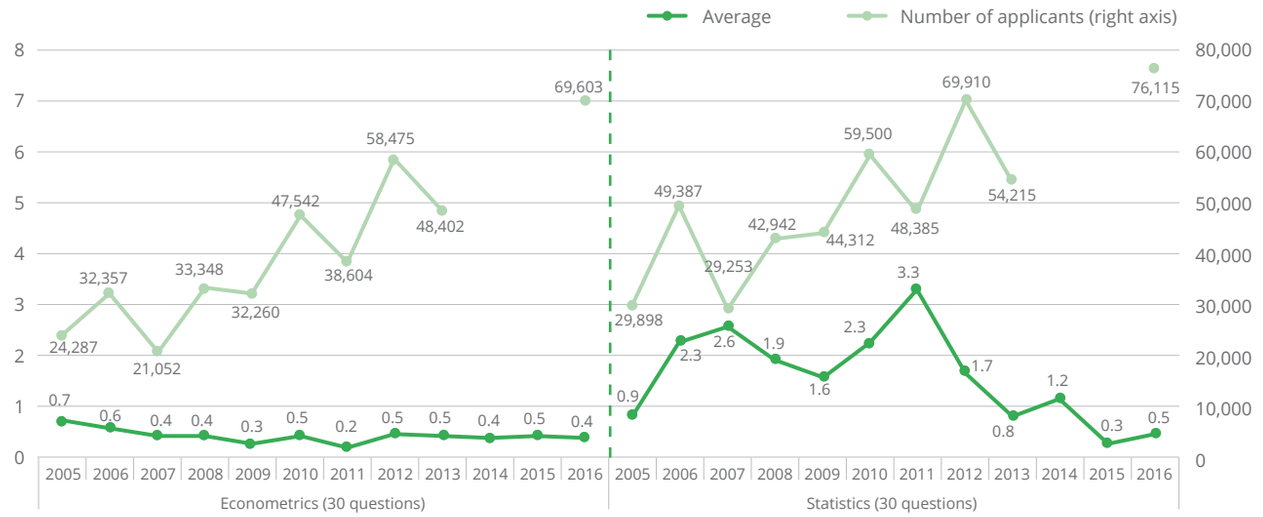
Trends in the number of KPSS accounting and labour economics-industrial relations applicants and average scores between 2005-2016 are shown in Figure C.3.5. According to the data, there is a partial increase in the number of applicants. While 55,000 took the accounting test in 2005, it increased to 104,000. In terms of labour economics and industrial relations, 41,000 took the tests in 2005 which increased to 61,000 in 2006. In 2016, the numbers increased to 134,000 for the accounting test and to 90,000 for labour economics and industrial relations. A fluctuation can be observed in the average scores of the accounting and labour economics and industrial relations test. While the average score for the accounting test was 2.4 out of 30 in 2008, it increased to 5.4 in 2013. In terms of the labour economics and industrial relations test, the average score was 4.6 out of 30 in 2012, it increased to 7.1 in 2015.

Trends in the number of KPSS econometrics and statistics applicants and average scores are demonstrated in Figure C.3.6. The data indicates that there is a partial increase in the number of applicants. In 2016, 70,000 took the econometrics test, while 76,000 attended the statistics test. The average scores of econometrics and statistics tests are rather low when compared to other fields. Especially in the econometrics test, the average score is lower than 1 in various years. The average score in econometrics between the 2005-2016 is 0.4-0.7. In terms of statistics, while the average score surpassed 2 in certain years, it has also declined to 0.3 in various years.

Trends in the number of KPSS public administration and international relations applicants and their average scores in the KPSS tests are shown in Figure C.3.7. According to the graph, there is partial increase in the number of applicants. While 43,000 took the public administration test in 2005, it increased to 59,000 in 2006. On the other hand, while 41,000 took the international relations test in 2005, this number increased to 56,000 in 2006. In 2016, 90,000 and 89,000 took the public administration and international relations tests, respectively. Assessing the average scores of both tests, a fluctuation can be observed. Regarding the public administration test, while the average score was 4.1 out of 30 in 2009, it increased to 9.7 in 2010. In terms of international relations, the average score was 2.4 out of 30 in 2009 which increased to 4.7 in 2013.

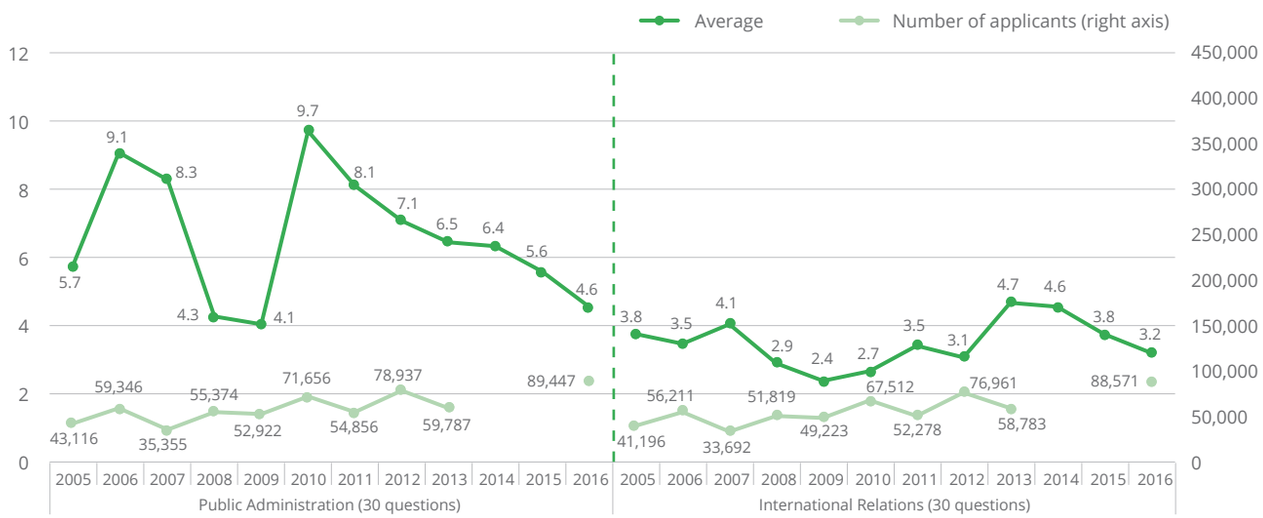
As it is expressed above, there has been a significant increase in the number of KPSS applicants who aim to work in the public sector in recent years. However, the most important growth was in educational sciences. The number

Figure C.3.6 Trends in the number of KPSS econometrics and statistics applicants and their average scores (2005-2016)



Source: Compiled using ÖSYM data.
Note: As the number of KPSS applicants in 2014 and 2015 was not publicized by ÖSYM, it was not included in the graph.

Figure C.3.7 Trends in the number of KPSS public administration and international relations applicants and their average scores (2005-2016)



Source: Compiled using ÖSYM data.
Note: As the number of KPSS applicants in 2014 and 2015 were not publicized by ÖSYM, it was not included in the graph.

of candidates taking the educational sciences test has almost doubled between 2005 and 2016 (Figure C.3.2). The remaining fields of KPSS have seen a moderate increase in numbers. The primary reason is the increase in the number of faculty of education graduates and those enrolled in teaching certificate programs along with the limited employment prospects for teachers in the private sector. In other fields, employment in the private sector is relatively less competitive. Another aspect is that the average scores of many tests are lower than 5 out of 25 (see Figure C.3.6). Furthermore, average scores of all fields show a change over time. In even years, the number of applicants increase

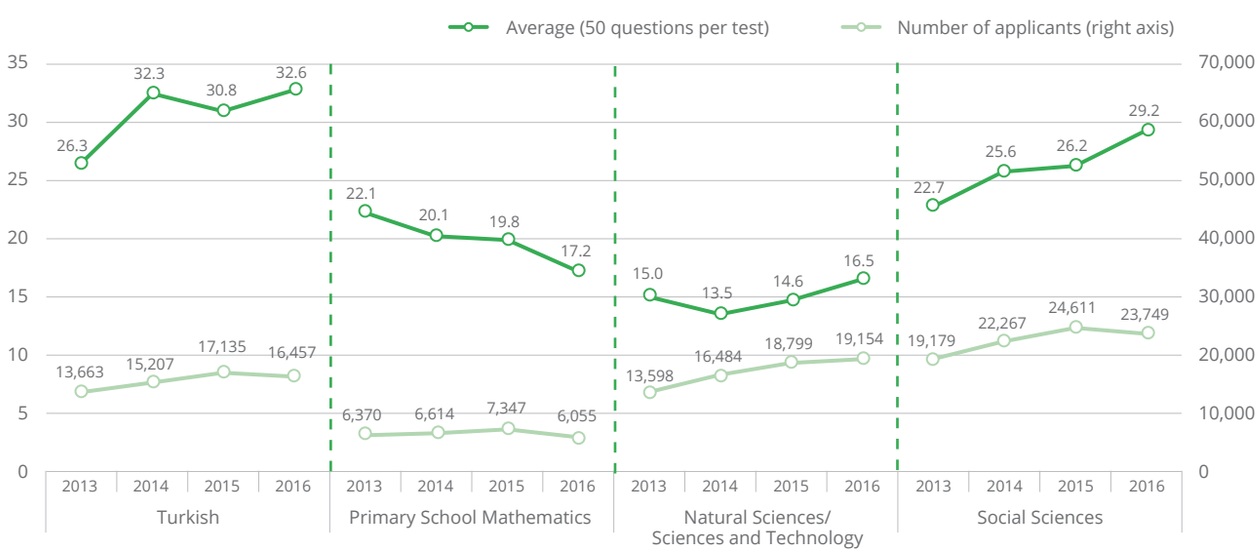
and average scores decline. As previously stated, the reason for the increase in the number of applicants in even years is due to KPSS-B. **Low average scores and their change over the years is a subject that should be thoroughly researched.** Another aspect is that the public sector focuses more on academic proficiency during the employment process. When evaluated together with higher education graduates the high demand in the public sector and studying for the tests, achieving the desired level of relations between the labour market and the higher education output is a challenge.

Until 2012, the scores of teacher candidates were calculated by taking the average of their general ability, general knowledge and educational sciences tests. However, with a decision taken by the Ministry of National Education (MONE) in 2012, teacher candidates were obliged to take the Teaching Field Knowledge Test (ÖABT) which includes respective fields of Turkish, Primary School Mathematics, Natural Sciences/Sciences and Technology, Social Sciences, Turkish Language and Literature, History, Geography, High School Mathematics, Physics, Chemistry, Biology, Culture of Religion and Knowledge of Morality and Foreign Language (German, French and English) in addition to the aforementioned tests. The first ÖABT including the 15 previously mentioned fields was held in 2013. While French was removed from ÖABT in the years that followed, preschool, counselling and primary school teacher candidates will have to take ÖABT. In 2016, ÖABT included 17 fields. ÖABT is not held in fields with relatively low teacher candidates. In such cases, the KPSS scores of the teacher candidates are calculated according to the sum of their general ability and general knowledge tests results.

ÖABT constitutes half of the teacher candidate's KPSS score. ÖABT consists of 50 questions per field. For this reason, ÖABT is crucial for teacher candidates. Furthermore, the subjects included in the ÖABT are determined for every field. In this respect, ÖABT provides insight about higher education graduates as it assesses teacher candidates' knowledge in their own fields.

Trends in the number of candidates who entered Turkish, primary school mathematics, natural sciences/scienc-

Figure C.3.8 Trends in the number of candidates who took Turkish, primary school mathematics, natural sciences/sciences and technology and social science tests and their average scores (2013-2016)

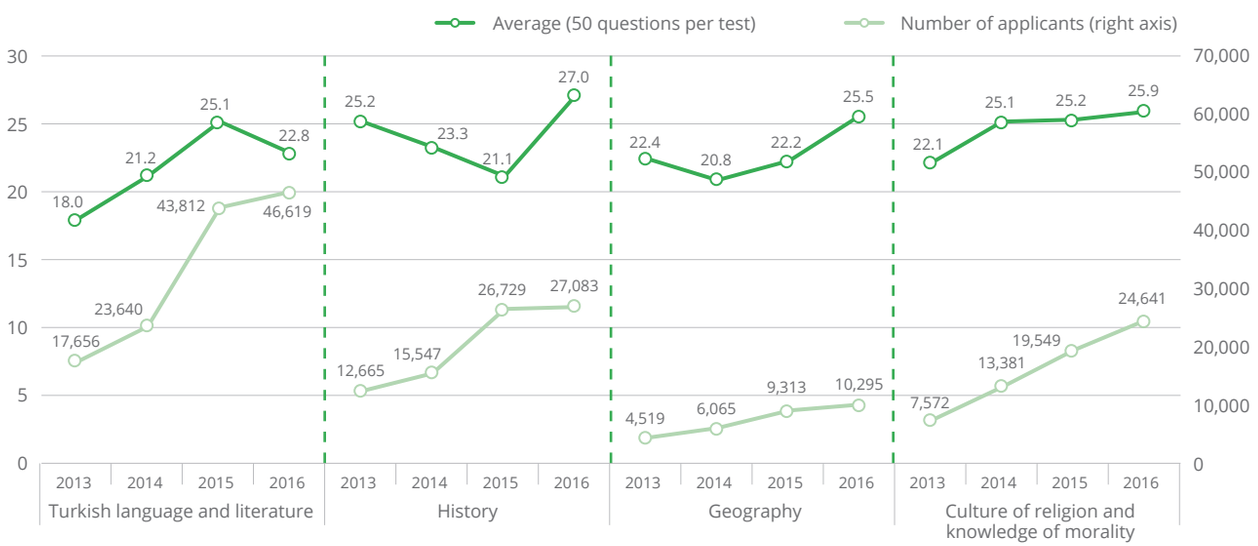


Source: Compiled using ÖSYM data.

es and technology and social science tests and average scores between 2013-2016 are shown in Figure C.3.8. According to the graph, between the years 2013 and 2016, the number of candidates who entered Turkish (13,600 to 16,500), natural sciences/sciences and technology (13,600 to 19,200), social sciences tests (19,200 to 23,700) increased. Primary school mathematics, on the other hand, experienced a decline in the number of applicants, decreasing from 6,400 to 6,100. Except the natural sciences/sciences and technology test, all other fields experienced a decline in the number of applicants in 2016. Evaluating the average scores in these fields, it can be seen that there is a fluctuation over time. The average scores shift between 26-33 in Turkish, 17-22 in primary school mathematics, 14-17 in natural sciences/sciences and technology and 23-29 in social sciences.

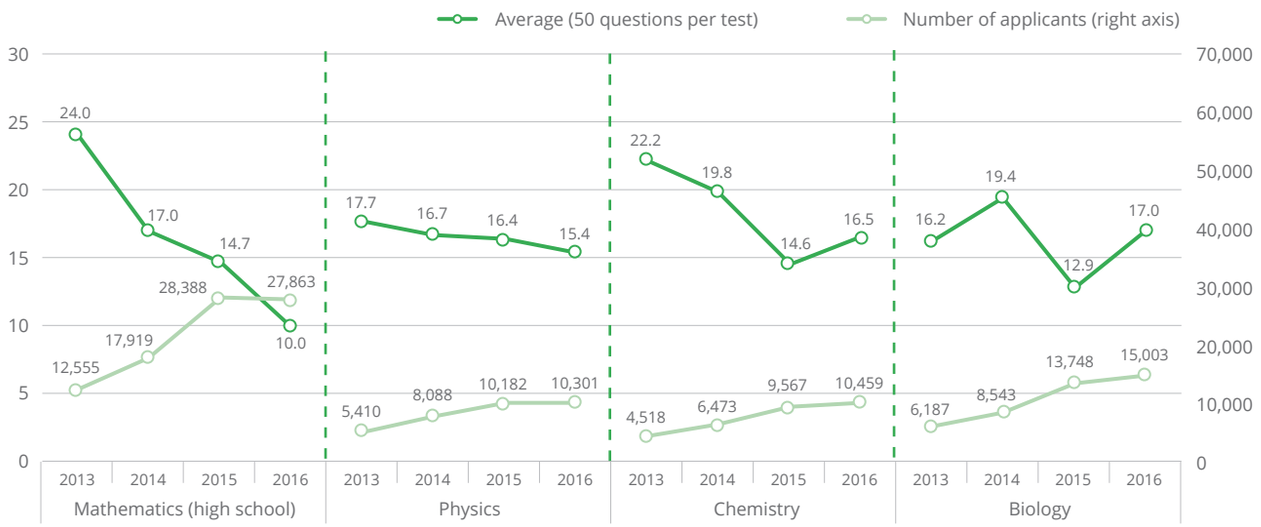
Trends in the number of candidates who entered Turkish language and literature, history, geography and culture of religion and moral knowledge tests and the average scores between 2013-2016 are shown in Figure C.3.9. According to the data, between 2013 and 2016, the number of candidates who entered Turkish language and literature (17,700 to 46,600), history (12,700 to 27,100), geography (4,500 to 10,300) and culture of religion and knowledge of morality tests (7,600 to 24,600) increased. In comparison with the four fields previously analysed, they have more applicants and a more significant increase in their numbers. Furthermore, the average scores of these fields change significantly over time. The average scores shift between 18-25 in Turkish language and literature, 21-27 in history, 21-26 in geography and 22-26 in culture of religion and knowledge of morality tests.

Figure C.3.9 Trends in the number of candidates who entered Turkish language and literature, history, geography and culture of religion and knowledge of morality tests and their average scores (2013-2016)



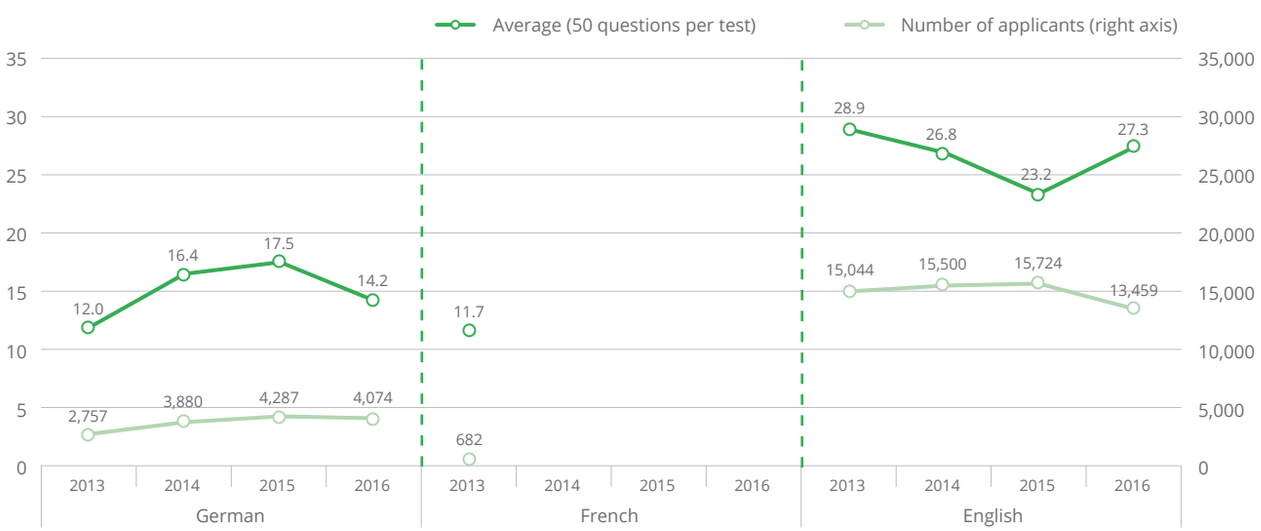
Source: Compiled using ÖSYM data.

Figure C.3.10 Trends in the number of candidates who entered mathematics, physics, chemistry and biology tests and their average scores (2013-2016)



Source: Compiled using ÖSYM data.

Figure C.3.11 Trends in the number of candidates who entered foreign language tests and their average scores (2013-2016)

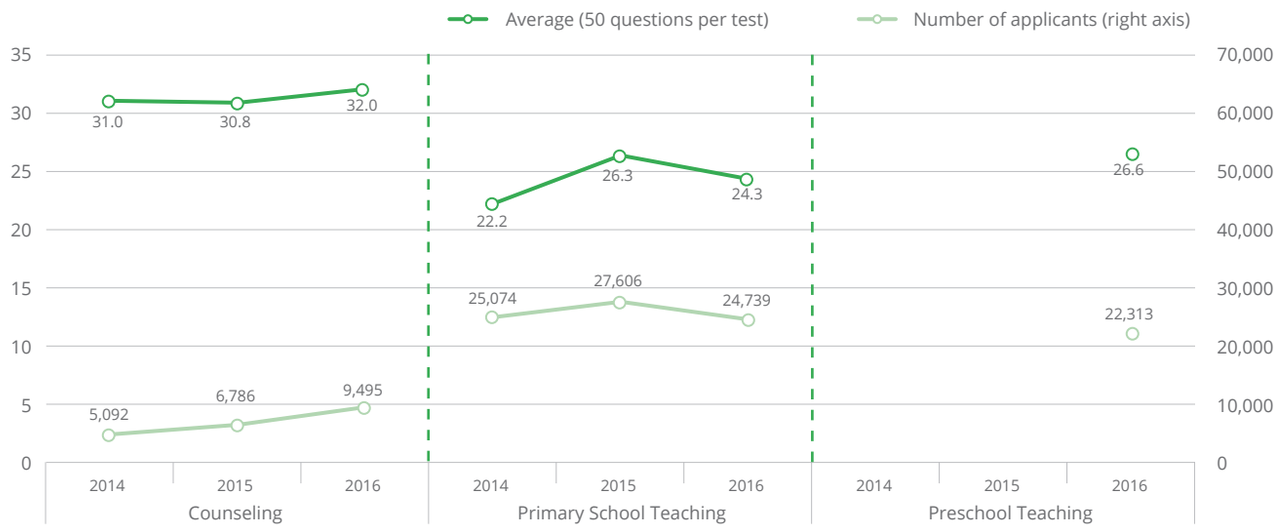


Source: Compiled using ÖSYM data.

Trends in the number of candidates who entered mathematics, physics, chemistry and biology tests and their average scores between the years 2013-2016 are demonstrated in Figure C.3.10. According to the data, the number of applicants to all fields increased during the given period. On the other hand, the average scores change significantly over time. The average scores shift between 10-24 in mathematics, 15-18 in physics, 15-22 in chemistry and 13-19 in biology.

Trends in the number of candidates who entered foreign language tests and their average scores between 2013-

Figure C.3.12 Trends in the number of candidates who entered preschool teaching, counselling and primary school teaching tests and their average scores (2013-2016)



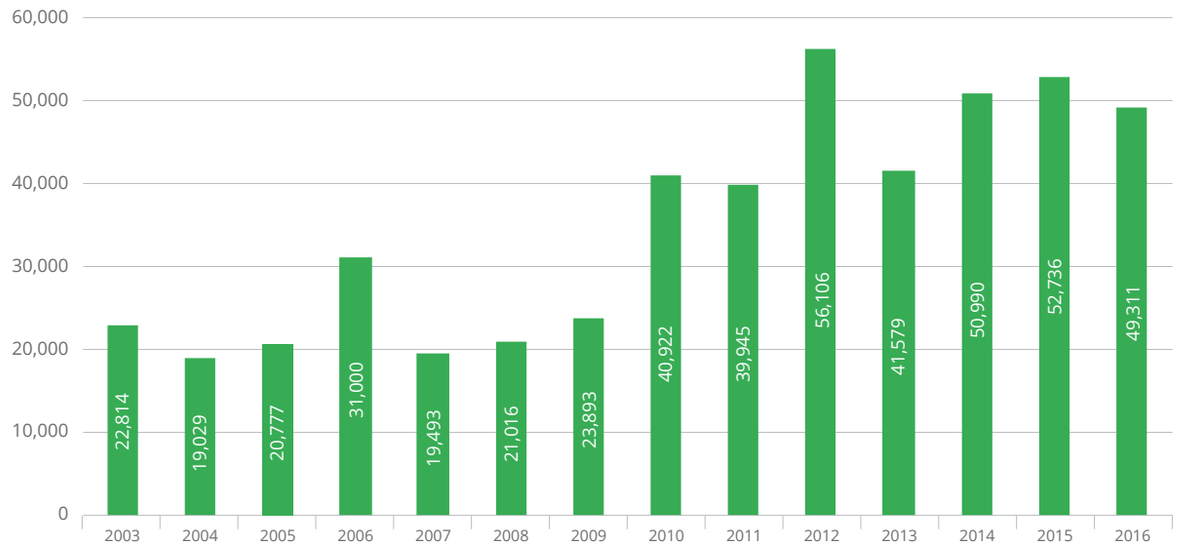
Source: Compiled using ÖSYM data.

2016 are displayed in Figure C.3.11. While the French test was only held in 2013, German and English tests were held every year between 2013-2016. 700 entered the French test in 2013. The number of applicants to German tests increased from 2,800 in 2013 to 4,100 in 2016. Meanwhile, the English test experienced a decline in the number of applicants; while 15,000 entered the exam in 2013, it decreased to 13,500 in 2016. The average scores of foreign language tests change significantly over time and have fairly low average. For instance, the average score of French is 12. Meanwhile, the average score of the German test shifts between 12-18 and for English between 23-29.

Trends in the number of candidates who entered preschool teaching, counselling and primary school teaching tests are shown in Figure C.3.12. The first ÖABT test for counselling was held in 2014. 5,100 and 9,500 entered the counselling test in 2014 and 2016, respectively. Similarly, the first ÖABT test for primary school teaching was held in 2014. While 25,100 entered the test in 2014, this number decreased to 24,750 in 2016. Regarding the ÖABT test for preschool teaching, it was first implemented in 2016 and 22,300 entered the test. The average scores for preschool teaching, counselling and primary school teaching tests fluctuate over time. The average score is 27 for the preschool teaching test; meanwhile, the average scores of primary schools teaching and counselling tests fluctuate between 22-24 and 31-32, respectively.

Trends in the number of teachers appointed by the Ministry of National Education between the years 2003-2016 are displayed in Figure C.3.13. 71,000 teachers who were previously appointed on contract and transferred to permanent staff in June 2011 were not included in the data. Adding the said 71,000 teachers, a total of 561,431 teachers have been appointed between 2003-2016. **According to the 2016 data, more than half of the current 994,000 teachers have been appointed in the last 14 years. Even though there are differences in the number of appointments each year, from 2010 onwards, the number remains over 40,000.** 56,000 teachers were appointed in 2012; meanwhile between the years 2013-2016, the average of appointments was around 50,000. Teachers have the highest number of public employment positions. With these high-scale appointments, it is expected that the need for the employment of teachers will decrease. According to the calculations, 100,000 teachers are needed (Eğitim-Bir-Sen, 2016).

Figure C.3.13 Trends in the number of teachers appointed by MONE (2003-2016)



Source: Compiled using February 2017 data that was provided by MONE.

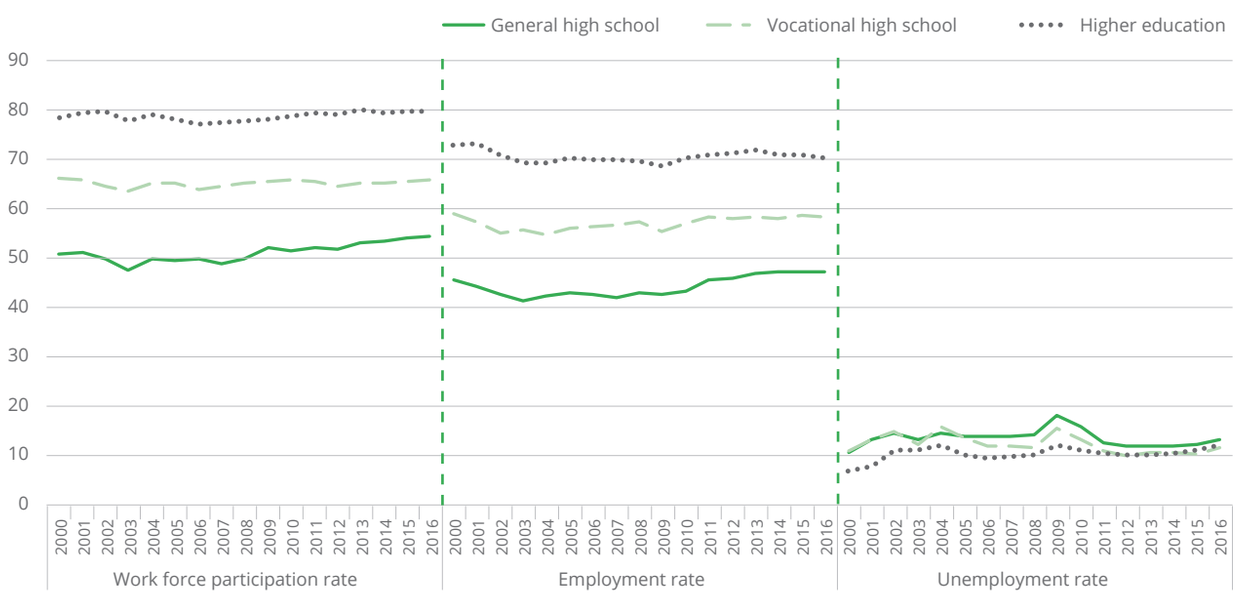
INDICATOR C4 EDUCATION'S ROLE IN THE LABOUR MARKET

It is assumed that individuals improve their skills through education and participate in the labor market more efficiently. There is a positive relation between level of education and the participation in the workforce. In this respect, it is foreseen that those who have higher levels of education have better prospects and therefore are more likely to participate in the labour market. In this indicator, various data demonstrating the relation between education and the labour market will be analysed.

Before the analysis of data, it would be appropriate to reiterate certain concepts and terms. **Workforce** consists of employed and unemployed persons who are **eligible for employment** in terms of age. The age range is considered **15-64. The workforce participation rate** is calculated in the following way: 100 x (unemployed + employed population) / total population eligible for employment. **Employment rate** is 100 x (employed population) / total population eligible for employment. **Unemployment rate,** on the other hand, is 100 x (unemployed population) / total population eligible for employment.

Trends in work force participation, employment and unemployment rates according to level of education between the years 2000-2016 are shown in Figure C.4.1. According to the data, there was no significant change in terms of work force participation rates of higher education graduates during the given period. Work force participation increased from 78.2% in 2000 to 79.7% in 2016. Regarding vocational high school graduates, the work force participation rate declined from 66.2% to 65.9%. In the same period, the work force participation rate of general high school graduates increased to 54.4% from 50.9%. However, there was a decline in the work force participation rates of higher education, vocational high school and general high school graduates between the years 2002-2004. The primary reason is the two large-scale economic crises that occurred at the end of 2001 and the beginning of 2002. It can be

Figure C.4.1 Trends in work force participation, employment and unemployment rates by level of education (%) (2000-2016)



Source: Compiled using TURKSTAT workforce statistics.

argued that especially higher education graduates and skilled workers that were employed in the banking and finance sector were affected negatively by these crises. Furthermore, **there is a positive relation between level of education and workforce participation.** Higher education graduates have a higher workforce participation rate than vocational and general high school graduates. While almost half of high school graduates are able to participate in the workforce, 80% of higher education graduates are employed in the workforce. On the other hand, vocational high school graduates have a higher workforce participation rate than normal high school graduates. In 2016, vocational high school graduates had a 12% higher work force participation rate than general high school graduates.

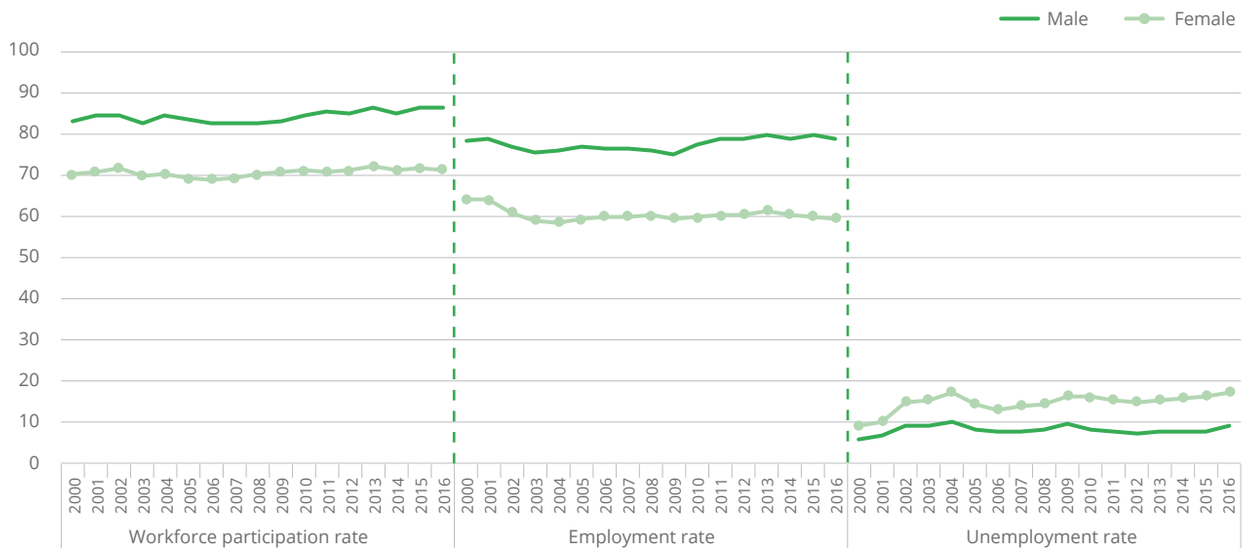
Looking at the employment rate of higher education graduates, it can be seen that the rate of 72.7% in 2000 declined to 70.1% in 2016 (Figure C.4.1). The probable reason in the decline of higher education graduates' work force participation rate is the swift increase of the number of higher education graduates and the structural dynamics of the labour market. Therefore, it is a matter of supply and demand; while the higher education expansion creates a surplus in terms of skilled workers, the labour market fails to create an adequate number of skilled jobs to accommodate the increasing number of skilled workers. Trends of higher education graduates' employment indicate that there is a decrease, albeit minimal, in the prospects of finding a job in comparison to the past. When assessing the employment rate of vocational high school graduates, it can be seen that there is no significant change between the years 2000 and 2016. The employment rate of vocational high school graduates decreased to 58.2% in 2016 from 58.9% in 2016. After the 2001 and 2002 crises, the employment rate of vocational high schools decreased down to 55%; however, it has increased steadily in the following years. General high school graduates, on the other hand, had an employment rate of 47.2% in 2016 in comparison to 45.6% in 2000. Similarly, general high school graduates also experienced a decreased employment rate following the 2001 and 2002 crises; however, an upward trend was then observed after the said crises. While more than two thirds of higher education graduates are employed, this rate is more than half for vocational high schools and less than half for general high schools. This indicates that occupational skills, improved through education lead to better employment prospects.

Analysing the unemployment rates by level of education, it can be seen that the unemployment rates between the years 2000-2016 increased from 7% to 12% for higher education graduates, from 10.5% to 13.4% for general high school graduates and from 10.9% to 11.6% for vocational high school graduates (Figure C.4.1). Even though vocational high school graduates are expected to have less risk in terms of unemployment because of their vocational training, their unemployment rate is analogous to those of general high schools. This raises questions about the benefits of vocational training in the labour market. On the other hand, the unemployment rate of higher education graduates is higher than vocational high school graduates, albeit slightly.

Trends in workforce statistics of higher education graduates over the age 15 according to gender are shown in Figure C.4.2. According to the data, the work force participation rate of female higher education graduates increased to 71.3% in 2016 from 70.1% in 2000. It can be observed that male higher education graduates have a higher work force participation rate than female graduates. While male workforce participation rate was 83.2% in 2000, it has increased to 86.4% in 2016. The difference between female and male work force participation rates might be explained through socio-cultural dynamics that determine female workforce participation. In this respect, it can be said that female higher education graduates are less enthusiastic about work force participation after marriage and especially after having children.

Similar to the trends in work force participation, it can be seen that male higher education graduates also have a higher employment rate than female graduates (Figure C.4.2) There was no significant change in male employment rates over the specified period. The male employment rate, that was 78.1% in 2000, slightly increased to 78.8% in 2016. Meanwhile, the female employment rate has decreased from 63.8% in 2000 to 59.3% in 2016.

Figure C.4.2 Trends in workforce statistics of higher education graduates over the age 15 according to their gender (%) (2000-2016)

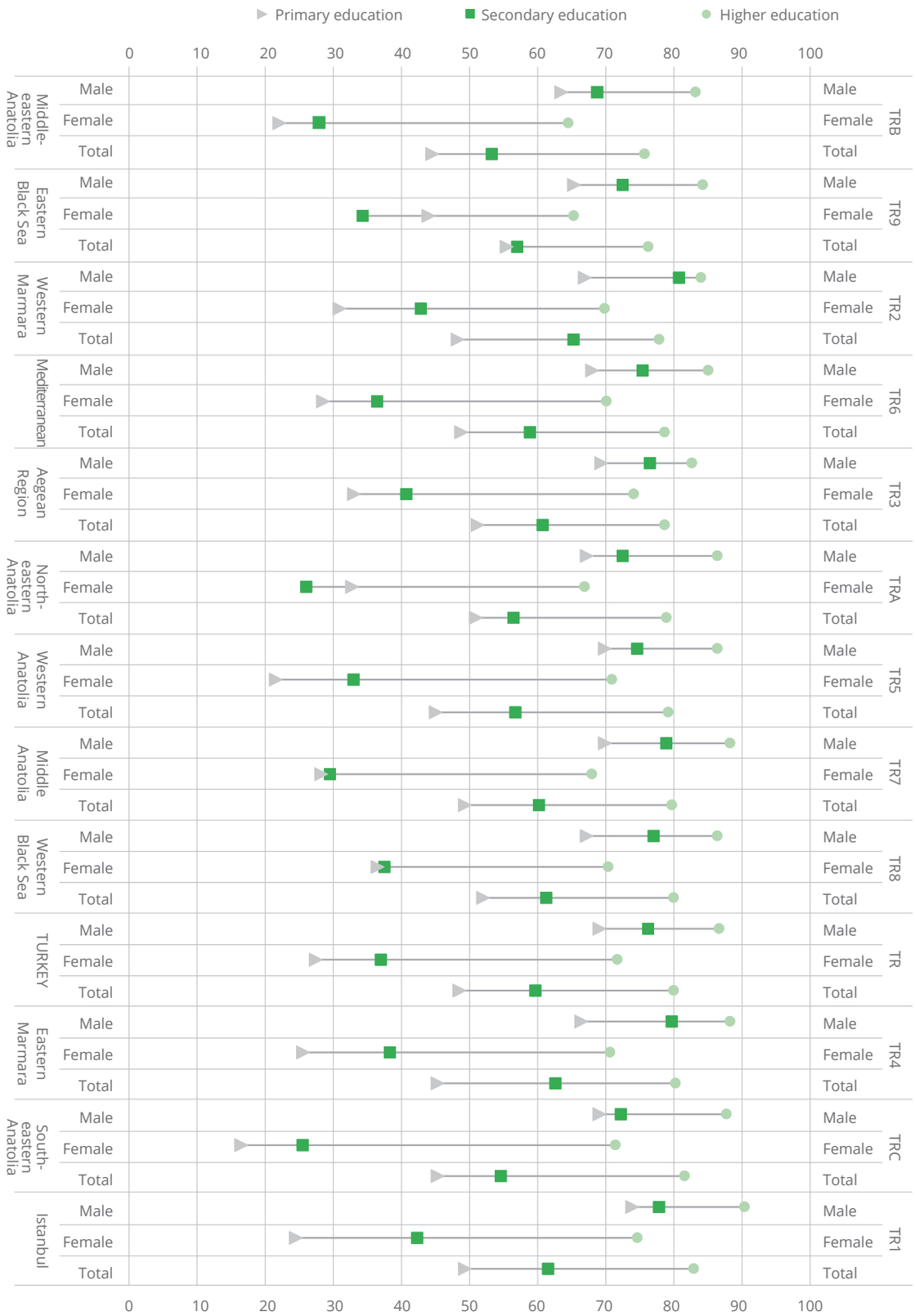


Source: Compiled using TURKSTAT workforce statistics.

Looking at unemployment rates, it can be seen that the female unemployment rate is higher than males (Figure C.4.2). Higher education graduate unemployment rates among males have increased from 5.9% in 2000 to 8.8% in 2016. Meanwhile, this rate among females almost doubled within the same period of time, increasing from 9.1% to 16.9%. This situation also highlights the increased female participation in the workforce. The average of OECD countries indicates a 10% difference between higher education graduate male and female employment rates in favour of males. **In Turkey, however, this difference is around 20% in favour of males.** There are many reasons for this situation, ranging from societal gender roles to discrimination of employers. Meanwhile, countries like France, Finland, Austria, Belgium and Sweden have similar higher education graduate female employment rates that are almost on par with male employment rates (OECD, 2016).

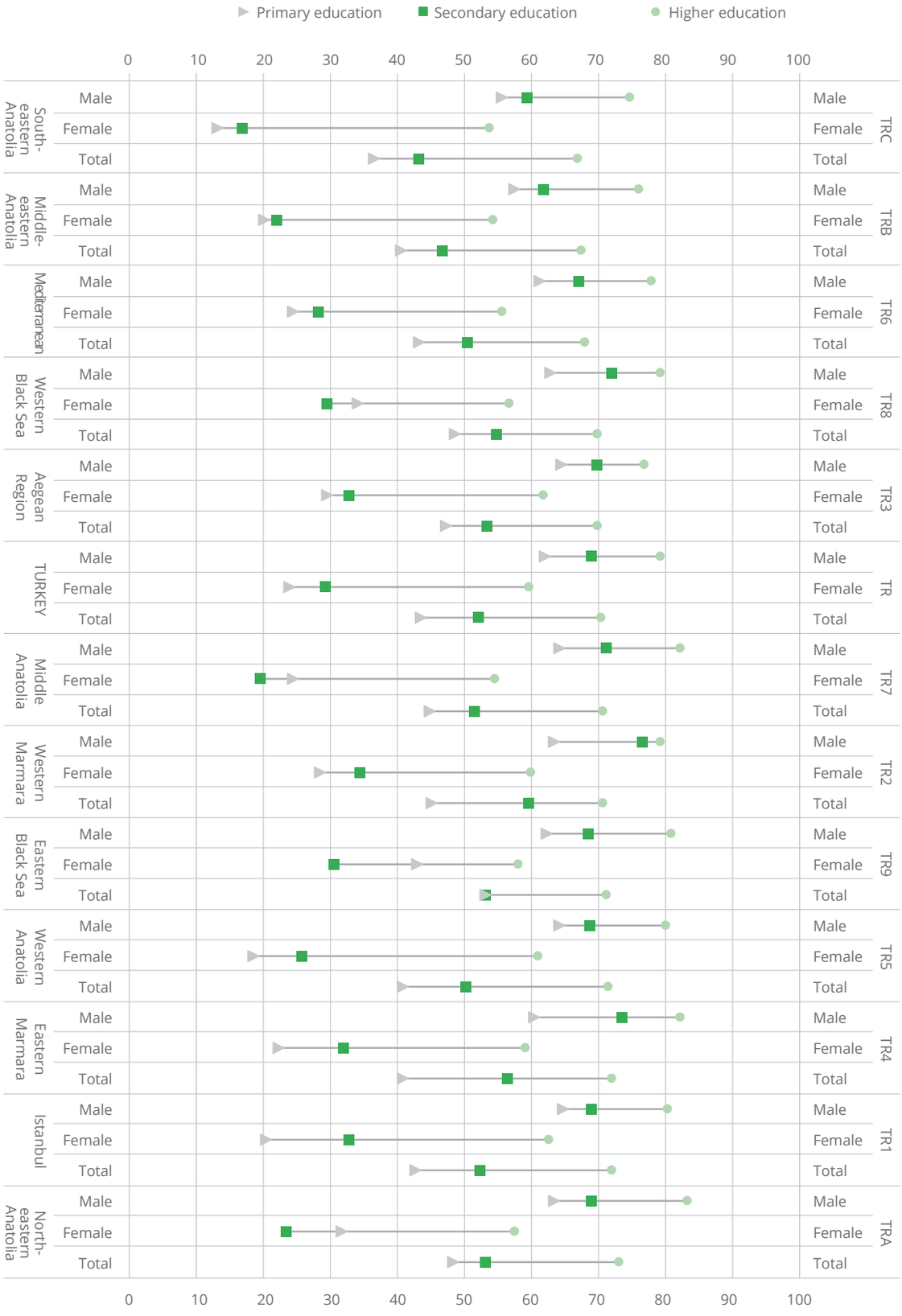
Work force participation rates by region, level of education and gender in 2016 are displayed in Figure C.4.3. It can be seen that these rates change significantly. Considering the work force participation rate of higher education graduates, Istanbul, South-eastern Anatolia and the Marmara regions surpass Turkey's average of 79.7%. Meanwhile, the Western Black Sea, Middle Anatolia, Western Anatolia and North-western Anatolia regions are on par with Turkey's average. However, the Aegean, Mediterranean, Western Marmara, Eastern Black Sea and Middle-eastern Anatolia regions are below Turkey's average. Workforce participation rates of female higher education graduates in Middle-eastern Anatolia, Eastern Black Sea, North-eastern Anatolia and the Middle Anatolia regions are below Turkey's average of 71.3%. Meanwhile, Western Marmara, the Mediterranean, Western Anatolia, Western Black Sea, Eastern Marmara and South-eastern Anatolia regions have a similar rate that is almost on par with Turkey's average. On the other hand, female higher education graduate's workforce participation rates in Istanbul and the Aegean region surpass Turkey's average. Turkey's average workforce participation rate of male higher education graduates is 86.4%. In Middle Anatolia, Eastern Marmara, South-eastern Anatolia and Istanbul, this rate is slightly above Turkey's average. Meanwhile, the rate in the Western Black Sea, Western Anatolia, and North-eastern Anatolia regions is on par with the average. The remaining regions, on the other hand, are below Turkey's average. While Istanbul and the Marmara regions provide more job opportunities for males and females, Middle-eastern Anatolia and Eastern

Figure C.4.3 Workforce participation rates by regions, level of education and gender (2016)



Source: Compiled using TURKSTAT workforce statistics.

Figure C.4.4 Employment rate by regions, level of education and gender (2016)



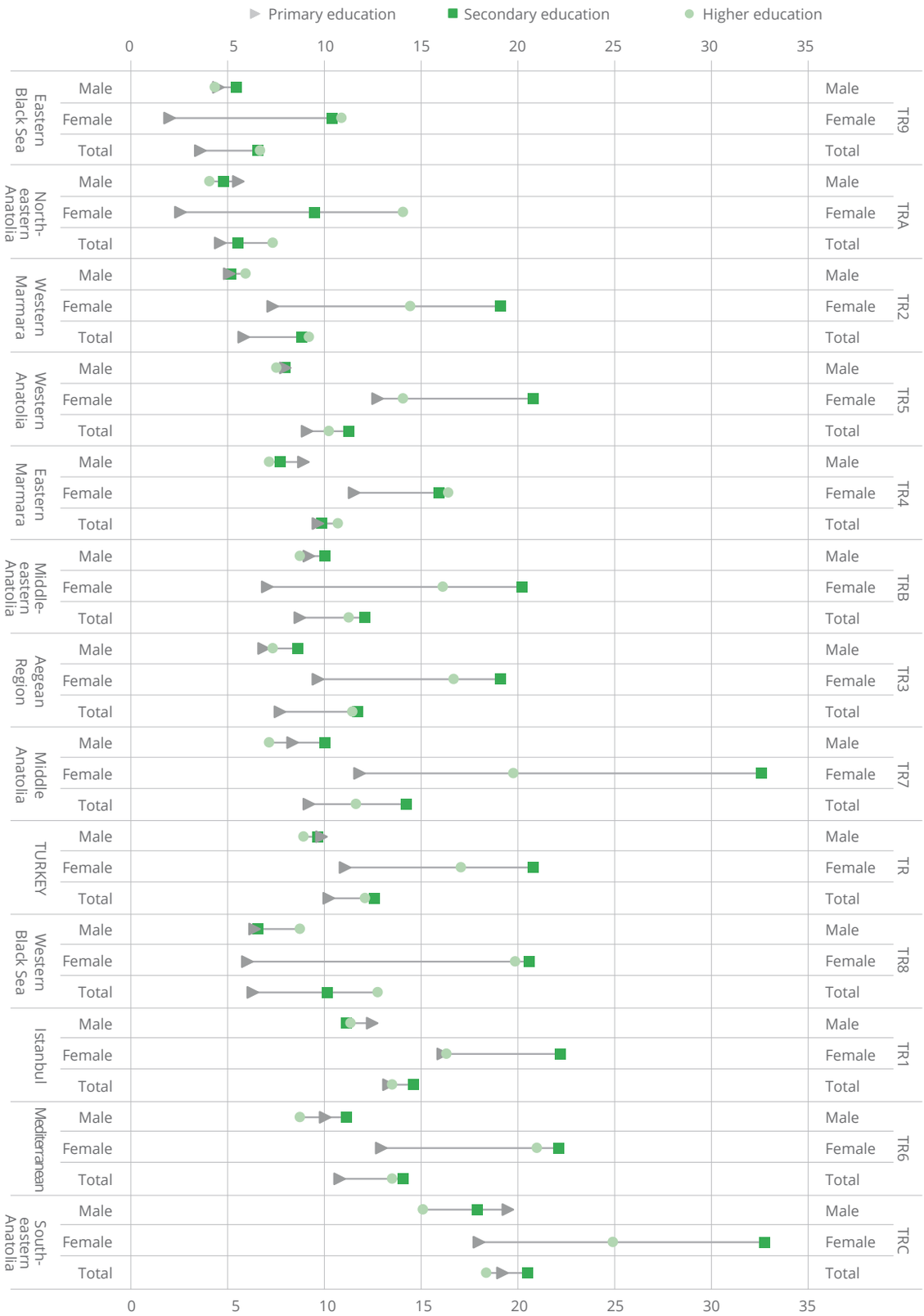
Source: Compiled using TURKSTAT workforce statistics.

Black Sea regions have limited prospects for workforce participation.

Employment rates by region, level of education and gender in 2016 are shown in Figure C.4.4. It can be seen that employment rates differentiate significantly by region, level of education and gender. Moreover, the distribution of the employment rate is divergent from the workforce participation rate's distribution. This situation is related to the predominant structures of sectors and properties of the available jobs. Considering higher education graduates' employment rates, North-eastern Anatolia, Istanbul, Eastern Marmara, Western Anatolia, Eastern Black Sea, Western Marmara and Middle Anatolia regions are over Turkey's average of 70.1%. On the other hand, the Western Black Sea, Aegean, Mediterranean, Middle-eastern Anatolia and South-eastern Anatolia regions have a lower employment rate than Turkey's overall average. Looking at female higher education graduates' employment rates, the Aegean, Western Marmara, Western Anatolia, Eastern Marmara and Istanbul regions are either on par with or higher than Turkey's average of 59.3%. In other regions, female higher education graduates' employment rates are below the average. Considering male higher education graduates' employment rates, North-eastern Anatolia, Istanbul, Eastern Marmara, Western Black Sea, Eastern Black Sea, Western Marmara and the Middle Anatolia regions are either on par with or above Turkey's average of 78.8%. The rate is below the average in all remaining regions. While economically developed regions like Istanbul and Marmara have more and diverse prospects for higher education graduates regardless of their gender, South-eastern Anatolia and Middle-eastern Anatolia regions have limited prospects for them. High employment rates of higher education graduates in regions like North-eastern Anatolia and Eastern Black Sea regions could be explained by low numbers of higher education graduates in these regions.

Unemployment rates by region, level of education and gender in 2016 are demonstrated in Figure C.4.5. It can be observed that unemployment rates by region, level of education and gender differ immensely. Moreover, the female unemployment rate is higher than the male unemployment rate. While higher education graduates' unemployment rates are higher than Turkey's average of 12% in the Western Black Sea, Istanbul, Mediterranean and South-eastern Anatolia regions, remaining regions are below the average. Looking at the female higher education graduates' unemployment rate, the Aegean, Middle Anatolia, Western Black Sea, Mediterranean and South-eastern Anatolia regions are either on par with or above Turkey's average of 16.9%. When compared with other regions, the Eastern Black Sea region has the lowest unemployment rate among female higher education graduates. In terms of male higher education graduates, South-eastern Anatolia and Istanbul have higher unemployment rates than Turkey's average of 8.8%. In other regions, unemployment rates are either on par with or below Turkey's average. Unemployment rates in the Eastern Black Sea (4.1%) and North-eastern Anatolia (3.9%) regions are significantly lower than Turkey's average. The reason behind the lower unemployment rates among higher education graduates in regions like Eastern Black Sea and North-eastern Anatolia is most likely due to the lower number of higher education graduates residing in these regions.

Figure C.4.5 Unemployment rates by region, level of education and gender (2016)



Source: Compiled using TURKSTAT workforce statistics.

INDICATOR C5

EDUCATION and INCOME

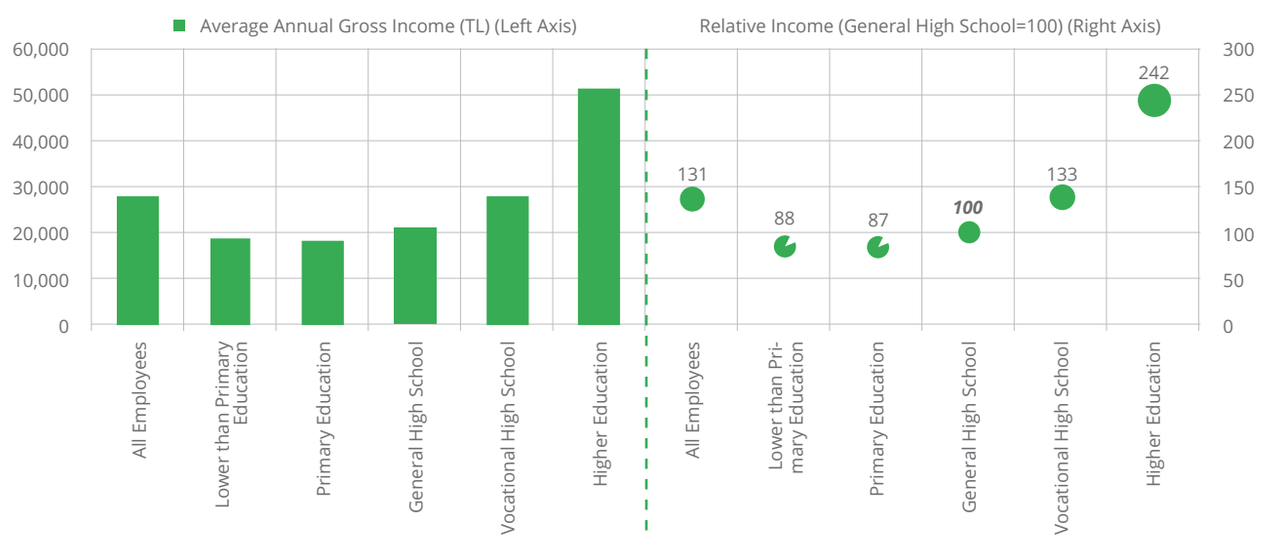
Work force participation, employment and unemployment rates are usually considered as educational outputs. On the other hand, concepts such as level of education and income provide a basis for correlation (Eğitim-Bir-Sen, 2016). Relations between education and income are analysed in this part.

Average gross income by level of education in 2014 is shown in Figure C.5.1. The data indicates that higher levels of education lead to higher income. Determining general high school graduates as a point of reference, individuals who are higher education graduates have an annual gross income that almost triples the income of general high school graduates. Moreover, there is a significant difference between the income of general and vocational high school graduates. According to the data, for every 100 units general high school graduates earn, vocational high school graduates will earn 133 units. This clearly indicates that vocational high school graduates are more advantageous than general high school graduates in terms of income.

The relative income of full-time working adults between the age 25-64 in OECD countries according to level of education is displayed in Figure C.5.2. According to the data, higher education graduates earn more than secondary or lower level of education graduates in all OECD countries. However, **when compared with the average of OECD countries, it can be seen that college graduates in Turkey earn proportionally more than high school graduates.** In other words, in comparison with other OECD countries, being a college graduate in Turkey has a more prominent effect on income. This advantage is one of the primary reasons behind the increasing demand for higher education in Turkey.

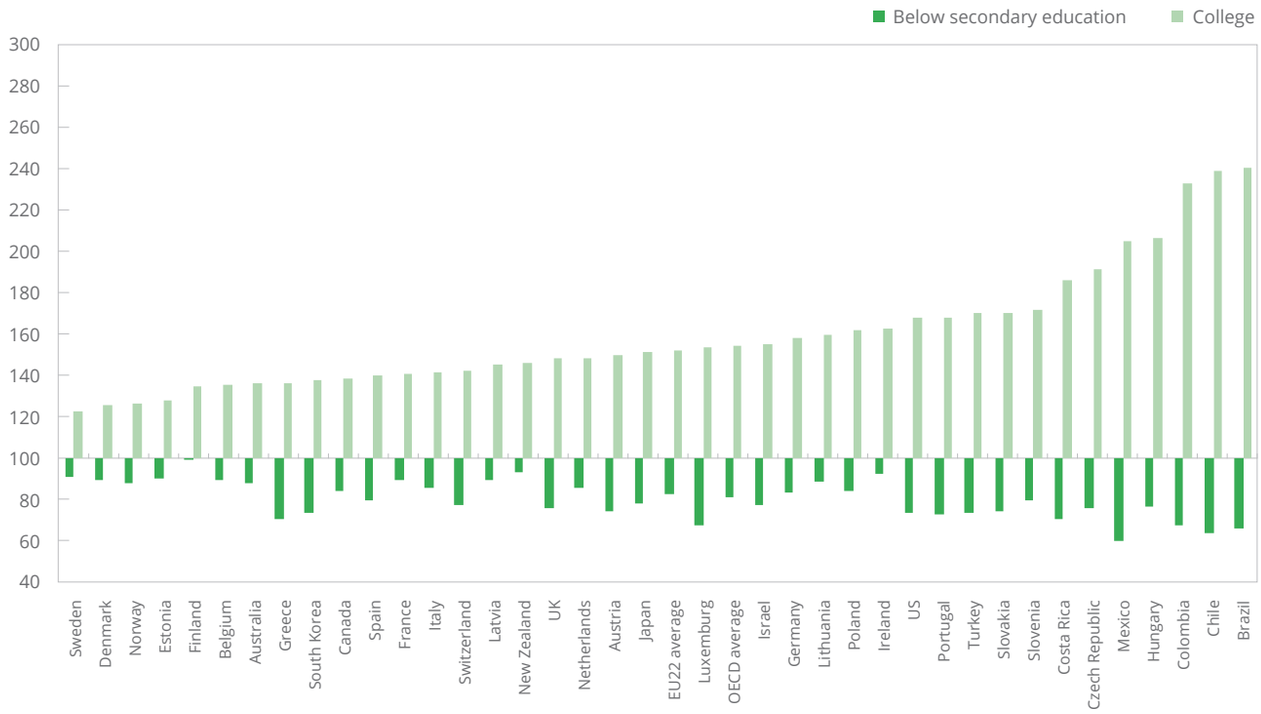
Average gross income according to gender and level of education is shown in Figure C.5.3. According to the data, male employees earn more than females at all levels of education. In other words, male employees earn more than female employees with the same level of education. The annual gross income by gender differs the most among vocational high school graduates. Female vocational high

Figure C.5.1 Average gross income by level of education (2014)



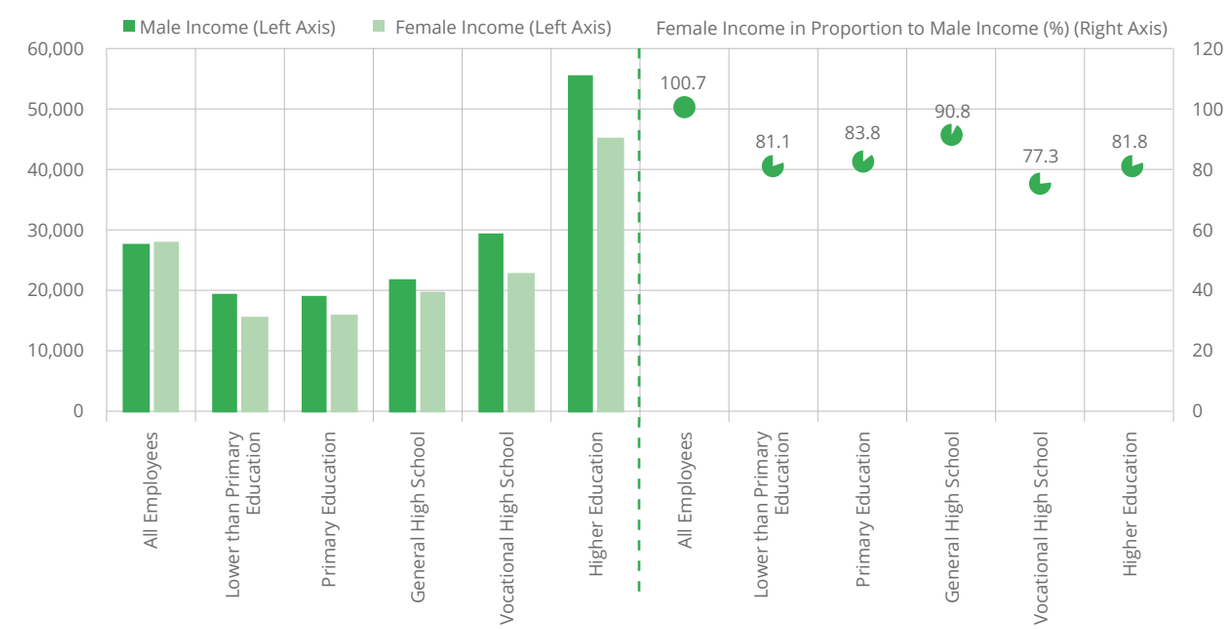
Source: Compiled by Eğitim-Bir-Sen (2016) using TURKSTAT Income Structure Survey data.

Figure C.5.2 Relative income of full-time working adults between the age 25-64 in OECD countries by level of education (2014)



Source: OECD (2016).
Note: Secondary education graduate=100

Figure C.5.3 Average annual gross income by gender and level of education (2014)

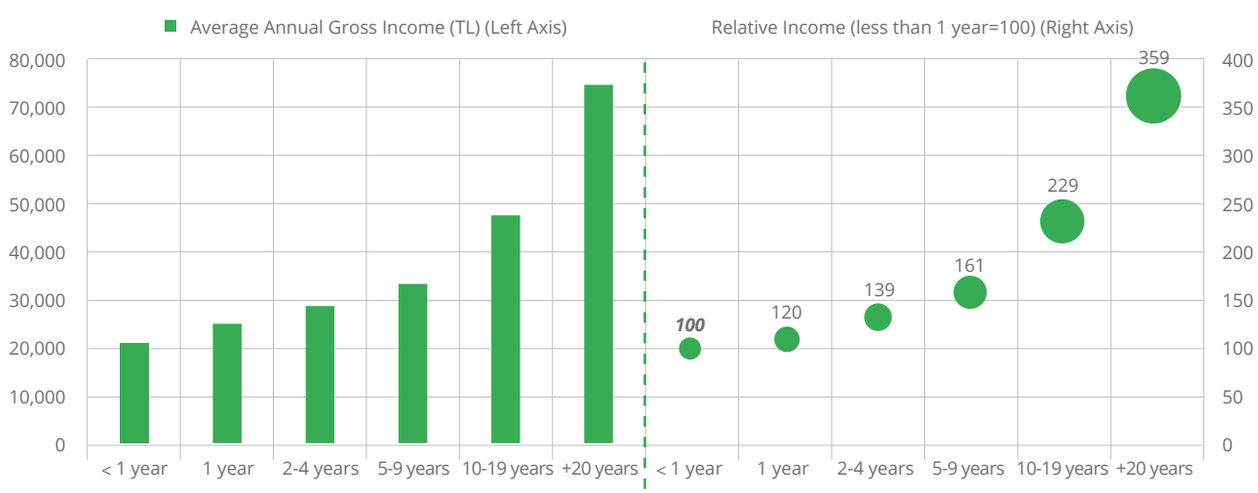


Source: Compiled by Eğitim-Bir-Sen (2016) using TURKSTAT Income Structure Survey data.

school graduates earn 77 units for every 100 units earned by males. At levels of education lower than the primary level, females earn 81 units for every 100 units earned by males; at the primary level, females earn 84 units for every 100 units earned by males. Meanwhile, at the level of secondary education, females earn 91 units for every 100 units earned by males; and at the higher education level, they earn 82 units for every 100 units earned by males. Looking at the average income of all, regardless of their levels of education, males' average annual gross income (TL 27,775) is lower than females' (TL 27,974). The probable cause of this situation, that is to say why females are seemingly earning more than males, is that majority females employed t are graduates of higher education (Eğitim-Bir-Sen, 2016).

Average annual gross income of employees according to years of experience is shown in Figure C.5.4. According to the 2014 data, average annual gross income is subject to a significant increase as years of experience increases. Determining 1 year or less as a point of reference, those who have over 20 years of experience almost quadruple the annual gross income of employees with 1 year or less experience. While employees with 1 year or less experience earn 100 units, those with 5-9 years of experience earn 161 units, those with 10-19 years of experience earn 229 units and those with over 20 years of experience earn 359 units. This data indicates that there is a significant increase in income in the labour market according to years of experience. In this respect, **one of the predominant factors that determines income in Turkey's labour market is years of experience.** However, increase in income according to years of experience for public sector employees shows a different trend than the general workforce. Civil servants and especially teachers have a very limited increase in salary (Eğitim-Bir-Sen, 2016). In OECD countries, on the other hand, there is a significant difference between the salaries of a newly beginning teacher and those with 15 years of experience. According to the OECD average, a high school teacher begins with an annual salary of $34,000 which then increases to $46,000 at 15 years of experience with a potential to rise up to $56,000 eventually. In Turkey, however, taking purchasing power parity into consideration, a teacher begins with a $28,000 annual salary, which increases to $30,000 after 15 years of experience, eventually rising up to the maximum of $32,000 (OECD, 2016).

Figure C.5.4 Average annual gross income of employees by years of experience (2014)



Source: Compiled by Eğitim-Bir-Sen (2016) using TURKSTAT Income Structure Survey data.

CHAPTER C

HIGHLIGHTS

In this section, the population's level of education was firstly analysed. Population's level of education and higher education system performance were discussed. According to the data, the total rate of higher education graduates has increased from 10% to 17% in 2015; meanwhile female's rate rose from 8% to 14% and the male's rate rose from 14% to 20% (Figure C1.1.1). **Even though Turkey progressed significantly in increasing the rate of higher education graduates, it still lags behind the OECD average.** While the rate of higher education graduates between the age of 25-64 is 18% in Turkey, the average of OECD countries is 36% (Figure C.1.2).

Among the 25-29 age group, 32.4% of females and 31.9% of males are higher education graduates; on the other hand, among the 60-64 age group, 5.4% of females and 8.7% of males are higher education graduates (Figure C.1.3). This disparity can be explained by the limited access to higher education institutions in the past. There is a prominent change in the rate of higher education graduates by region and gender between the years 2010-2015. The most significant change in this respect was in South-eastern Anatolia; 102% increase for males, 166% for females and a 124% total increase in rates was observed (Figure C.1.4). The fast growth in the number of higher education graduates, especially females, in South-eastern Anatolia, Middle-eastern Anatolia and the North-western Anatolia regions is possibly caused by the opening of new universities, the increase in quotas and removal of tuition fees (see **Chapter B: Access and Participation to Higher Education**).

Among people over the age 25, the highest higher education graduation rate is in Ankara (28%). Eskişehir (21%), Istanbul (21%), İzmir (20%), Tunceli (19%) and cities like Antalya, Muğla, Yalova, Kocaeli, Isparta and Trabzon (17%) follow Ankara. On the other hand, cities like Yozgat, Muş, Şanlıurfa and Ağrı have the lowest higher education graduation rates of (Figure C.1.5). While the rate of higher education graduates is higher in cities that are more economically developed and cater to the employment prospects of higher education graduates, this rate is lower in cities that have limited prospects for higher education graduates.

Even though the number of annual master's degree graduates increased from 7,000 to 43,000 and the number of doctorate graduates increased from 2,000 to 6,000 between the years 1996-2015 (Figure C.1.6), there are less higher education graduates in Turkey compared to more developed countries. For instance, according to 2014 data, **the US, Germany, the UK and Japan had 67,000, 28,000, 25,000 and 16,000 doctorate graduates, respectively** (Figure C.1.13). Indeed, Turkey's rates of master's degree and doctorate program graduates are low. Considering Turkey's need for faculty and international equivalents regarding the number of doctorate graduates, it is certain that Turkey has a significant deficit of doctorate graduates.

Looking at the rates of master's degree and doctorate graduates according to gender and age groups, the numbers and rates of master's degree and doctorate graduates among the 30-45 age group are higher than other age groups. **On the other hand, the numbers and graduation**

rates of master's degree and doctorate students are fairly low. Secondly, females have higher numbers and f master's degree and doctorate graduation rates in younger age groups when compared to males. Two possible reasons behind this are males beginning and finishing higher education later than females and males having to complete their compulsory military service. **There is an increase in the number of doctorate graduates among the 45+age group, regardless of gender.** The most probable reason is that the massification of education in Turkey was realized later than most countries, around the 1990s and 2000s for higher education (see **Chapter B: Access and Participation to Higher Education**).

Looking at the distribution of the number of master's degree and doctorate program graduates over the age 25 per 1,000 persons by city, it can be seen that İzmir, Ankara, Eskişehir, Isparta and Sivas are the ones with the highest number of master's degree and doctorate graduates. Furthermore, Şanlıurfa, Yalova, Istanbul and Kırıkkale are among the cities that have the highest number of master's degree graduates (Figure C.1.11 and Figure C.1.12). The number of universities in the city and their capacity, the city's population and employment prospects are some of the factors that affect the number of master's degree and doctorate graduates. The lowest number of master's degree and doctorate graduates are mostly in cities located in Eastern and South-eastern Anatolia regions. In general, the number of master's degree and doctorate graduates in Turkish cities are fairly low.

The number of annual higher education graduates has increased from 175,000 to 803,000 between the years 1996-2015 (Figure C.2.1). The number of associate degree graduates almost quintupled in the given period. Turkey has experienced a significant increase in the number of higher education graduates in the recent years. In terms of master's degree graduates, the number has increased from 9,000 to 49,000 between the years 1996-2015.

Looking at the trends in gender distribution over time, it can be seen that there is a shift between 1996-2015 in favour of females. In 1996, 73 females graduated for every 100 males at the bachelor's degree level; in 2015, however, this number increased to 118 females for every 100 males (Figure C.2.2). Increasing higher education participation rate of females along with females tending to be more successful than males are some of the reasons that explain female dominance over males in terms of higher education graduation rates.

With the decision taken by BHE, universities have now been able to admit as many students as they want into teaching certificate programs for the last two years. Thus almost all candidates who want to take teaching certificate programs are able to do so. Considering that teaching certificate programs are accessible to all, it can be assumed that the number of teacher candidates will increase significantly in the following years. In other words, **as almost everyone is allowed to take teaching certificate programs, the present number of "unassigned teachers" could possibly increase by hundreds of thousands.** This situation has become a pressure point for MONE and the government.

The number of applicants to ALES changes over the years and different periods. Because of the prospective university graduates, participation rates in the ALES Spring exams have increased. The

record high participation in ALES occurred in Spring 2014 with 453,000 applicants (Figure C.2.4). In the following sessions, the number of applicants was almost halved. The primary reason behind the decline of applications could be the removal of ALES as a criteria for master's degree programs without thesis with a law implemented in 2012. Moreover, the nullification of Faculty Member Training Program (ÖYP), the decrease in the number of positions for research assistants and ALES's validation being extended from two years to three years could also be additional factors which affected ALES applications.

The number of KPSS general knowledge and general ability tests applicants have skyrocketed between 2005-2016, reaching 1.2 million (Figure C.3.1). **Even though 450,000 people graduated from higher education institutions in 2016, it is remarkable that 1.2 million applications were made to KPSS exam.** The reason behind the high number of KPSS applications is the public sector's appeal.

ÖABT was added to KPSS for teacher candidates. First implemented in 2013 with 15 subfields, ÖABT will be held in 2017 with 17 subfields. For teacher candidates, half of the total score is determined by ÖABT. The exam consists of 50 questions; the content is expected to be compatible with university curriculum in general terms and with primary or secondary school curricula in respective fields. As ÖABT relies on knowledge, applicant's scores are prominent. There are fluctuations in the average scores of tests by year. Nevertheless, it can be seen that the average scores of many fields are fairly low. For instance, the average score of the mathematics test in 2016 was 10, while the average score of primary school mathematics test was 14 in 2014. It is a crucial issue that should be considered. It is seen that students entering these tests are graduating with inadequate levels of knowledge. This is indeed a prominent indicator of the qualifications of faculty of education graduates.

ÖABT tests aim to assess the field knowledge of teacher candidates. In this respect, the average scores of ÖABT tests are fairly low. This indicates that the candidate's field knowledge is limited. Therefore, the ability of these candidates -who clearly have inadequate knowledge- to lecture students on these subjects is put into question. This situation also calls for a discussion on the quality of education provided by universities.

According to 2015 data, around 275,000 students study in faculties of education. 460,000 have taken the educational sciences test in 2016. Considering the 400,000 "unassigned teachers" that have already graduated and have entered the KPSS exam, 300,000 students that are currently studying in faculties of education and 700,000 students that are eligible for teaching certificate programs, **it can be assumed that around 1 million teacher candidates will apply to KPSS educational sciences test in the near future.** However, around 50,000 teachers are appointed per year. Moreover, according to assessments, the educational system currently needs 90,000 more teachers to be appointed to satisfy the demand (Eğitim-Bir-Sen, 2016). This indicates that teacher appointments in large numbers will end soon. In such a case, the issue publicly known as the "unassigned teachers" will be brought in front of MONE and the government.

The workforce participation rate among university graduates between the years 2000-2016 has increased from 78.2% to 79.7%. In terms of general high schools, this rate increased from 50.9% to 54.4%; meanwhile, in terms of vocational high schools, this rate has decreased from 66.2% to 65.9%. The employment rates between the years 2000-2016 decreased from 72.7% to 70.1% for higher education graduates and from 58.9% to 58.2% for vocational high school graduates. On the other hand, the employment rate of general high school graduates increased from 45.6% to 47.2%. The unemployment rates increased from 7% to 12% among higher education graduates, from 10.5% to 13.4% among general high school graduates and from 10.9% to 11.6% among vocational high school graduates. Indeed, **there is a positive relation between the level of education and workforce participation.** Higher education graduates have a higher workforce participation rate than general and vocational high school graduates (Figure C.4.1).

Looking at the employment rates of females and males in OECD countries, it can be seen that there is a 10% difference at the disadvantage of females. This difference is 20% in Turkey (OECD, 2016). In countries like France, Finland, Austria, Belgium and Sweden, the employment rates of females and males are almost on par with each other (Figure C.4.2).

An interesting aspect of the unemployment rate in Turkey is that the unemployment rates of all graduates, regardless of the level of education, are similar (Figure C.4.1). This indicator is especially crucial for higher education graduates who are assumed to have attained certain skill sets. In other words, the overview of unemployment rates indicates that the value of level of education attained in the labour market has to be reassessed.

Workforce participation rates of higher education graduates by region (Figure C.4.3), and differentiation between employment and unemployment rates by gender (Figure C.4.4 and Figure C.4.5) are believed to be related to economic development, employment prospects and the socio-cultural structure of regions.

Considering the gross income by level of education, employees who are higher education graduates have a higher annual gross income than those with lower levels of education. Moreover, taking general high school graduates as a point of reference, higher education graduates have an annual gross income that almost triples the income of general high school graduates (Figure C.5.1.) In OECD countries, higher education graduates also earn more than those with lower levels of education. However, the effect of being a higher education graduate is more prominent in Turkey when compared to OECD countries (OECD, 2016). When analysed according to gender, it can be seen that males earn more than females, regardless of their level of education (Figure C.5.3).

Lastly, in Turkey, income increases with years of experience. For instance, those who have more than 20 years of experience have an income that almost quadruples the income of an employee with 1 year or less experience. However, this increase in income is fairly limited in the public sector and especially for teachers (Eğitim-Bir-Sen, 2016).

CHAPTER C

RECOMMENDATIONS

- Despite the significant increase in the number of bachelor's degree, master's degree and doctorate graduates, these numbers are fairly low when compared with OECD countries. In order to have a more competitive economic structure and products with higher added-value, the number of higher education graduates is crucial. For this reason, special measures should be taken to increase the number of master's degree and doctorate graduates. **The diversification and improvement of research programs, stipends, support and incentive programs are important.**
- Considering that teaching certificate programs are made available to everyone and the current numbers of students in faculties of education, it is possible to have around 1 million teacher candidates in the following years. For this reason, being a teacher must be redefined and the standards for entrance must be elevated. **Double major programs, short term diploma and certificate programs must be encouraged.** Increased employment prospects in the private sector and the improvement of current working conditions along with establishing a healthy relation between the education system's outputs and the labour market's demands will create opportunities for new graduates.
- Employing qualified teachers is a prerequisite of an established high quality education system. However, looking at the ÖABT results, it can be seen that the average scores of teacher candidates are fairly low. For this reason, **MONE should not allow the appointment of teachers with inadequate knowledge and should establish a minimum score for exams.** Compatibility between university curriculum and MONE curriculum of respective fields must be achieved in ÖABT tests. Moreover, the low average scores in ÖABT tests must be analysed and further investigated by universities.
- **Considering that female higher education graduates are employed more and have a higher income, special measures should be taken in order to encourage females to complete their higher education studies.**
- Even though an "equal work, equal payment policy" has to be enforced according to the labour laws, the gap between genders is significant in the labour market. Considering the indicators that demonstrate that females earn less than males, regardless of their level of education, it can be argued that new policies that would fight discrimination against females in the labour market are required. Moreover, it can be seen that while the private sector has meaningful income increases in accordance with years of experience, the public sector lacks a relation between seniority and increases in income. **Policies that will ensure meaningful increases to employees' income along with seniority must be implemented.**

CHAPTER C

REFERENCES

Eğitim-Bir-Sen. (2016). *Eğitime bakış 2016: İzleme ve değerlendirme raporu.* [Outlook on Education 2016: Monitoring and evaluation report] Ankara: Eğitimciler Birliği Sendikası.

OECD. (2016). *Education at a glance 2016: OECD indicators.* Paris: Organisation for Economic Co-operation and Development.

ÖSYM. (2012). Basın duyurusu: Öğretmenlik Alan Bilgisi Testi (ÖABT) (10.12.2012) [Press release: Teaching Field Knowledge Test (ÖABT)]. Access May 16 2017. http://www.osym.gov.tr/TR,614/basin-duyurusu-ogretmenlik-alan-bilgisi-testi-oabt-10122012.html

ÖSYM. (2016). *2016 Akademik Personel ve Lisansüstü Eğitimi Giriş Sınavı (ALES) sonbahar dönemi kılavuzu* [Academic Personnel and Graduate Education Entrance Exam (ALES) Fall season manual]. Ankara: Ölçme, Seçme ve Yerleştirme Merkezi.

TURKSTAT. (2017). *İşgücü istatistikleri, Şubat 2017* (Haber Bülteni No. 24941) [Work force statistics, February 2017 (Bulletin No. 24941)]. Ankara: Türkiye İstatistik Kurumu.

CHAPTER D

ACADEMIC STAFF

As a result of the higher education expansion process around the world, there has been an effort to expand, diversify and restructure higher education systems in order to meet the increasing demand (Kavak, 2011; Küçükcan and Gür, 2009). Turkey has taken important steps towards this goal and its higher education system has become one of the fastest growing, particularly after 2006-2008 (Çetinsaya, 2014). As a result of this rapid growth there is an increasing need for adequate faculty, both in terms of quantity and quality. Indeed, the issue of academic staff has risen to prominence again in recent years as new universities are being established (Özer, 2011). Moreover, issues such as the majority of faculty members residing in provinces which have the biggest universities, and the criteria for appointing and promoting academic staff or faculty have been discussed in the context of higher education for a long time (BHE, 2007; Doğramacı, 2007; Tekeli, 2010).

The mission of universities described as education, research and public service are all carried out by academic staff. The concept of academic staff is used to encompass all academic personnel working in universities in Turkey. Academic staff consists of three classes according to the Higher Education Personnel Law. The classes of faculty members include professors, associate professors and assistant professors. Research assistants, specialists, translators and educational planners are part of the ancillary staff. In addition to the academic and ancillary staff there are instructors and language instructors.

This chapter primarily examines the number of academic staff employed in Turkish higher education institutions. In this context the trends in the number of academic staff according to academic title, university type, and gender have been presented. Following this, the trend in the number of international academic staff, according to academic title, university type, and gender has been reviewed. Finally, the academic staff supply and demand has been discussed. In this context the number of master's and doctoral students who were sent abroad were examined alongside their rates of graduation and return.

INDICATOR D1

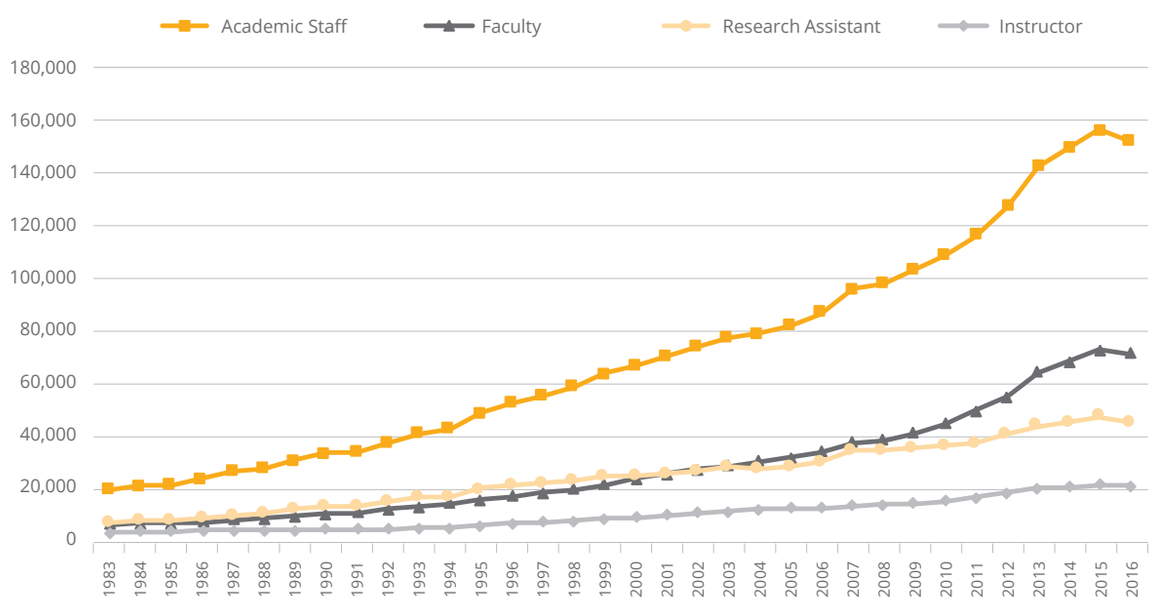
NUMBER OF ACADEMIC STAFF

This indicator presents various data concerning academic staff according to university type and academic title. Figures concerning academic staff have been calculated as the sum of faculty, instructors and language instructors alongside ancillary staff. Separate data has not been provided for language instructors, specialists, translators and educational planners thus they are presented in the category of other. This is due to the fact that since the total number of these title-holders is relatively small they have been presented within the faculty class.

Figure D.1.1 shows the number of academic staff employed in public and foundation higher education institutions in the period of 1983-2016. According to the figure, the number of academic staff increased constantly in the period between 1983 and 2016 from 20 thousand to 152 thousand. As of 2016 there are 71 thousand faculty members, 45 thousand research assistants, 21 thousand instructors and 14 thousand other academic staff adding up to a total of 152 thousand academic staff. (The reason for the decline in the number of faculty employed in foundation universities is that after the July 15, 2016 coup attempt, 15 foundation universities associated with the Fetullahist Terror Organization/ Parallel State Structure (FETÖ/PDY) were closed down.)

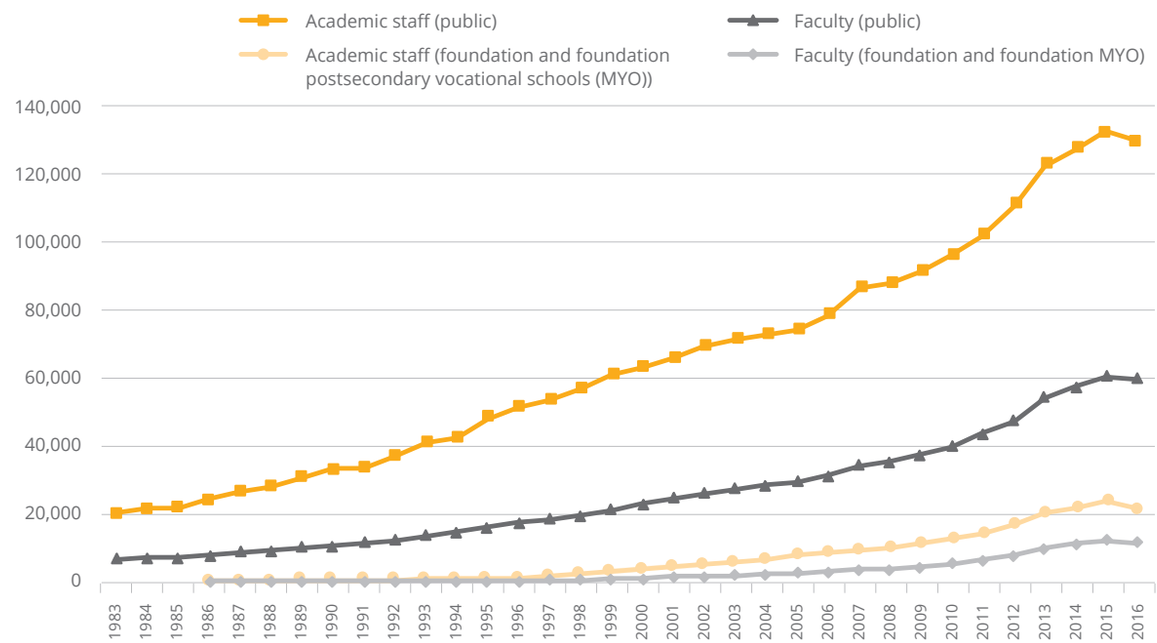
Figure D.1.2 shows the distribution of faculty and academic staff in the period of 1983-2016, according to the type of higher education institution (public/foundation) they are employed in. According to the figure, the number of faculty in public universities increased from 20 thousand to 130 thousand while the number of faculty increased from 7 thousand to 60 thousand in the 1983-2016 period. On the other hand, the number of academic staff in foundation universities increased to 22 thousand and faculty increased to 12 thousand in the period of 1986-2016. Since the number of foundation higher education institutions entered a period of rapid growth starting in 1997, the number of academic staff and faculty also increased rapidly.

Figure D.1.1 Trends in the number of academic staff employed in foundation higher education institutions (1983-2016)



Source: Compiled using Higher Education Information Management System and ÖSYM's data.

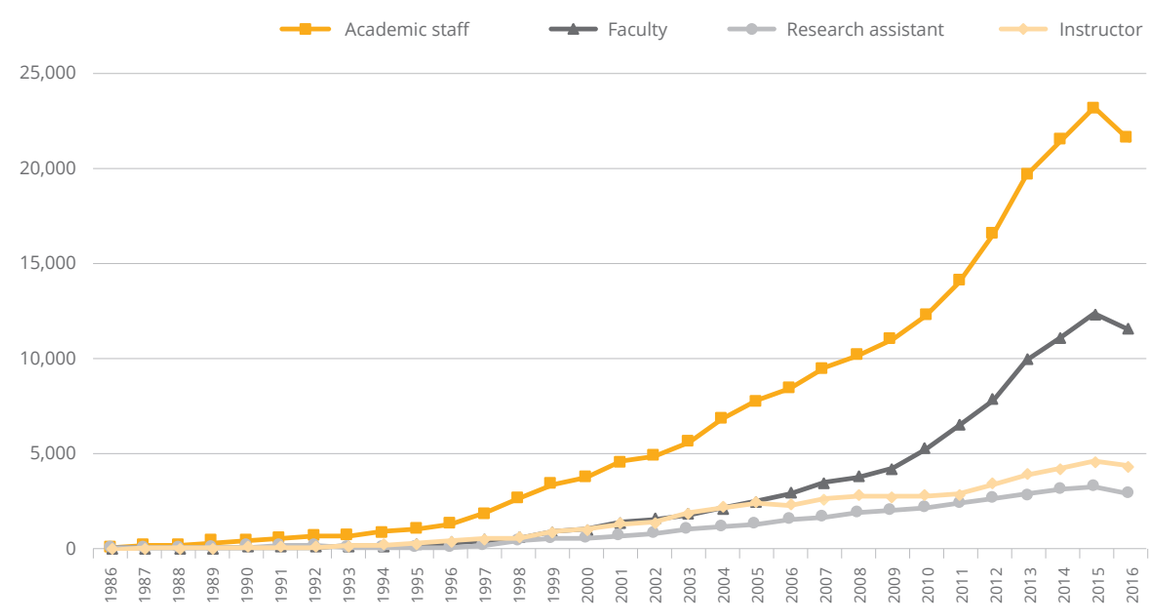
Figure D.1.2 Trends in the number of faculty and academic staff by higher education institution type (1983-2016)



Source: Compiled using Higher Education Information Management System and ÖSYM's data.

Figure D.1.3 shows the distribution of academic staff in foundation universities according to academic title and the trends in this distribution. According to the figure, the number of academic staff in Turkey has constantly increased. The increases in the number of academic staff after 1995 and 2006 are higher than in preceding years. While there were 400 academic staff in foundation universities in 1990, this number increased to 1,300 in 1996,

Figure D.1.3 Trends in the number of academic staff employed at foundation universities (1986-2016)



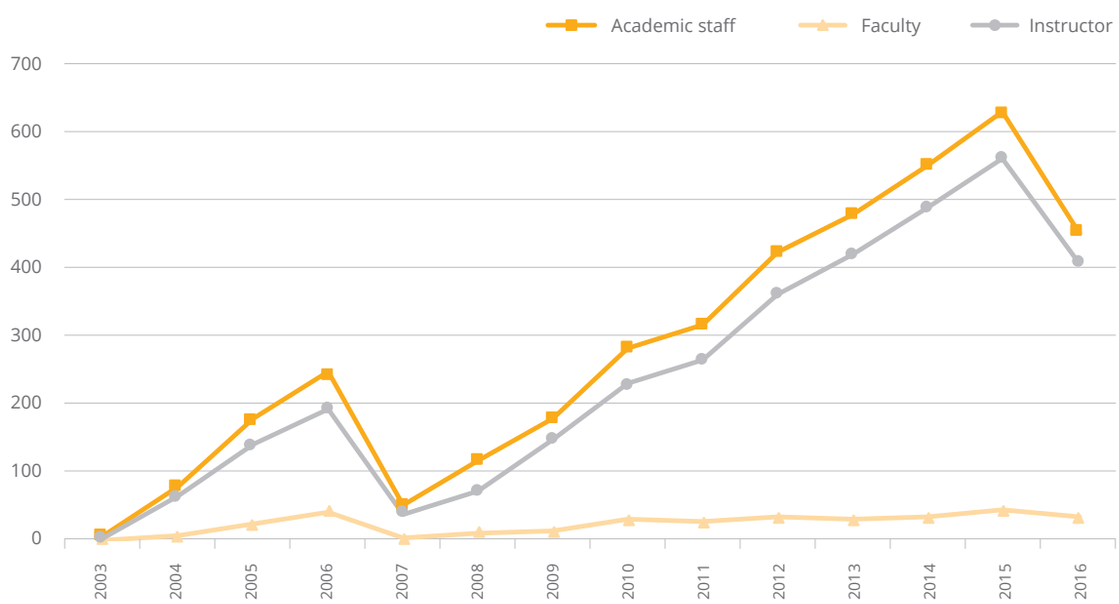
Source: Compiled using Higher Education Information Management System and ÖSYM's data.

10 thousand in 2008 and 21 thousand in 2016. When the distribution of academic staff employed in foundation universities is considered according to academic title, it can be seen that faculties and instructors occupy the largest share. About half of the academic staff are faculty and one fourth are instructors. Instructors occupy a larger share in foundation universities compared to public universities (see Figure D.1.2). About one seventh of total academic staff in Turkey are instructors. This shows that **the share of academic staff without a doctorate is much higher at foundation universities compared to public universities.** Foundation universities employ instructors rather than faculty to meet the need for academic staff to teach classes. While this creates the positive effect of opening the doors of foundation universities to individuals who have practical experience and are in close relation to the business world, it also leads to the employment of instructors over faculty due to their lower financial burden.

Figure D.1.4 shows the number of academic staff employed in foundation postsecondary vocational schools (MYOs) in the period of 2003-2016. As in the case of other higher education institutions the total number of academic staff in foundation MYOs has also increased over time. The trends in the number of academic staff in MYOs differ from other higher education institutions on two points. First, **the vast majority of academic staff at foundation MYOs are instructors.** In the year 2016, 403 of 540 total academic staff were instructors while only 33 were faculty members. The other difference in the academic staff profile of foundation MYOs is the absence of increase in the number of faculty. This situation shows that foundation MYOs do not employ academic staff with doctorates. Faculty members usually serve in an administrative capacity in these institutions. It is expected that these institutions which provide practical vocational training have less faculty with doctorates. However, the fact that faculties are almost non-existent in foundation MYOs is quite striking.

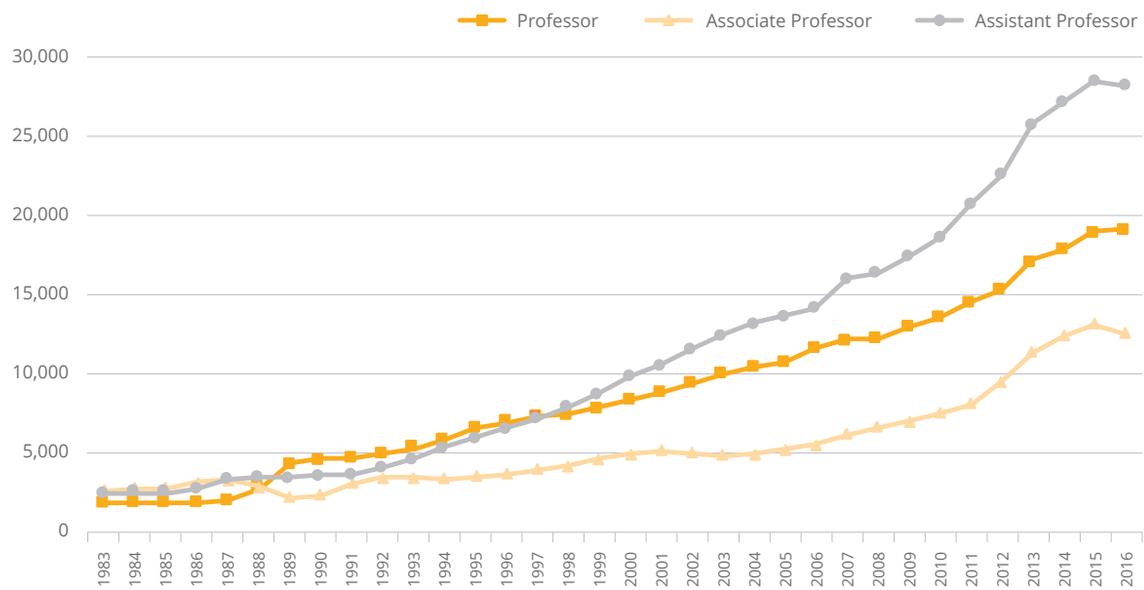
Figure D.1.5 shows the distribution of faculty members employed in public universities according to academic title in the 1983-2016 period. According to the figure, while there were around 2-2,5 thousand professors, associate professors and assistant professors in 1983, this increased steadily to 28 thousand assistant professors, 19 thousand professors, and 13 thousand associate professors in 2016. **The academic title group that experienced the largest increase over the years was that of associate**

Figure D.1.4 Trends in the number of academic staff employed in foundation postsecondary vocational schools (MYOs) (2003-2016)



Source: Compiled using Higher Education Information Management System and ÖSYM's data.

Figure D.1.5 Trends in the number of faculty members employed at public universities by academic title (1983-2016)

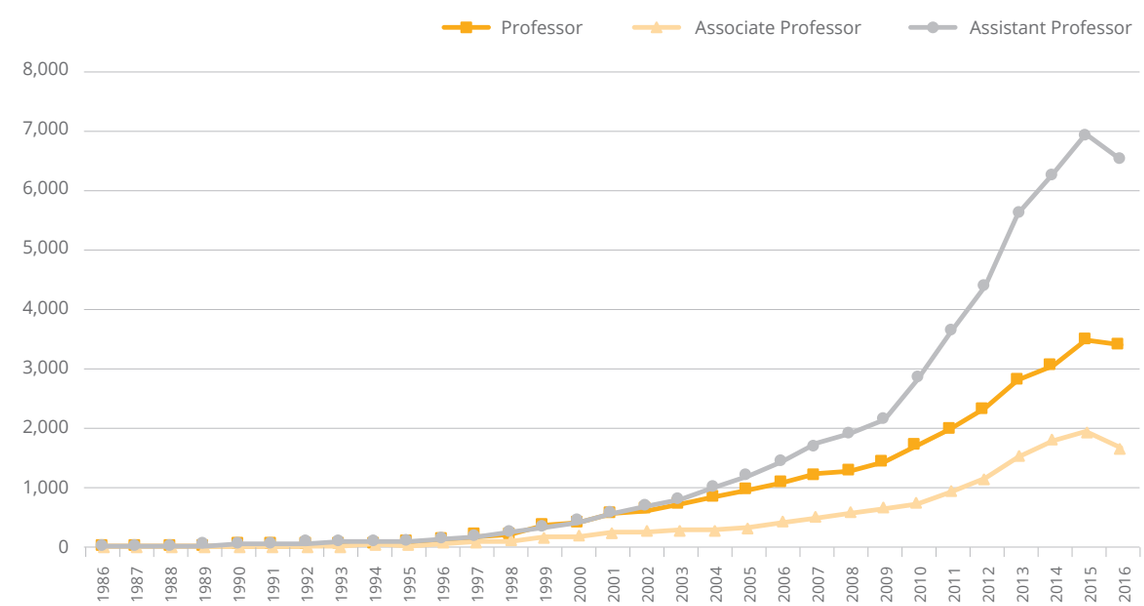


Source: Compiled using Higher Education Information Management System and ÖSYM's data.

professor. The increases in associate professors and professors were almost parallel. Promotion to full professor usually occurs after a 5-year waiting period after receiving the title of associate professor. Hence, there are more professors than associate professors because associate professorship is a transition period.

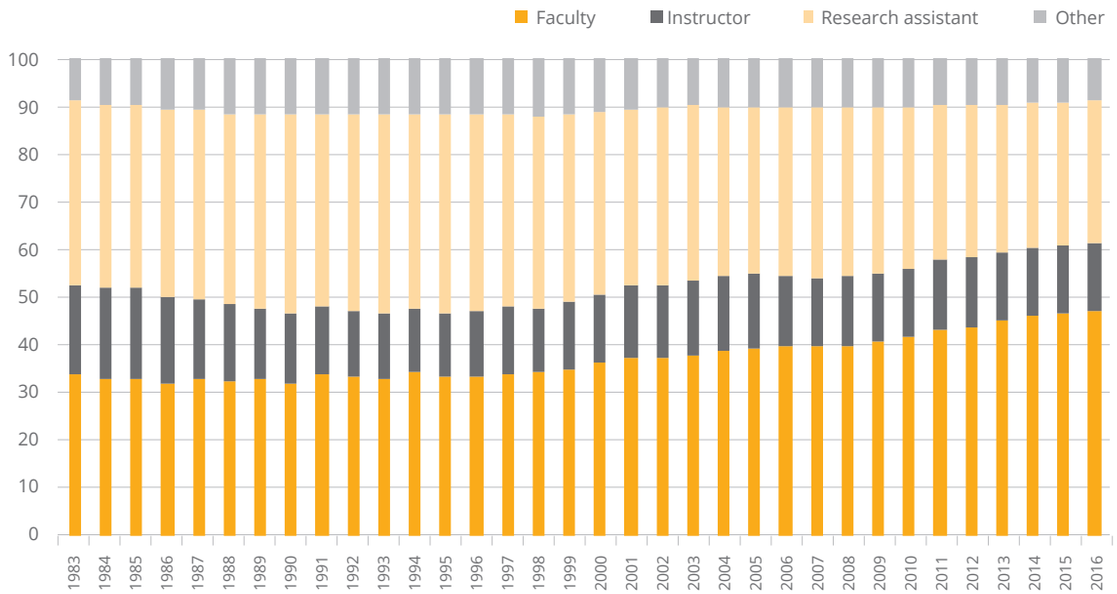
Figure D.1.6 shows the distribution of faculty employed at foundation higher education institutions (universities and

Figure D.1.6 The trends in the number of faculty members at foundation higher education institutions by academic title (1986-2016)



Source: Compiled using Higher Education Information Management System and ÖSYM's data.

Figure D.1.7 Trends in the proportional distribution of academic staff in higher education institutions by academic title (%) (1983-2016)



Source: Compiled using Higher Education Information Management System and ÖSYM's data.

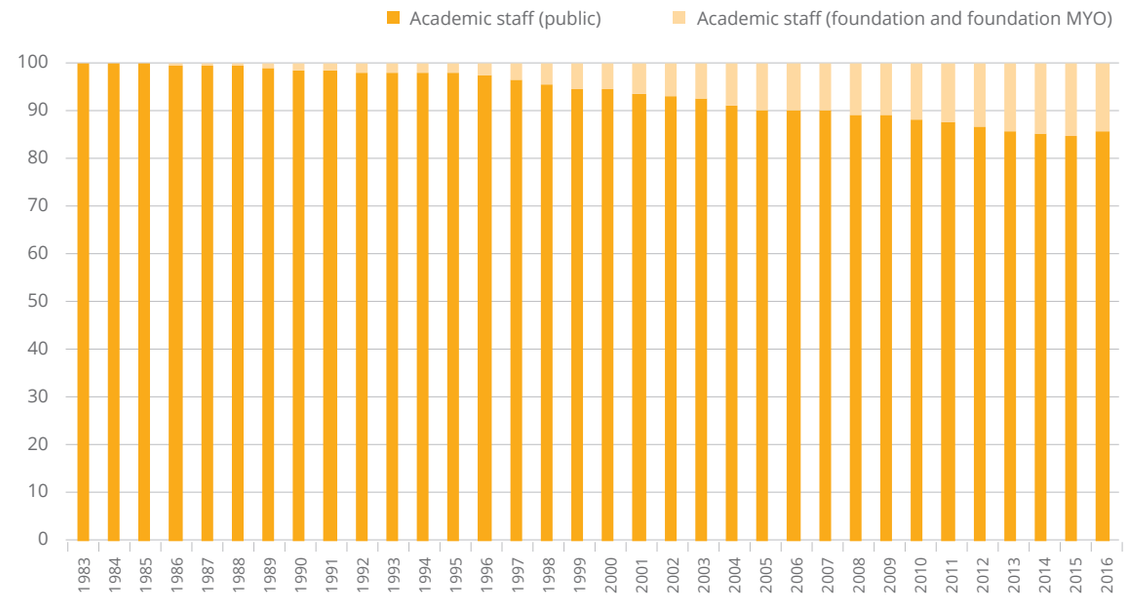
foundation MYOs) according to academic title. According to the figure, the number of academic staff increased constantly in the 1986-2016 period and as of 2016 there were 6500 assistant professors, 3500 professors and 1500 associate professors. According to this data, more than half of the faculty employed at foundation higher education institutions are assistant professors.

Figure D.1.7 shows the trends in the proportional distribution of academic staff at higher education institutions according to academic title in the period of 1983-2016. The ratio of faculty employed at universities increased from 34% to 47%; the research assistant ratio declined to 30% from 39%; the instructor ratio declined to 14% from 19%. **This shows that the number of f academic staff with doctorates has been increasing in recent years, which is a positive development.** On the other hand, the decline in research assistants which constitute the source of future faculty is important to note.

Figure D.1.8 shows the trends in the proportional distribution of academic staff according to higher education institution type in the period of 1983-2016. In the period of 1986-1991, the only foundation university was İ.D Bilkent University, in 1992 a second foundation university was established and in 1997 the number of foundation universities reached 16. As a consequence of this, only 5% of faculty were employed in foundation universities as of 1999. After 1999 the share of academic staff employed at foundation higher education institutions increased along with the establishment of new foundation universities and reached 14% in 2016.

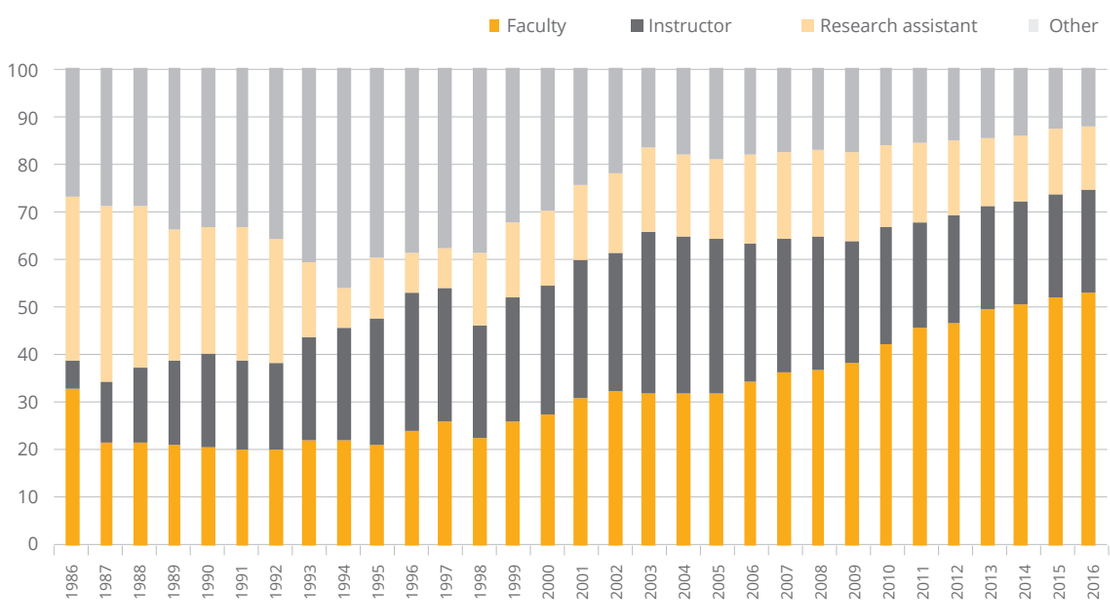
Figure D.1.9 shows the trends in the proportional distribution of academic staff employed at foundation higher education institutions according to academic title between 1986 and 2016. In the year 1997, 26% of academic staff were faculty, 8% were research assistants, 28% were instructors and 38% were other academic staff. As of 2016 there has been a significant increase in the share of faculty and a significant decline in the share of other academic staff. In 2016, among those employed at higher education institutions, 53% were faculty members, 22% were instructors, 13% were research assistants, 12% were other academic staff. When the share of academic staff is considered according to academic title, there is a differentiation

Figure D.1.8 Trends in the proportional distribution of academic staff by higher education institution type (%) (1983-2016)



Source: Compiled using Higher Education Information Management System and ÖSYM's data.

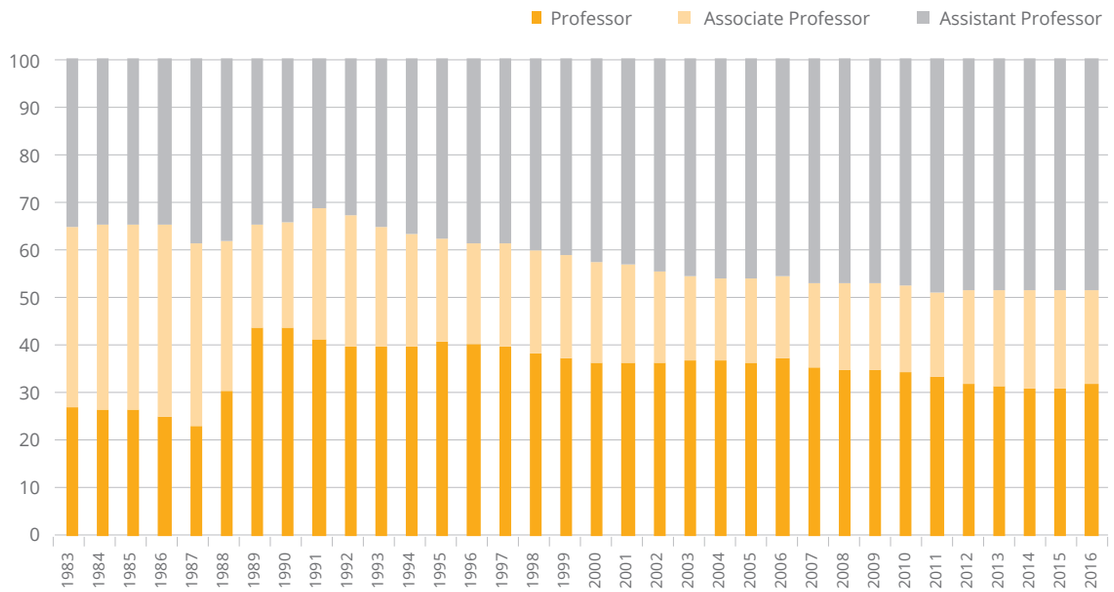
Figure D.1.9 Trends in the proportional distribution of academic staff employed at foundation higher education institutions by academic title (%) (1986-2016)



Source: Compiled using Higher Education Information Management System and ÖSYM's data.

between public universities and foundation higher education institutions. While the share of faculty with doctorates is higher at foundation universities, the share of research assistants who are training to become faculty at public universities is much higher at public universities. This shows that **foundation higher education institutions are carrying a smaller burden than public universities in terms of training their future faculty.**

Figure D.1.10 The trends in the proportional distribution of faculty employed at higher education institutions according to academic title (%) (1983-2016)



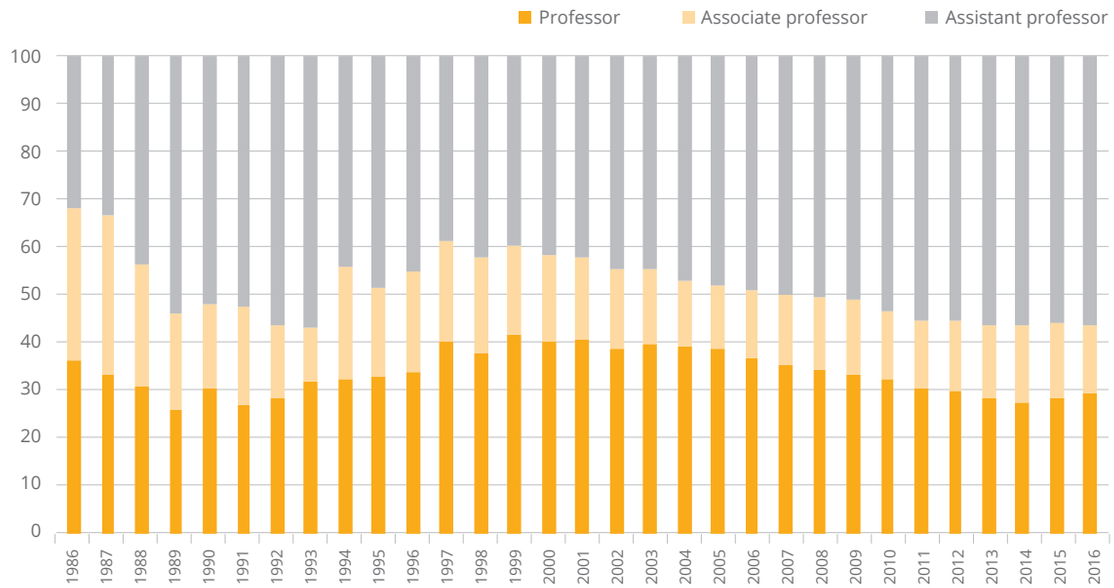
Source: Compiled using Higher Education Information Management System and ÖSYM's data.

Figure D.1.10 shows the trends in the proportional distribution of faculty members employed at higher education institutions according to title between 1983 and 2016. There has been a significant change in the distribution of faculty according to academic title in the 1983-2016 period. While 27% of faculty were professors, 38 were associate professors and 35% were assistant professors, in 2016 32% were professors, 20% were associate professors and 49% were assistant professors. Currently half of the faculty members in the system are employed as assistant professors.

Figure D.1.11 shows the trends in the proportional distribution of faculty at foundation higher education institutions (universities and foundation MYOs) according to academic title in the period of 1986-2016. According to the figure, 56% of faculty working at foundation higher education institutions are assistant professors, 29% are professors and 14% are associate professors. It can be observed that from 1999 onwards there is a decline in professors and an increase in assistant professors.

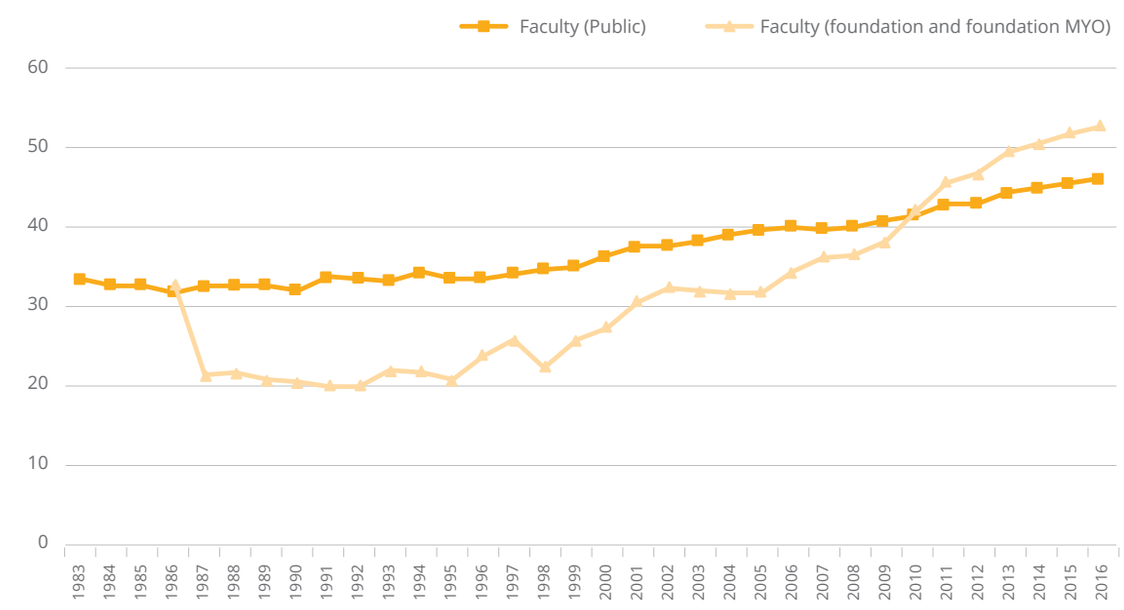
Figure D.1.12 shows the trends in the ratios of faculty among all academic staff according to institution type. The share of faculty among the total number of academic staff has generally increased from 34% to 46% in the period of 1983-2016. The share of faculty at foundation universities has also increased steadily after 1997, increasing from 22% to 53%. **The main reason for the increase in the number of faculty and their share at foundation universities is that they were able to attract faculty members who were working at public universities or were previously retired, through high salaries.**

Figure D.1.11 Trends in the proportional distribution of faculty members at foundation higher education institutions according to academic title (%) (1986-2016)



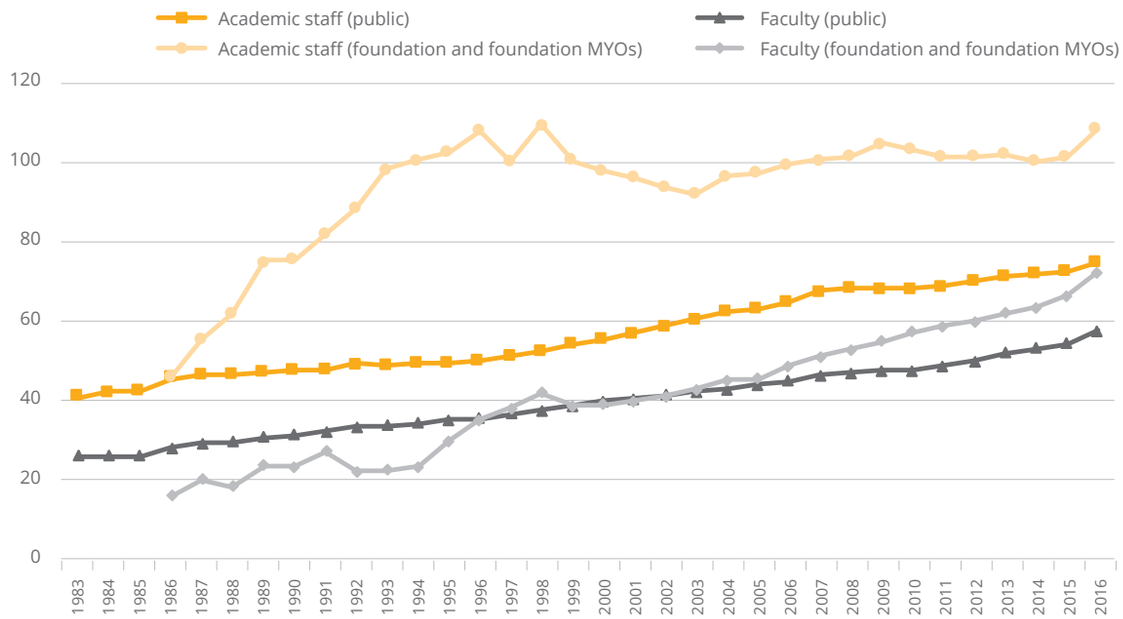
Source: Compiled using Higher Education Information Management System and ÖSYM's data.

Figure D.1.12 Trends in the ratios of faculty among all academic staff according to institution type (%) (1983-2016)



Source: Compiled using Higher Education Information Management System and ÖSYM's data.

Figure D.1.13 Trends in gender ratios for faculty and academic staff according to higher education institution type (1983-2016)



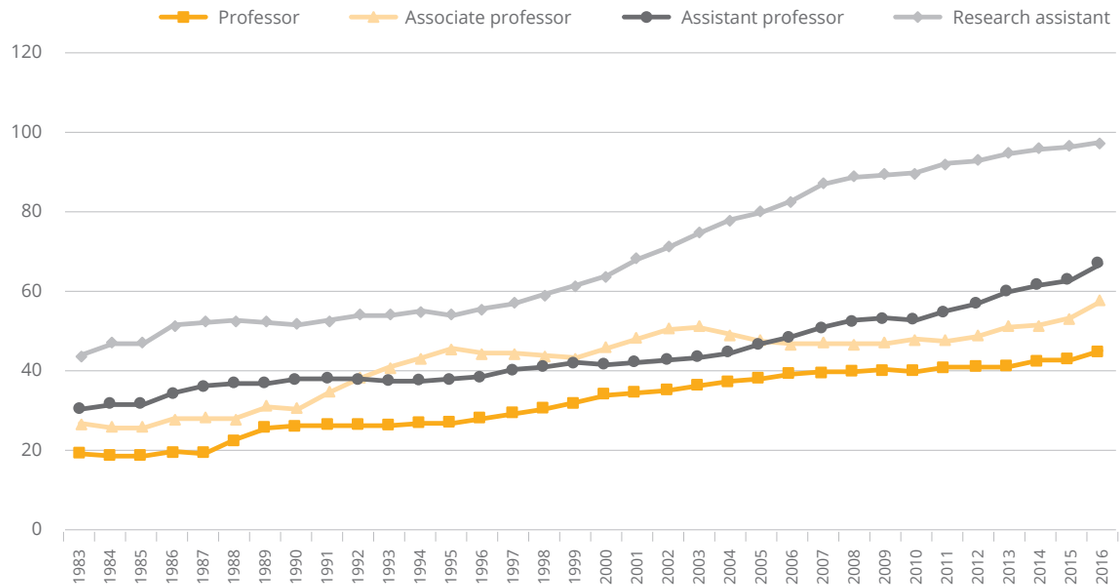
Source: Compiled using Higher Education Information Management System and ÖSYM's data.

Figure D.1.13 shows the trends in gender ratios for faculty and academic staff according to higher education institution type in the period of 1983-2016. While there were 41 females for every 100 males in the academic staff of public universities in the period of 1983-2016, this ratio increased steadily and reached 74 in 2016. In terms of instructors at public universities, while the gender ratio was 26 in 1983, this increased to 58 in 2016. The gender ratio of foundation higher education institution's academic staff fluctuated over the years and increased from 46 to 108 while the gender ratio of faculty increased from 16 to 72. **This data shows that there have been significant improvements in the gender ratios over time.**

Figure D.1.14 shows the trends in the gender ratios of faculty employed at higher education institutions according to academic title in the period of 1983-2016. In the period of 1983-2016 the gender ratio for professors increased from 19 to 45, from 27 to 58 for associate professors, from 30 to 67 for assistant professors, from 44 to 98 for research assistants. **This data shows that academic staff gender ratios have improved in favour of females over time across academic titles.**

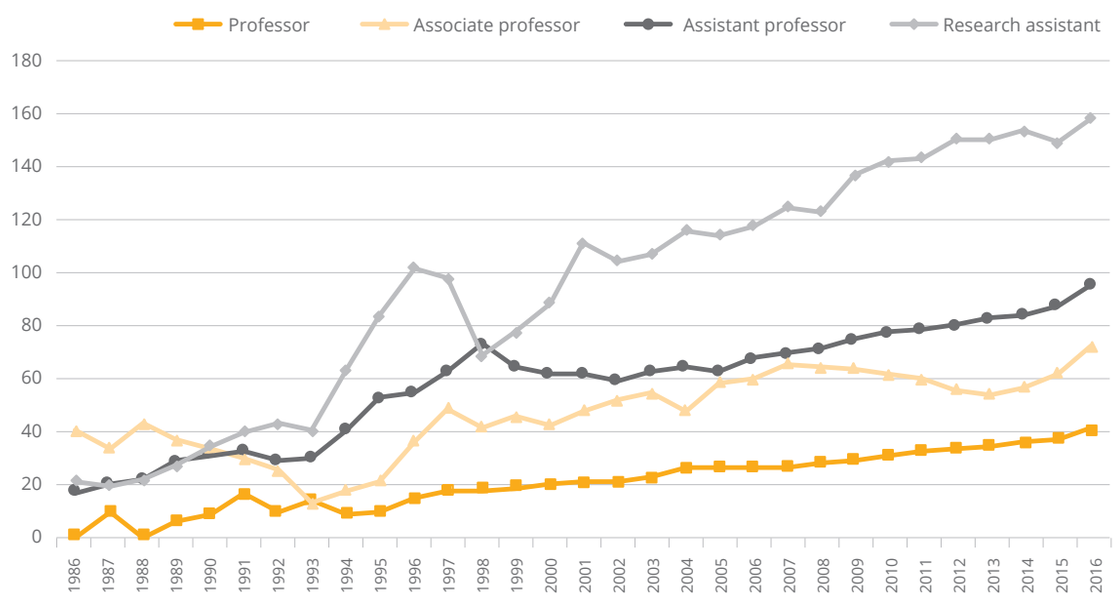
Figure D.1.15 shows the trends in the gender ratios of academic staff employed at foundation higher education institutions (universities and foundation MYOs) according to academic title in the period of 1986-2016. The gender ratio in foundation higher education institutions has increased to 41 for professors, 72 for associate professors, 95 for assistant professors and 158 for research assistants. According to this data, **the gender ratio at foundation higher education institutions has improved significantly for all titles.** It can be observed that the number of males and females are very close at the associate professor level while there are many more females than males at the research assistant level.

Figure D.1.14 Trends in the gender ratios of academic staff employed at higher education institutions according to academic title (1983-2016)



Source: Compiled using Higher Education Information Management System and ÖSYM's data.

Figure D.1.15 Trends in the gender ratios of academic staff employed at foundation higher education institutions by academic title (1986-2016)



Source: Compiled using Higher Education Information Management System and ÖSYM's data.

Table D.1.16 Number of academic staff according to higher education institution type (2017)

		Public	Foundation	Foundation postsecondary vocational schools (MYOs)	Total
Professor	Male	13,127	2,353	3	15,483
	Female	5,882	967	0	6,849
	Total	19,009	3,320	3	22,332
Associate professor	Male	7,972	945	3	8,920
	Female	4,582	693	0	5,275
	Total	12,554	1,638	3	14,195
Assistant professor	Male	16,759	3,177	13	19,949
	Female	11,238	3,051	14	14,303
	Total	27,997	6,228	27	34,252
Instructor	Male	9,973	1,447	104	11,524
	Female	6,485	2,158	182	8,825
	Total	16,458	3,605	286	20,349
Instructor (PhD)	Male	52	303	51	406
	Female	27	349	15	391
	Total	79	652	66	797
Research assistant	Male	21,259	1,098	0	22,357
	Female	20,720	1,731	0	22,451
	Total	41,979	2,829	0	44,808
Other (language instructors, specialist, educational planner)	Male	4,861	717	5	5,583
	Female	6,072	1,949	9	8,030
	Total	10,933	2,666	14	13,613
Total	Male	74,003	10,040	179	84,222
	Female	55,006	10,898	220	66,124
	Total	129,009	20,938	399	150,346

Source: Compiled on 28/03/2017 using the Higher Education Information Management System data.

Table D.1.16 shows the number of academic staff according to higher education institution type based on March 2017 data. The total number of academic staff at public universities is 129 thousand, while 74 thousand of these are male 55 thousand are female. **The ratio of female faculty members declines at both public and foundation universities as the title gets higher.** The groups that have the most female academic staff at public universities are research assistants and assistant professors. On the other hand, at foundation universities the number of female academic staff is higher than males. The main reason for this is that foundation universities have higher female ratios at the research assistant, instructor and language instructors' levels compared to public universities..

INDICATOR D2

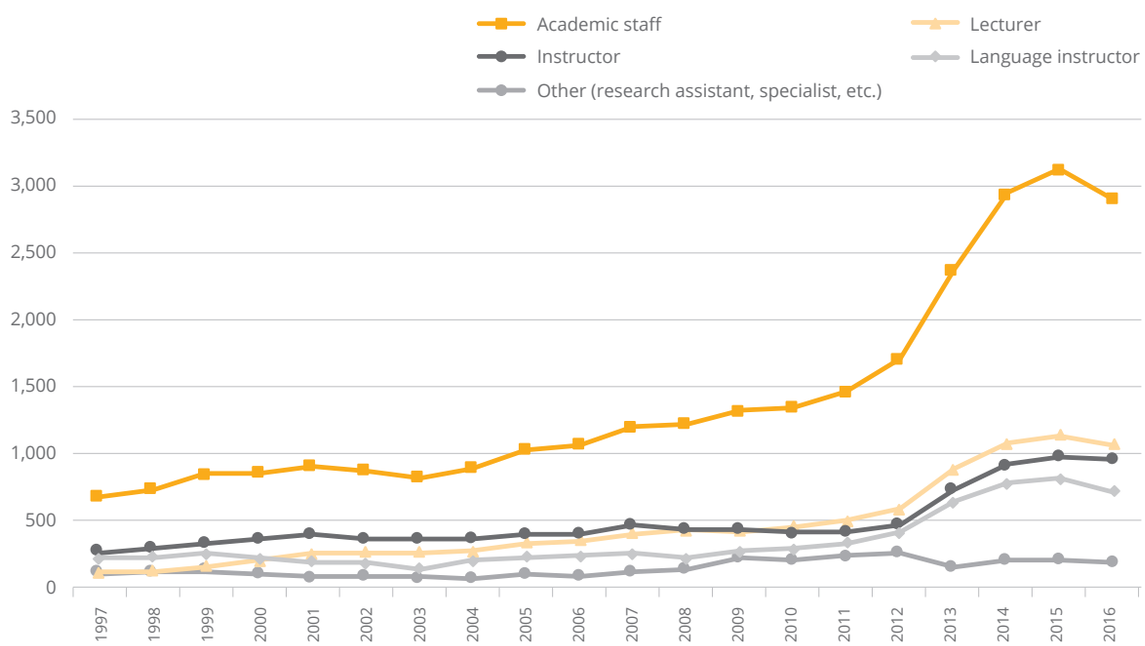
NUMBER OF INTERNATIONAL ACADEMIC STAFF

This indicator discusses the distribution of international academic staff according to institution type, title and gender. The term "international academic staff" is used in a more inclusive and wide manner in the international literature when compared to "foreign faculty". Those who are defined as foreign in the official statistics in Turkey are considered international academic staff in this study.

Figure D.2.1 shows the trends in the number of international academic staff employed at higher education institutions according to title in the period of 1997-2016. While the total number of international academic staff was 669, a significant increase across all titles took place and this number reached 2,886 in 2016. 1057 of these are faculty, 942 are instructors, 709 are language instructors, and 178 of them are other academic staff. The largest portions of international academic staff in Turkey are instructors and language instructors.

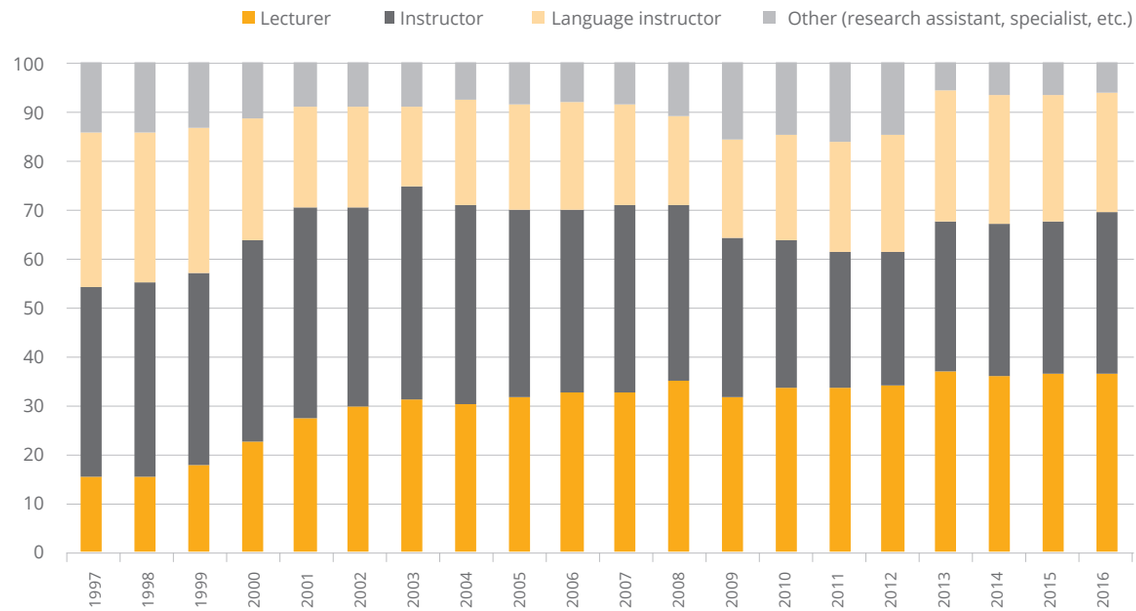
Figure D.2.2 shows the trends in the proportional distribution of international faculty employed at higher education institutions according to academic title in the period of

Figure D.2.1 Trends in the number of international academic staff employed at higher education institutions according to title (1997-2016)



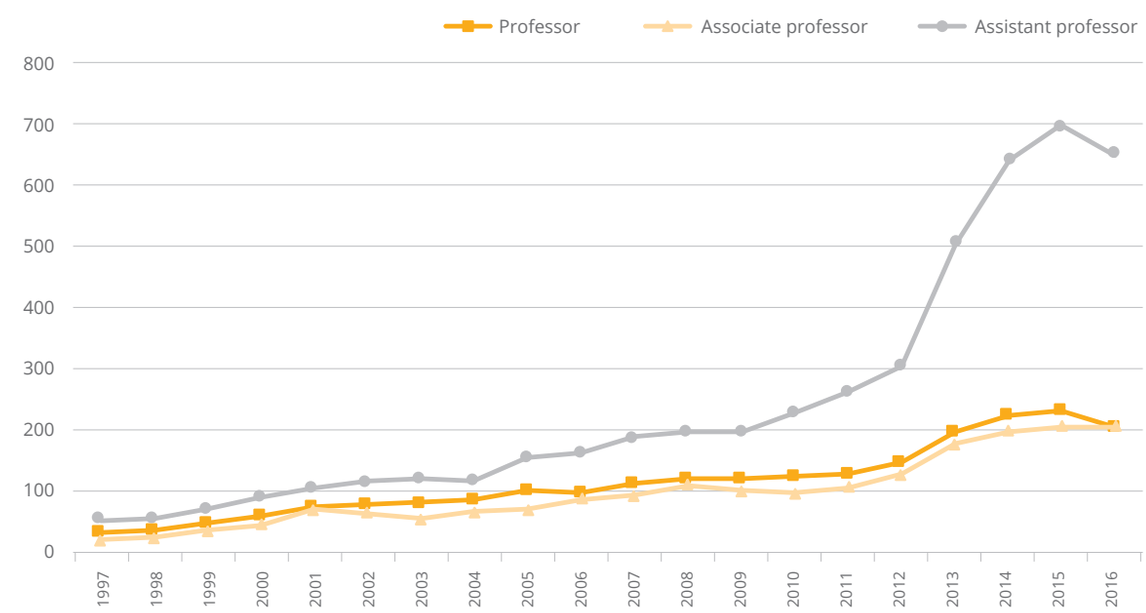
Source: Compiled using Higher Education Information Management System and ÖSYM's data.

Figure D.2.2 Trends in the proportional distribution of international academic staff employed at higher education institutions according to academic title (%) (1997-2016)



Source: Compiled using Higher Education Information Management System and ÖSYM's data.

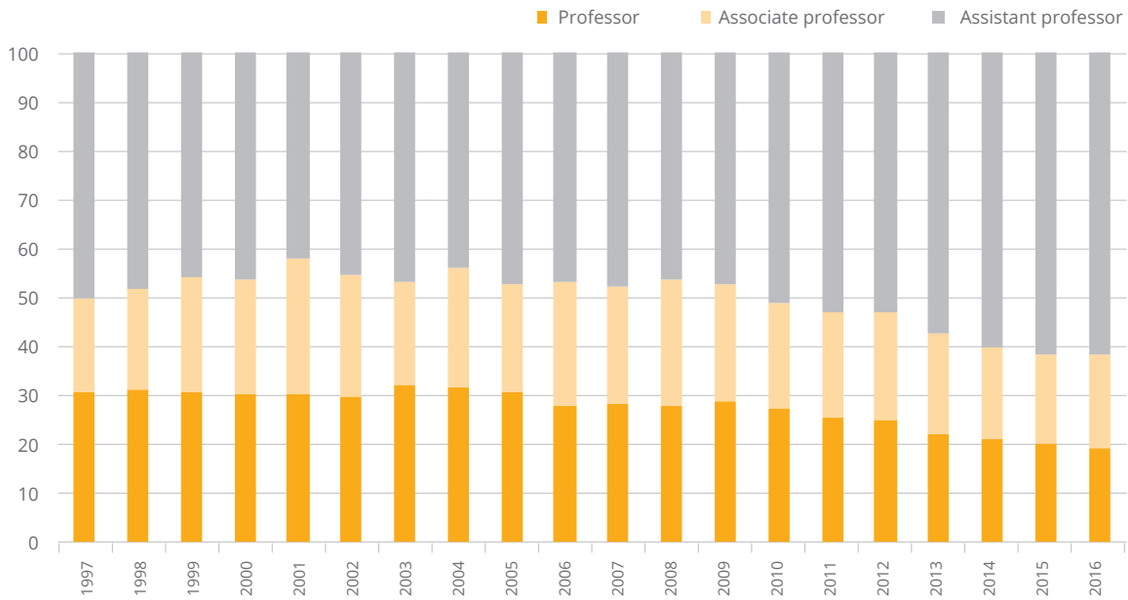
Figure D.2.3 Trends in the number of international faculty members employed at higher education institutions according to academic title (1997-2016)



Source: Compiled using Higher Education Information Management System and ÖSYM's data.

1997-2016. In this period the share of international faculty increased from 16% to 37% and the share of instructors declined from 39% to 33% and language instructors from 32% to 25%. The increase in the ratio of international faculty with doctorates is a positive development for the quality of Turkish universities. However, it should be noted that as

Figure D.2.4 Trends in the proportional distribution of international faculty members employed at higher education institutions according to academic title (%) (1997-2016)



Source: Compiled using Higher Education Information Management System and ÖSYM's data.

of the 2016-2017 academic year the total number of international faculty members is 1050 which is considerably low (see Figure D.2.2).

Figure D.2.3 shows the trends in the number of international faculty members employed at higher education institutions according to academic title in the period of 1997-2016 while Figure D.2.4 shows the trends in the proportional distribution. While the number of international faculty in Turkey was 100 in 1997, this number increased to around 1,050 in 2016. In terms of proportion, 19% of international faculty are professors, 19% are associate professors and 61% are assistant professors. The number of professors declined over time and the ratio of assistant professors increased.

Table D.2.5 Number of international academic staff according to origin and academic title (2016)

Country	Lecturer, instructor, and others	Faculty	Total
US	283	81	364
Syria	213	121	334
Azerbaijan	101	156	257
UK	167	42	209
Iran	133	68	201
Cyprus	55	46	101
Germany	46	46	92
Greece	44	33	77
Egypt	51	24	75
Canada	53	21	74
Other	683	419	1,102
Total	1,829	1,057	2,886

Source: Compiled using Higher Education Information Management System data.

Table D.2.5 shows the number of international academic staff employed at Turkish higher education institutions in the 2016-2017 academic year. The countries that international faculty members originate from the most are; the US, Syria, Azerbaijan, the UK, and Iran. The countries that international faculty have come from the most are Azerbaijan, Syria and the US. The reason that the number of ancillary staff, instructors and language instructors from the US and UK is relatively high is that foreign language education is primarily English in Turkey. The reason that the number of faculty from Azerbaijan, Syria and Iran is relatively high is linked to linguistic, cultural and geographical proximity. Table D.2.6 shows the top 20 universities that have the

Table D.2.6 Top 20 universities that have the most i nternational faculty in Turkey, institution type, and the number of international faculty (2016)

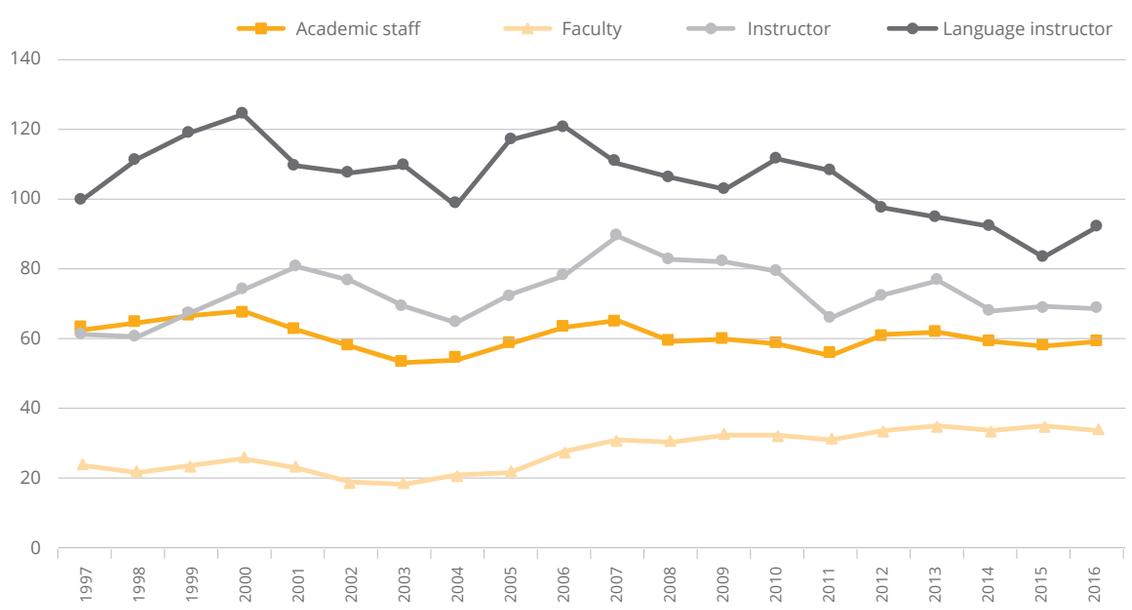
University	Type	Faculty
İ.D. Bilkent University	Foundation	81
METU	Public	53
Boğaziçi University	Public	43
Mardin Artuklu University	Public	30
Koç University	Foundation	26
Gaziantep University	Public	25
Erciyes University	Public	23
İstanbul University	Public	21
İstanbul Aydın University	Foundation	21
Yeditepe University	Foundation	20
Kastamonu University	Public	19
İTÜ	Public	17
Uluslararası Antalya University	Foundation	17
Çanakkale Onsekiz Mart University	Public	16
Fatih Sultan Mehmet Vakıf University	Foundation	16
KafkasUniversity	Public	15
Bülent Ecevit University	Public	15
İstanbul Sabahattin Zaim University	Foundation	15
Ardahan University	Public	14
Avrasya University	Foundation	14

Source: Compiled using Higher Education Information Management System data.

most international academic staff in Turkey, the institution type, and the number of international faculty. Half of these international academic staff are employed at foundation universities while the others are employed at public universities. Most of the foundation universities are in the most developed provinces of Turkey in terms of higher education such as İstanbul and Ankara. **The top 5 universities which have the most international faculty are: İ.D Bilkent, METU, Boğaziçi, Mardin Artuklu and Koç Universities.**

Figure D.2.7 shows the trends in the gender ratio of international academic staff employed at higher education institutions according to academic title in the period of 1997-2016. It can be observed that there has been a change in the gender ratios of international academic staff over time. In the period of 1997-2016 the gender ratio of international faculty has changed and has fallen from 61 to 59; this ratio has increased from 61 to 69 for instructors and from 24 to 34 for faculty. There has been significant fluctuation for international language instructors and while the gender ratio was 100 in 1997, it was 92 in 2016.

Figure D.2.7 Trends in the gender ratio of international academic staff employed at higher education institutions according to academic title (1997-2016)



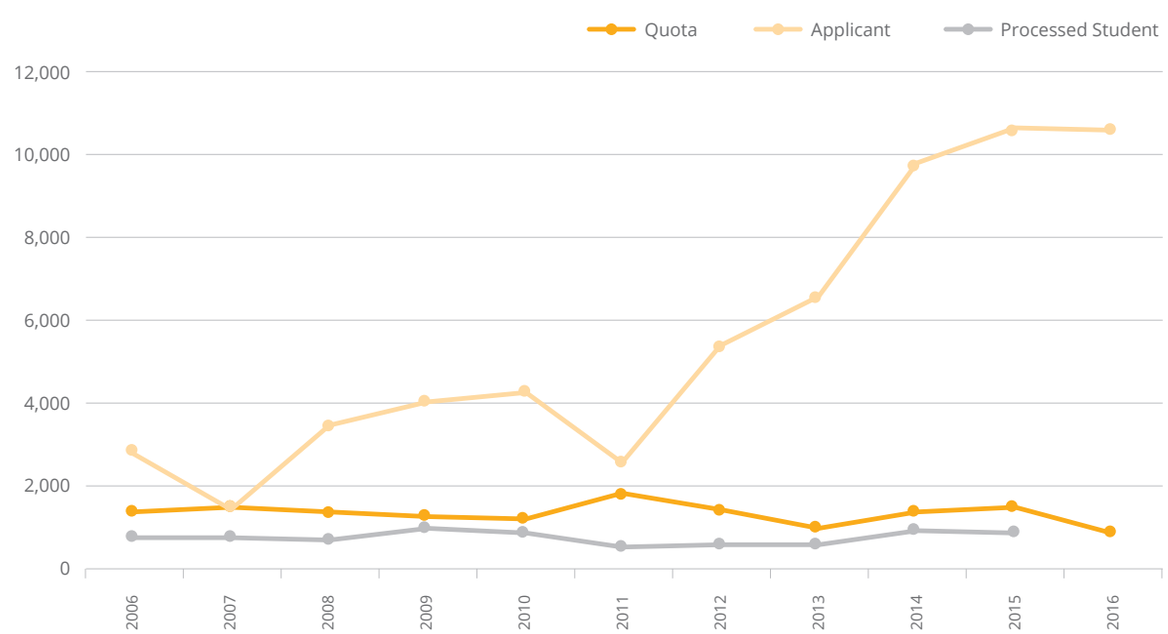
Source: Compiled using Higher Education Information Management System and ÖSYM's data.

INDICATOR D3 MINISTRY OF NATIONAL EDUCATION (MONE) SCHOLARSHIPS FOR GRADUATE STUDY ABROAD

As it has been indicated in previous chapters there is a significant undersupply of faculty with doctorates in Turkey (see **Chapter C: Education Outputs**). The need for faculty with doctorates has become even more pronounced due to the establishment of new universities and the expansion of the higher education system (Çetinsaya, 2014). This requires attention towards the issue of training faculty. Various programs such as the Program for Training Faculty (Öğretim Üyesi Yetiştirme Programı) which was directed particularly at developing universities were implemented for this purpose. In addition, in the context of the 1929 Law No.1416: Students to be Sent to Foreign Countries (Ecnebi Memleketlere Gönderilecek Talebe Hakkında Kanun), students are being sent abroad by the Ministry of National Education (MONE) in order meet the universities' need for faculty. In this section, the data concerning the program Selecting and Placing Candidates to be Sent Abroad for Graduate Study (Yurtdışına Lisansüstü Öğrenim Görmek Üzere Gönderilecek Adayları Seçme Yerleştirme, YLSY) is presented.

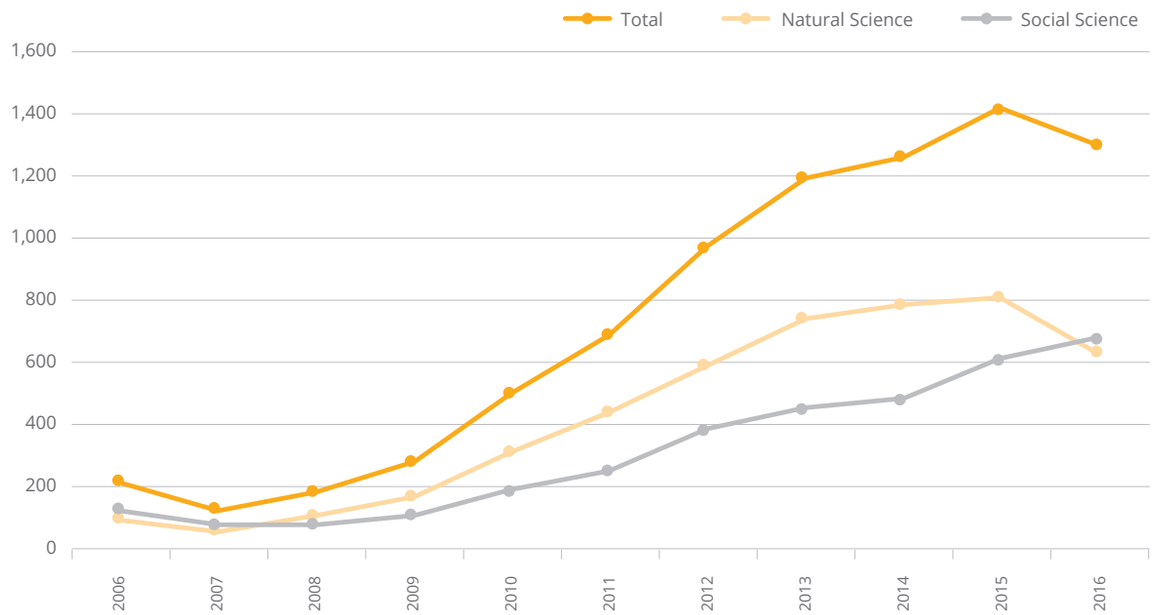
Figure D.3.1 presents the trends in the number of students who applied for the scholarship and were processed as well as the quotas of YLSY in the period of 2006-2016. Due to the need for academics arising from the establishment of new universities and in the context of Law No.1416 (Students to be Sent to Foreign Countries), "5,000 students in 5 years Project" was initiated. The plan was to send 1000 thousand students abroad every year (MONE, 2016). The quotas for YLSY fluctuated over the years (due to quotas not filling up entirely). In some years it increased up to 1,800 while in 2016 it fell to 900. Nevertheless, there has been a significant increase in the number of applicants in 2006-2016 period and it went from 2,830 to 10,593. How-

Figure D.3.1 Trends in the number of quotas, applicants, and processed students for YLSY (2006-2016)



Source: Compiled using MONE data.

Figure D.3.2 Trends in the number of MONE doctorate scholars abroad according to study fields (2006-2016)



Source: Compiled using MONE data.

ever, **due to some quotas not being filled and due to some students, who did not open a file despite being placed, the quotas could not be fully utilized in any given year.** 771 individuals applied for the 1,392 spots in 2016, 536 applied for the 1,837 spots in 2011 and 908 applied for the 1,500 spots in 2015. Data for 2016 is not available since the placements are ongoing for 2016.

Figure D.3.2 shows the trends in the number of MONE doctorate scholars abroad according to study fields in the period of 2006-2016. While there were 209 doctoral MONE scholars, i121 of whom were in the social science and 88 of whom were in the natural sciences in 2006, there has been an increase in the number of doctoral MONE scholars since 2008. As of 2016, there are 1.301 doctoral MONE scholars 624 of whom are in the natural sciences and 677 in the social science.

Table D.3.3 shows the number of MONE scholars according to the country they reside in, educational level and ed-

Table D.3.3 Number of MONE scholars according to the country they reside in, educational level and education field (2016)

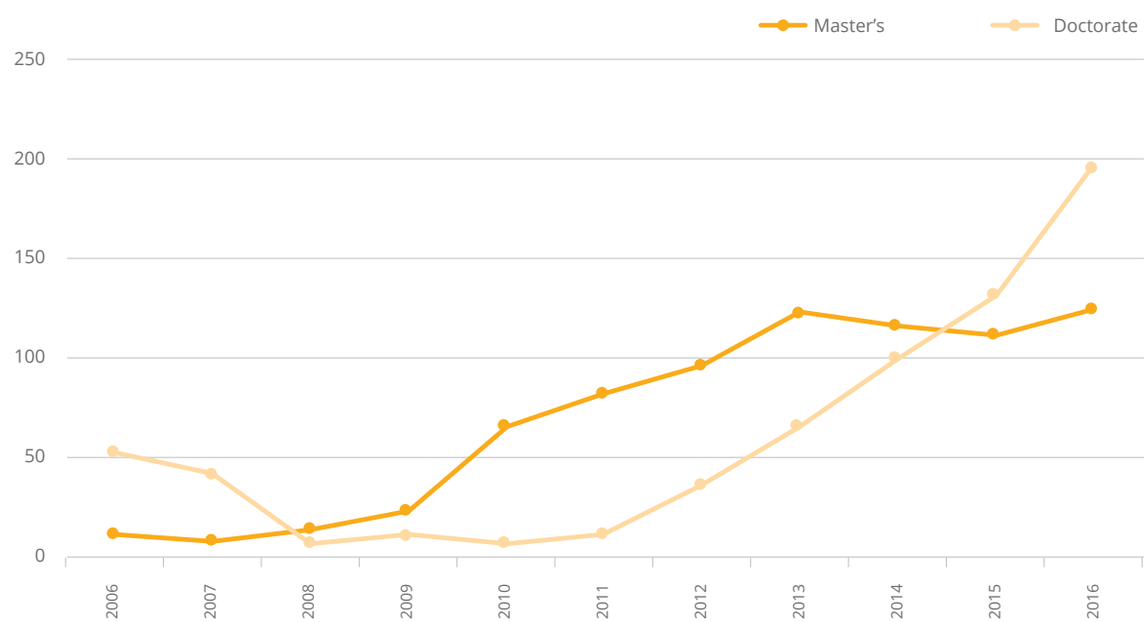
	Master's			Doctorate			Total		
	Natural Sciences	Social Science	Total	Natural Sciences	Social Science	Total	Natural Sciences	Social Science	Total
US	352	158	510	396	268	664	748	426	1,174
England	206	281	487	172	294	466	378	575	953
Germany	32	30	62	19	39	58	51	69	120
Other countries	27	97	124	37	76	113	64	173	237
Total	617	566	1,183	624	677	1,301	1,241	1,243	2,484

Source: Compiled using MONE data.

ucation field. **85% of master's MONE scholars and 83% of doctoral MONE scholars are being educated in the U.S and the U.K.** The fact that these countries have long-standing prestigious higher education programs, that many universities in these two countries are placed at the top of rankings and that the language of instruction is English increases the attractiveness of these two countries.

Figure D.3.4 shows the trends in the number of individuals who completed their education abroad and subsequently requested appointment and began their mandatory service in Turkey according to education level between 2006 and 2016. According to the figure, 11 individuals who completed their master's degree and 52 individuals who completed their doctorate returned to Turkey. The number of individuals who returned to Turkey and began their mandatory service has increased over time and in 2016, 124 master's graduates and 196 doctoral graduates returned to Turkey. Moreover, in the period of 2006-2016, close to 800 individuals completed their master's degree and returned to Turkey while 800 doctoral graduates also returned. These numbers are quite far off from the goal of 5000 students in 5 years and thus the 5000 new faculty desired. In other words, in addition to quotas not being filled, a significant portion of students did not complete their doctorates (BHE, 2007; Çetinsaya, 2014).

Figure D.3.4 The number of individuals who completed their education abroad and requested appointment and began their mandatory service by level of education (2006-2016)



Source: Compiled using MONE data.

CHAPTER D

HIGHLIGHTS

The number of academic staff and faculty in Turkey has increased significantly in recent years. Newly established public universities in particular have employed a large number of research assistants and assistant professors. Foundation universities have strengthened their academic personel by employing more professors, assistant professors in particular. The share of language instructors, instructors and adjunct academic staff have dropped at foundation universities. However, the task of training scholars at the doctoral level has been primarily carried out by public universities. **The fact that although the employment of academic staff is increasing, the number of students is increasing more rapidly is one of the primary issues related to the employment of academic staff at universities.** On the other hand, it can be said that the increase in universities alongside the increase in academic staff with doctorates will naturally generate competition between universities who aim to employ high quality academic staff. Furthermore, the issues of concentration of faculty in specific regions in Turkey and training quality faculty have yet to be resolved.

The number of academic staff in Turkey has constantly increased in the 1983-2016 period. As of 2016 the total number of academic staff in Turkey has surpassed 150 thousand (Figure D.1.1). The number of faculty has doubled in the last ten years alone. The demand for academic staff from newly established universities from 2006 onwards has been the driving force behind this increase. As the number of universities and students increased in Turkey, the government has allocated a large number of positions for universities to meet their need for academic staff.

The vast majority of academic staff in Turkey are employed at foundation universities. As of 2016, 86% of the total faculty are employed at public universities while 14% are employed in foundation universities (Figure D.1.2). On the other hand, **foundation universities are increasing their share of faculty employment every year.** The fact that the number of academic staff with doctorates is increasing at foundation universities indicates that these institutions are going through an important transformation and that working at these institutions which are mostly located in metropolitan areas is becoming more attractive for faculty.

The largest group within faculty at public universities is associate professors (see Figure D.1.5). This group is also the fastest growing among faculty. The rate of increase for associate professors and professors are almost parallel. It is understandable that the number of associate professors is lower than assistant professors since the title of associate professorship is granted by the Interuniversity Board of Turkey (Üniversitelerarası Kurul) according to certain criteria. However, **this finding also indicates that a significant portion of assistant professors do not receive the title of associate professor.**

The ratio of female academic staff in Turkish universities is increasing every year (see Figure D.1.13). The number of female academic staff has increased both at public and foundation universities in the period of 1983-2016. Therefore, there has been a decline in the ratio of male academic staff em-

ployment. As of 2016, the share of female academic staff in Turkey is 43% and the OECD average is 43% (OECD, 2016). Therefore, it can be observed that Turkey has caught up with the OECD average.

Although female employment levels at universities have increased in recent years, female faculty ratios decline as the title gets higher (see Figure D.1.14). This is an indicator that female academics in Turkey are having problems in continuing their careers. The groups having the highest number of female academic staff are research assistants and assistant professors. **All these findings show that women encounter relatively less obstacles when becoming an academic. However, it is also the case that they face more obstacles when trying to advance in their careers.**

The number of international faculty in Turkey has been constantly increasing and the rate of this increase has picked up pace since 2012. While there were 107 thousand international faculty members in Turkey in 1997, this increased to 1057 and the number of academic staff increased from 669 to 2.886 (see Figure D.2.1). The total number of international academic staff and faculty represents a very small portion of the total academic staff and faculty (see Figure D.2.3). **The share of international academic staff in Turkey is 1.9% based on the data from 2016-2017 academic year.** This ratio is inadequate at a time in which internationalization has become increasingly important and perceived as directly related to the performance of universities (Çetinsaya, 2014). Moreover, the ratio of international academic staff with doctorates has become an important variable in the determination of various university rankings (see **Indicator G.3. National and International University Rankings**). The low number of international academic staff is negatively impacting the international rankings of Turkish universities.

A significant portion of the students who were sent abroad for their graduate education become liable because they either did not successfully complete their education or did not begin their mandatory service. Although the MONE scholarships for graduate study abroad has played an important role in meeting the faculty demand of universities, the number of graduated scholars that requested an appointment and began their mandatory service has been lower than anticipated (see Figure D.3.4). Due to problems with Law No.1416: Students to be Sent to Foreign Countries and students finding academic life unattractive, students are discouraged to participate in this program to go abroad (Çetinsaya, 2014). In order to increase the number of applicants for this program and make the program more attractive, MONE enacted a change in the Regulation of Turkish Students Studying in Foreign Countries. In addition to this, a legislative change was enacted in 2014 to count the period in which students with scholarships study abroad under law no. 1416 as civil service.

RECOMMENDATIONS

- Since access to higher education will increase in the coming years, it is imperative to strengthen the academic staff of universities. Considering that the most important way to meet the demand for faculty is to increase the number of doctoral graduates, **Turkey must increase its annual doctoral graduate rate from 5-6 thousand to 15-20 thousand.** In this context, it is important to strengthen doctoral programs, both in terms of quality and quantity. Foundation universities should also be incentivized to train faculty and share this burden with public universities in a fair way.
- The problems that female academics face while advancing in their careers should be examined extensively. The relatively positive environment for women to begin their academic careers in should be reinforced by policies and mechanisms that support women after they start their academic career.
- Comprehensive policies to make Turkey more attractive for international academic staff from different countries should be developed further.
- **The steps taken by MONE in order to make the scholarships for graduate study abroad a part of the Law No.1416 framework more attractive should be supported and continued.** In this context, the nature of academic work in the 21st century should be taken into account and the length and place of the mandatory service to be undertaken upon graduation should be made more flexible. Moreover, efforts to expand the number of countries that scholars are sent to for graduate education should be continued.

CHAPTER D

REFERENCES

BHE. [YÖK] (2007). *Türkiye'nin yükseköğretim stratejisi* [Turkey's higher education strategy]. Ankara: T. C. Yükseköğretim Kurulu.

Çetinsaya, G. (2014). *Büyüme, kalite, uluslararasılaşma: Türkiye yükseköğretimi için bir yol haritası* [Growth, quality, internationalisation: A road map for Turkish higher education] Eskişehir: Yükseköğretim Kurulu Başkanlığı.

Doğramacı, İ. (2007). *Türkiye'de ve dünyada yükseköğretim yönetimi* [Higher education management in Turkey and around the world]. Ankara: Meteksan.

Küçükcan, T. & Gür, B.S. (2009). *Türkiye'de yükseköğretim: Karşılaştırmalı bir analiz* [Higher education in Turkey: A comparative analysis]. Ankara: Siyaset, Ekonomi ve Toplum Araştırmaları Vakfı.

MONE. (2016). *Milli Eğitim Bakanlığı yurt dışı lisansüstü öğrenim bursu programı* [Ministry of National Education scholarship for graduate education abroad]. Ankara: Milli Eğitim Bakanlığı. http://yyegm.meb.gov.tr/meb_iys_dosyalar/2016_10/21031209_ylsy_tanitim_kitapcigi.pdf

OECD. (2016). *Education at a glance 2016: OECD indicators.* Paris: Organisation for Economic Co-operation and Development.

Özer, M. (2011). Türkiye'de yükseköğretimde büyüme ve öğretim üyesi arzı [Higher education growth in Turkey and supply of academics]. *Yükseköğretim ve Bilim Dergisi*, 1(1), 23-26.

Tekeli, İ. (2010). *Tarihsel bağlamı içinde Türkiye'de yükseköğretimin ve YÖK'ün tarihi* [History of BHE and higher education in Turkey in its historical context]. İstanbul: Tarih Vakfı Yurt Yayınları.

CHAPTER E

EDUCATIONAL ENVIRONMENTS

This chapter provides indicators about educational environments of higher education institutions and their units in Turkey. In this respect, firstly the number of universities and their units are assessed; then, the number of students per faculty and academic staff are analyzed. Following these indicators, physical aspects of educational environment and the subject of green campuses are discussed. Lastly, various data on lodging opportunities provided to higher education students are examined.

INDICATOR E1

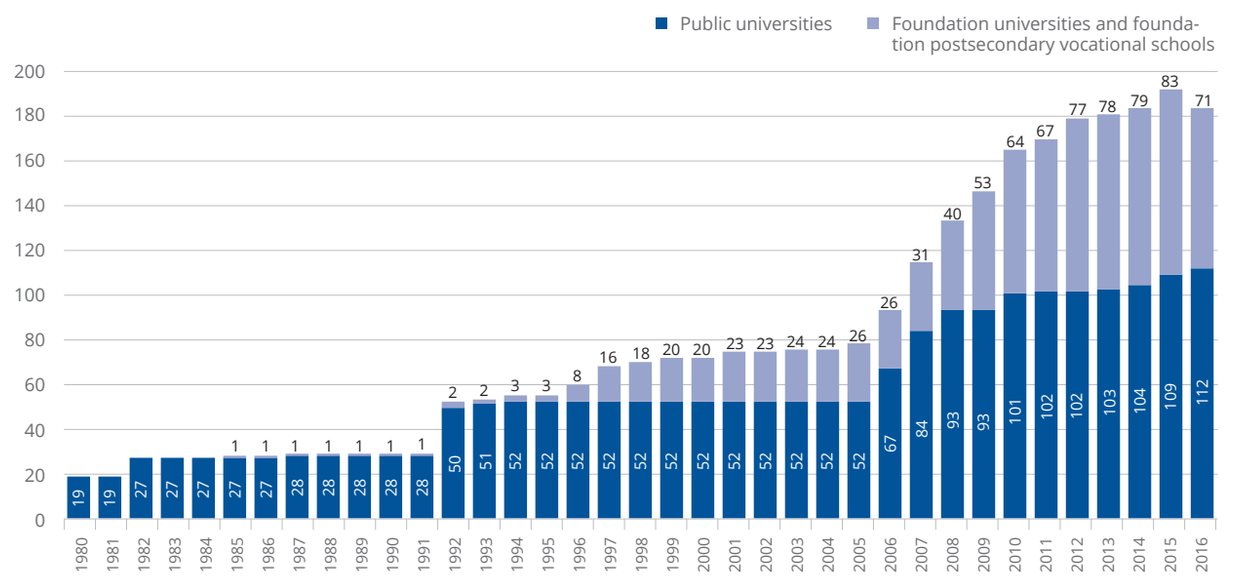
NUMBER OF UNIVERSITIES and THEIR UNITS

Changes in the number of universities and their units such as faculties, institutes, research centers, departments and programs over the years will be analysed in this part.

Trends in the number of universities between the years 1980-2016 are shown in Figure E.1.1. In 1980, Turkey had 19 universities. With the formation of BHE in 1982, 8 new public universities were founded in order to balance supply and demand in higher education. In 1985, on the other hand, the first foundation university İhsan Doğramacı Bilkent University was founded. Another public university was founded in the late 1980s, their number reaching 29 by 1992. In the 1990s, only one in every five people had access to higher education (Çetinsaya, 2014). Therefore, 29 universities were not able to satisfy the demands of the young populace.

In order to eliminate the disparity between supply and demand, a total of 23 universities, 22 public and 1 foundation university, were founded in 1992. After the foundation of two public universities in 1993 and 1994, no new public universities were founded until 2006. During this process, 21 new foundation universities and foundation postsecondary vocational schools were established. These new universities established in the 1990s were not able to achieve the balance between supply and demand, as the demand for higher education continued to increase significantly in the next years. The swift increase especially in the secondary education schooling rate, the number of graduates and graduation rates along with the interest in higher education caused the number of higher education applicants to reach 1.9 million in 2000s. Only one third of applicants were admitted to universities in these years (Çetinsaya, 2014). In 2006, the number of universities reached 77 (Figure E.1.1). As a result of the demand for higher education, from 2006 onwards policies aiming to found new universities while expanding the existing ones were implemented. The Justice and Development Party (AK Party) government of the time founded 41 public universities between 2006-2008 as a part of the "at least one universities

Figure E.1.1 Trends in the number of universities (1980-2016)



Source: Compiled using Higher Education Information Management System data.

per city" policy. Furthermore, 9 foundation universities and 1 foundation postsecondary vocational school was established during this period. These three years have arguably marked the fastest growth in Turkey's higher education system. A similar growth also occurred in the years 2009 and 2010; however, establishment of foundation universities and foundation postsecondary vocational schools were prioritized. From 2011 onwards, the process of founding new universities slowed down. 11 public and 19 foundation universities along with 2 foundation postsecondary vocational schools were established between 2011-2016. Comparing the number of public universities founded during the time in office of two presidents of BHE within this time period, it can be seen that although 21 foundation universities were formed during Kemal Gürüz's time in office no new public universities were established. During Yusuf Ziya Özcan's BHE presidency, however, 18 public and 32 foundation universities were formed. The fastest rate of increase in the number of universities in Turkey was achieved during Recep Tayyip Erdoğan's prime ministry and Yusuf Ziya Özcan's BHE presidency (Günay and Günay, 2011; Gür and Çelik, 2011). The main aims of the higher education system's expansion are to assure interregional equality, achieve economic, social and cultural stimulation in disadvantaged regions, to support economic development and to satisfy the demands of the people (Karataş, Acer and Güçlü, 2017).

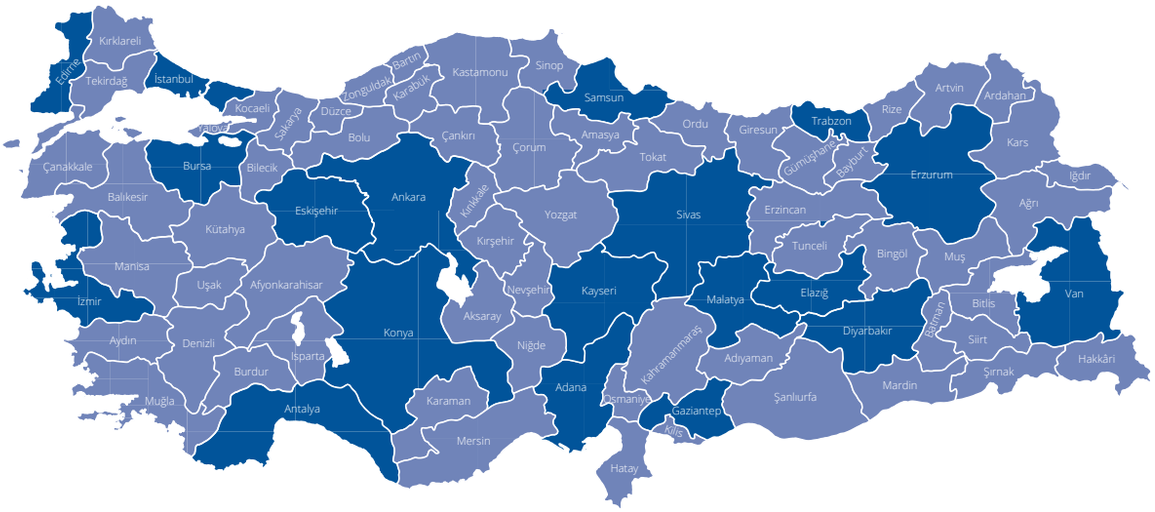
Another important factor which affected the number of universities in Turkey is the closure of 15 foundation universities affiliated with FETÖ. These universities were closed down after the July 15 coup attempt with Statutory Decree No. 667 during the state of emergency. With the law passed in September 2016, İzmir Democracy and İzmir Bakırçay universities were formed to replace the two foundation universities that were closed down. Facilities and students of the closed foundation universities were subsumed under various public universities. As a result of these developments, Turkey currently has 112 public universities and 71 foundation universities and foundation postsecondary vocational schools in 2017. Even though the higher education system has achieved an approximate growth of 150% since 2006, the demand for higher education is still expected to rise in the following years (see **Chapter A: Transition to Higher Education**).

Stages of opening universities in Turkey are displayed in Map E.1.2. As it can be observed from the map, there are three prominent stages. **Defined as the first wave of opening new universities, the first map shows the distribution of 30 new universities founded in 19 cities, up until 1992.** 1 city in the Aegean region, 2 cities each in the Black Sea, South-eastern Anatolia and Mediterranean regions, 3 cities in Marmara, 4 cities in Eastern Anatolia and 5 cities in Central Anatolia have universities. 8 of these public universities were founded in 1982, 1 foundation university in 1985 and 1 public university in 1987. The remaining universities were established before this time. 3 of the said 8 public universities were founded in İstanbul, while the remainder were formed in various cities across Turkey. As a result, universities were spread to a certain extent in various cities. In 1992, 57 cities out of 76 still remained without a university.

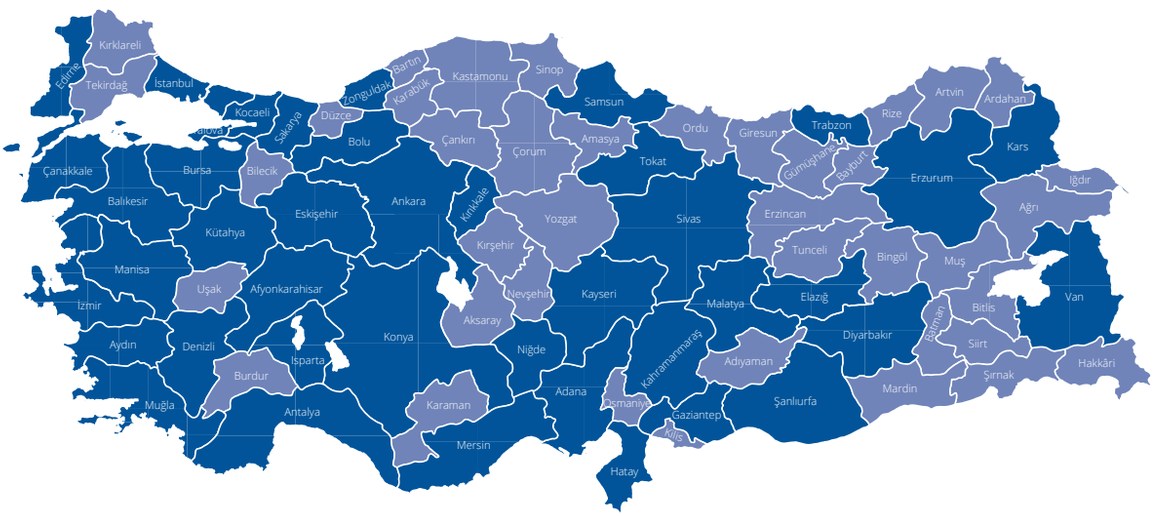
The second wave of opening of new universities occurred with the formation of 22 public universities and 1 foundation university in various cities in 1992. 1 foundation university was established in İstanbul, while 21 cities observed the foundation of their first universities, including Kocaeli which enjoyed its two newly founded universities. Thus, the number of cities with universities increased to 40 and universities began to become more widespread. Looking at the map showing the second wave, it can be seen that universities were focused in cities that were relatively developed within the Marmara, Aegean, Mediterranean and Central Anatolia regions (Karataş, Acer and Güçlü, 2017).

The third wave of new university openings was realized between 2006 and 2008. The AK Party government at the time took the decision to found at least one university in every city in Turkey in order to massify higher education. **With 41 public and 10 foundation universities established between 2006-2008, all cities now had at least one university within their city limits.** Universities were founded especially in the least developed cities. These universities founded in the least developed cities between 2006-2008 experienced many issues and hardships, including the inability to find experienced administrative staff, unfilled quotas in certain departments and inadequate public funding to complete university's infrastructure (Özoğlu, Gür and Gümüş, 2016).

Map E.1.2 Stages of universitization in Turkey



1st wave (19 cities that have universities founded prior to 1992)

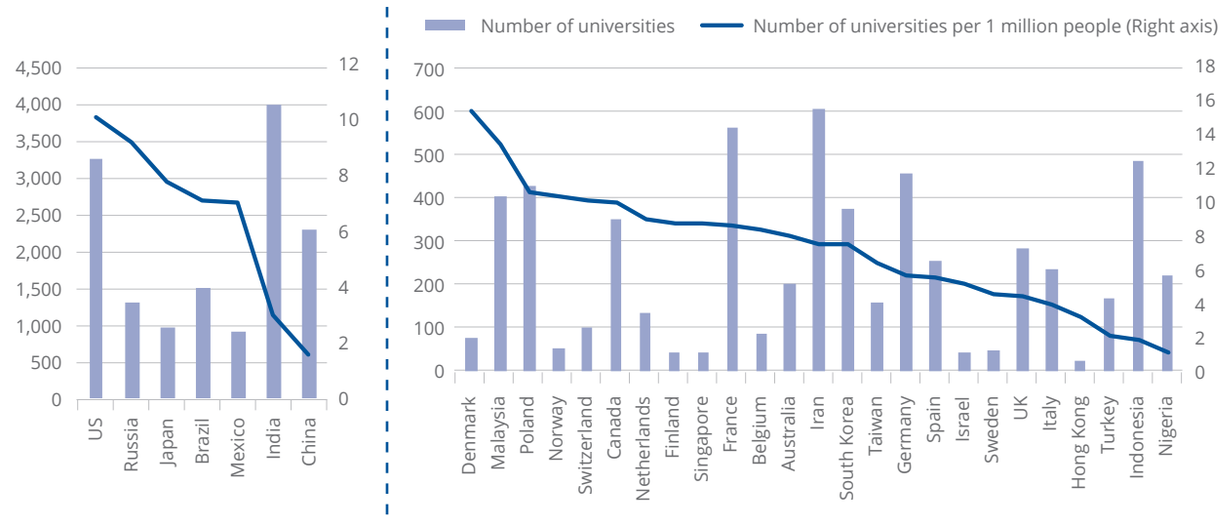


2nd wave (40 cities that have universities founded prior to 1992 and in 1992)

3rd wave (81 cities that have universities, including the ones founded between 2006-2008)

Source: Compiled using Higher Education Information Management System data.

Figure E.1.3 Number of universities in certain countries and the number of universities per million people (2016)



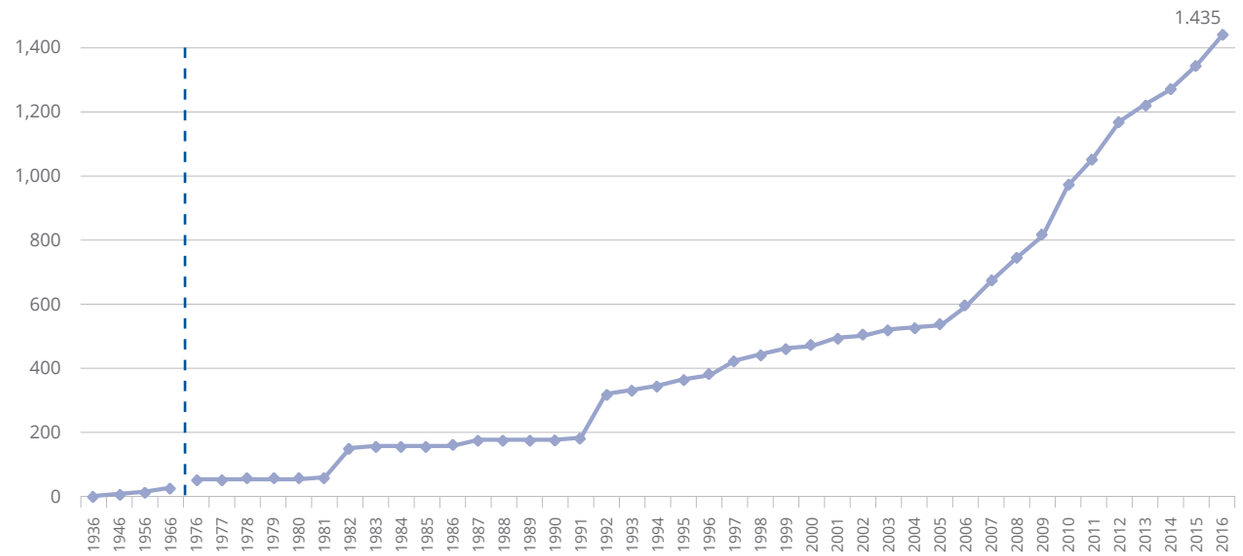
Source: Webometric (2017)

The distribution of universities in Turkey differs significantly according to city. For instance, there are 11 public and 42 foundation higher education institutions in İstanbul, 7 public and 10 foundation higher education institutions in Ankara and 6 public and 2 foundation higher education institutions in İzmir. Almost one third of universities are located in these three cities. Almost two thirds of all foundation universities are in İstanbul.

It is frequently discussed that in Turkey new universities lack quality and for this reason the founding of new universities is regarded negatively. It would be beneficial to compare international data on the number of universities various other countries and how many universities there are per 1 million people with Turkey's data. Even though detailed indicators such as the number of students and academic staff are included in reports published by institutions like OECD and UNESCO, there is no data on the number of universities in a given country. Webometric, which ranks universities worldwide, provides the number of universities (that exist in cyberspace). In Figure E.1.3, the number of universities in certain developed countries and the number of universities per 1 million people are shown. According to the data, India has the most universities in the world with 4,000. India is followed by the US (3,300), China (2,300), Brazil (1,500), Russia (1,300) and Japan (1,000). Mexico has 900 universities while France and Iran have around 600. Meanwhile, Indonesia, Germany, Poland and Malaysia have over 400 universities; Canada and South Korea have over 300 universities. Spain, Italy and the UK, on the other hand, have over 200 universities. The number of universities in all of these countries is higher than Turkey's. As it can be seen, certain countries have 10 times more universities than Turkey. Taking the number of universities per 1 million into consideration, Turkey ranks towards the bottom of the list with 2.1. Even though China, Nigeria and Indonesia have more universities than Turkey, their low rankings can be attributed to their high populations. On the other hand, there are more than 10 universities per 1 million people in the US, Russia, Denmark, Malaysia, Poland, Switzerland and Norway. **This data clearly indicates that the number of universities in Turkey is below the world average.**

Trends in the number of faculties between 1936-2016 are shown in Figure E.1.4. According to the graph, the number of faculties increased tremendously over time. 2 faculties in 1936 increased to 26 in 1966 and 53 in 1976. 5 faculties were founded between the years 1976-1981, increasing the total number of faculties to 58 in 1981. With the 30 new faculties founded between 1982 and 1991, 135 more faculties were opened in 1992, raising the number of faculties to 318 in 1992. Between 1992-2005, the number of faculties expe-

Figure E.1.4 Trends in the number of faculties (1936-2016)



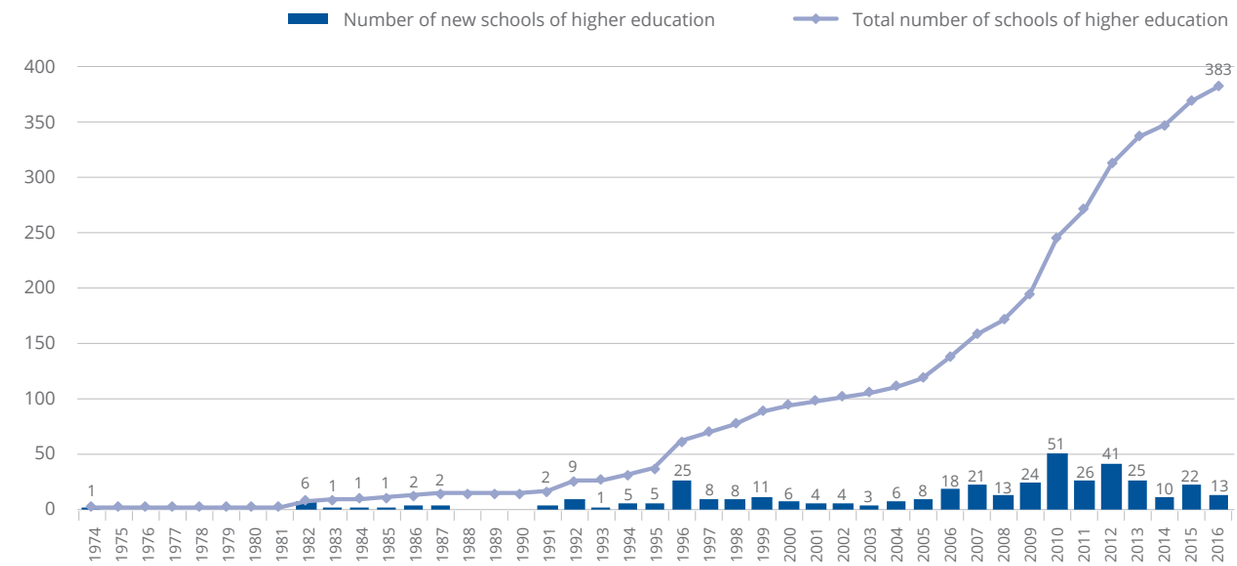
Source: Compiled using Higher Education Information Management System data.

rienced a steady increase and reached 500. A swift increase, as part of the higher education expansion policy, was observed from 2006 onwards and the number of faculties eventually reached 1,435 in 2016. In other words, between 2006-2016, the number of faculties almost tripled. This indicates that the higher education system is growing exponentially in terms of institutional structuring. On the other hand, it can be seen that almost all universities have similar faculties. For instance, almost all the public universities founded prior to 1982 have faculties of sciences and letters, engineering, medicine and education, while 94% of them also have faculties of economics and administrative sciences. On the other hand, 94% of the universities that were founded after 2006 have faculties of economics and administrative sciences, while 85% of them have faculties of theology and engineering. In this respect, **while faculties of science and letters were the priority before 1982, this priority shifted to applied social sciences like business management and economy after 2006. There is little diversification according to region, economy and employment among Turkey's universities, leading to the issue of uniformization** (Karataş, Acer and Güçlü, 2017).

Trends in the number of higher education schools (yüksekokul) founded of according to year and their total numbers between 1974-2016 are shown in Figure E.1.5. The number of higher education schools have continuously increased between the years 1974 and 2016. While there was only 1 school of higher education in Turkey at the beginning of this period, this has increased to 7 in 1982, to 25 in 1992 and eventually to 119 in 2005. With policies aiming to expand higher education, new schools of higher education were founded along with universities. As a result of these policies, the number of higher education schools increased exponentially, reaching 383 in 2016. **In other words, the number of higher education schools increased by 220% between the years 2006-2016.**

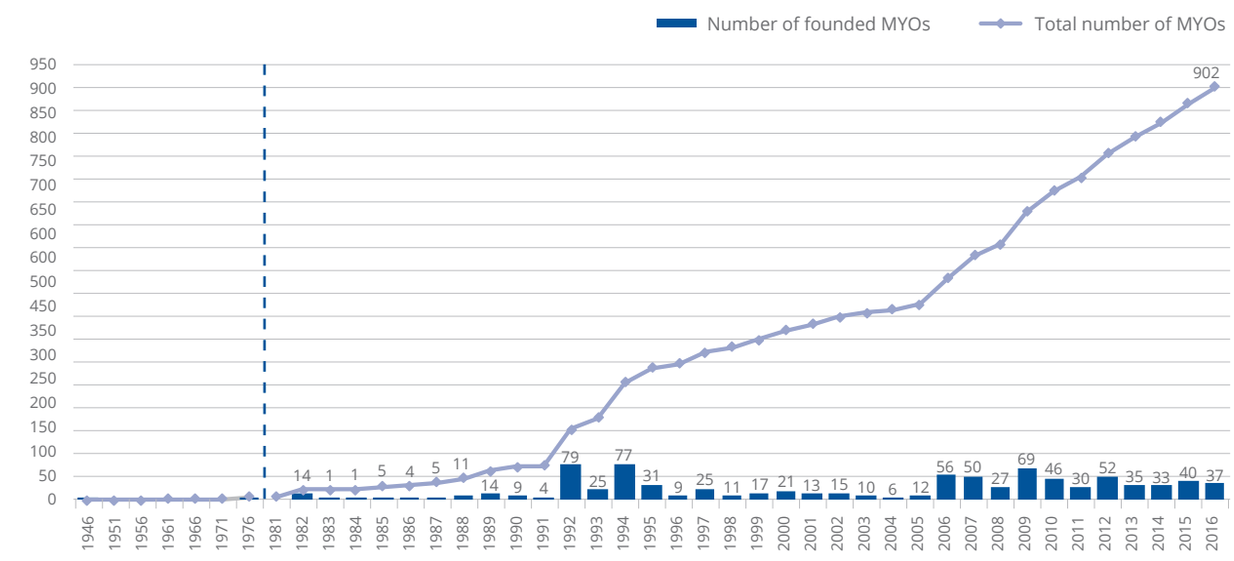
Trends in the number of postsecondary vocational schools (MYO) founded according to year and their total number between the years 1946-2016 are shown in Figure E.1.6. The first MYO in Turkey was founded in 1946, while the second was in 1957. By 1981, the number of MYOs reached 8. 14 new MYOs were formed in 1982, the total reaching 22. There was an incremental increase in the number of MYOs between the years 1982-1991, reaching 76. In 1992, 79 new MYOs were founded. Therefore, the number of MYOs were more than doubled, reaching 155. This was followed by an incremental increase in the number of MYOs; by 2005, there were 427 MYOs in Turkey. With higher education expansion policies from 2006 onwards, the number of MYOs grew exponentially. In 2016, the number of MYOs was 902.

Figure E.1.5 Trends in the number of higher education schools founded of by year and their total number (1974-2016)



Source: Compiled by using Higher Education Information Management System data.

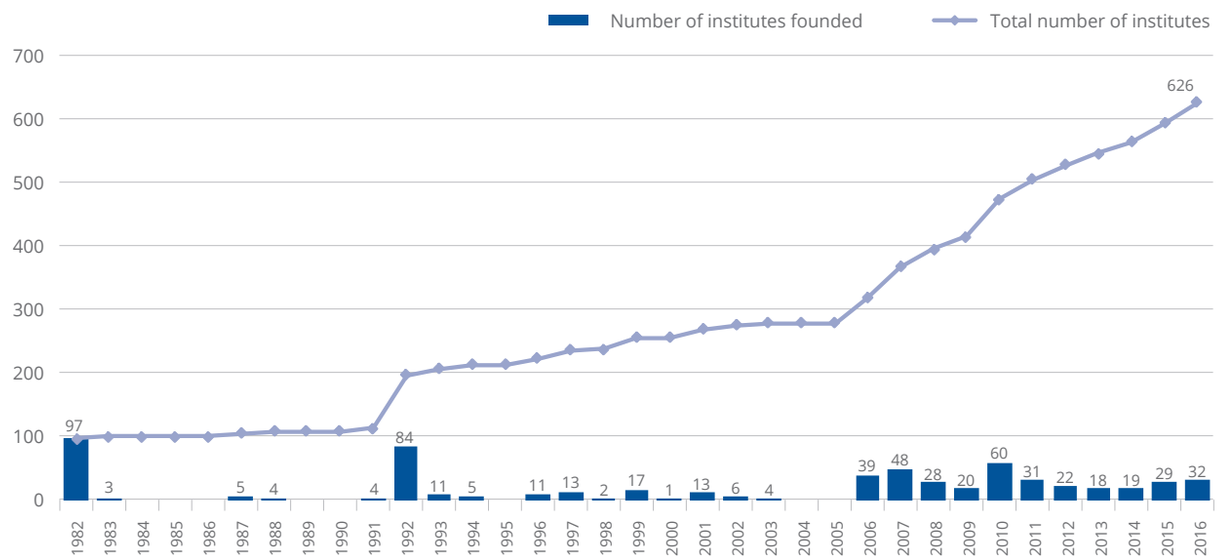
Figure E.1.6 Trends in the number of founded postsecondary vocational schools (MYO) by year and their total numbers (1946-2016)



Source: Compiled by using Higher Education Information Management System data.

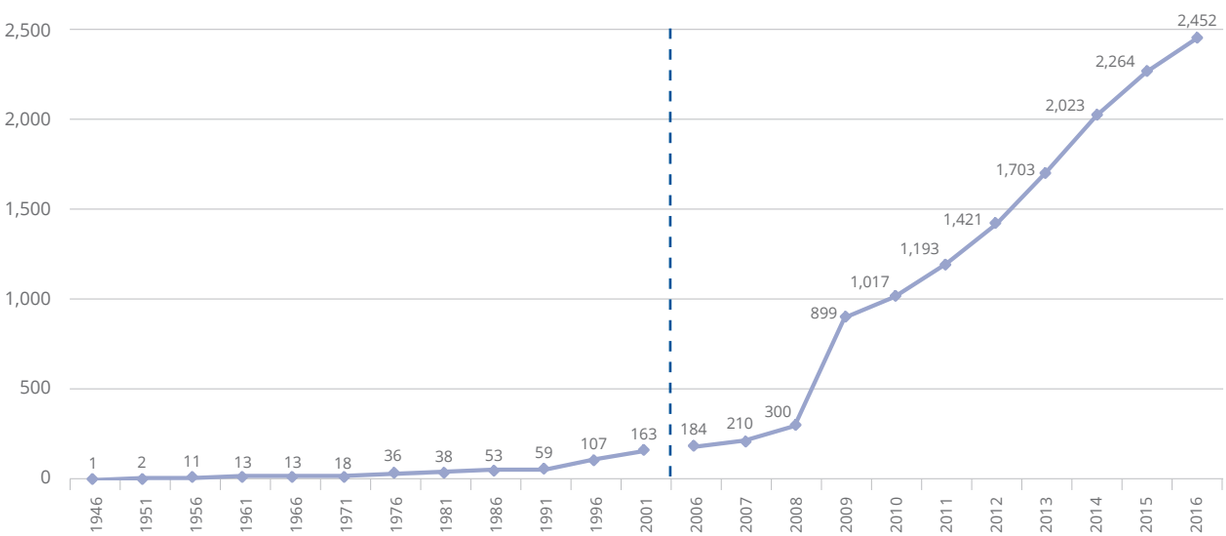
The number of institutes founded by year and their total numbers between the years 1982-2016 are shown in Figure E.1.7. 97 new institutes were founded in 1982. On the other hand, only 16 new institutes were founded between the years 1983-1991, reaching a total of 113 by 1991. With the foundation of 23 new universities in 1992, 84 institutes were formed and the total number of institutes increased to 197. The number of institutes continued to increase steadily until 2005, reaching a total of 280. **This number increased significantly between the years 2006-2016 and the total number of institutes increased to 626 in 2016.**

Figure E.1.7 Trends in the number of institutes founded by year and their total numbers (1982-2016)



Source: Compiled by using Higher Education Information Management System data.

Figure E.1.8 Trends in the number of research and application centers (AUM) by year (1946-2016)



Source: Compiled using Higher Education Information Management System data.

Trends in the number of research and application centres (AUM) between the years 1946-2016 are shown in Figure E.1.8. According to the data, the first AUM was founded in 1946. With a steady growth, the number of R&D Centres reached 38 by 1981. Meanwhile, between 1982 and 2007, the number of R&D Centres showed a gradual increase, reaching 210. **From 2007 onwards, the number of R&D Centers increased exponentially and showed a growth of more than 700% between the years 2008-2016. The total number of R&D Centres reached 2,452 in 2016.**

By February 2017, the top ten Turkish universities that had the most R&D Centres are shown in Table E.1.9. According to the data, Hacettepe University is leading with 105 R&D Centres. Hacettepe University is followed by Ankara (93),

Istanbul (76), Gazi (65), Sağlık Bilimleri (59), Dokuz Eylül (58), Akdeniz (56), Süleyman Demirel (50), METU (48) and Muğla Sıtkı Koçman (45) universities.

Taking the February 2017 data into consideration, the number of units according to the types of universities are shown in Table E.1.10. As of 2017, there are 112 public and 65 foundation universities along with 6 foundation MYOs, thus a total of 183 higher education institutions. There is a total of 1,627 faculties at these institutions. 1,224 of these faculties are at public universities, while the remaining 403 are at foundation universities. In addition, 369 out of 467 higher education schools are public, while the remaining 98 are foundation-owned. Meanwhile, 846 MYOs out of a total 947 MYOs are at public universities, while 95 are at foundation universities; on the other hand, 6 of them are at foundation MYOs. There are more than 17,203 departments in higher education institutions in Turkey. 14,483 of them are at public universities, while 2,619 are at foundation universities and 101 are at foundation MYOs. Moreover, 16,028 out of a total 25,837 programs are at public universities. The remaining programs are shared among foundation universities (9,201) and foundation MYOs (608). There are 27,706 majors in Turkey; 25,661 at public universities and 2,045 at private universities. 7,464 minors out of 8,046 are at public universities, while 582 are at foundation universities. Furthermore, there are 12,127 master's programs in Turkey; 10,018 are conducted by public universities and 2,019 are offered by foundation universities. Meanwhile, 4,832 doctorate programs are provided by public universities, while the remaining 421 are provided by foundation universities. Lastly, 118 out of a total 130 proficiency in art programs are at public universities, while 12 are at foundation universities.

Regarding the February 2017 data, the names of the top ten universities with the most departments and the number of their departments are shown in Table E.1.11. In descending order, these universities are Cumhuriyet University (325), Süleyman Demirel University (297), Selçuk University (285) and Atatürk University (273).

Table E.1.9 Top ten Turkish universities with the most research and application centers (AUM) (February 2017)

Name of the university	Number of R&D Centres
Hacettepe University	105
Ankara University	93
İstanbul University	76
Gazi University	65
Sağlık Bilimleri (Health Sciences) University	59
Dokuz Eylül Üniversitesi	58
Akdeniz University	56
Süleyman Demirel University	50
METU	48
Muğla Sıtkı Koçman University	45

Source: Compiled using Higher Education Information Management System data.

Table E.1.10 Number of units by type of universities (February 2017)

Type	Public	Foundation	Foundation MYO	Total
University	112	65	6	183
Faculty	1,224	403	0	1,627
School of higher education	369	98	0	467
MYO	846	95	6	947
Institute	478	196	0	674
Research and application centre (AUM)	2,362	495	6	2,863
Department	14,483	2,619	101	17,203
Program	16,028	9,201	608	25,837
Major	25,661	2,045	0	27,706
Minor	7,464	582	0	8,046
Master's program	10,018	2,109	0	12,127
Doctorate program	4,832	421	0	5,253
Proficiency in art program	118	12	0	130

Source: Compiled using Higher Education Information Management System data.

Table E.1.11 Names of the top ten universities with the most departments and the numbers of their departments (February 2017)

Name of the university	Department
Cumhuriyet University	325
Süleyman Demirel University	297
Selçuk University	285
Atatürk University	273
Çanakkale Onsekiz Mart University	242
Afyon Kocatepe University	232
Akdeniz University	217
Dumlupınar University	215
Uludağ University	211
Adnan Menderes University	210

Source: Compiled using Higher Education Information Management System data.

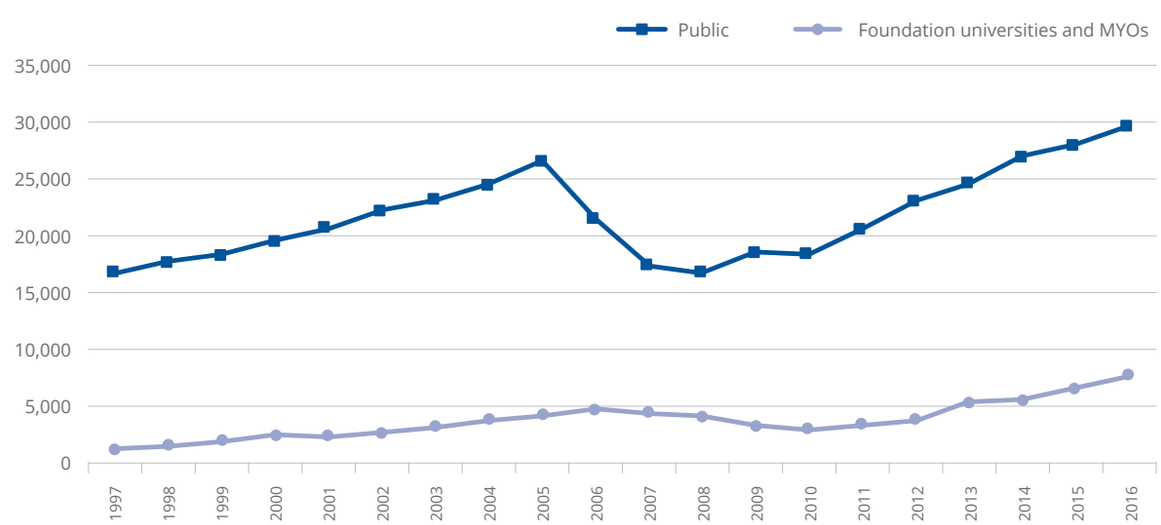
INDICATOR E2 NUMBER OF STUDENTS and ACADEMIC STAFF PER UNIVERSITY

In this section, data such as the numbers of students and academic staff per university are discussed. This data enables the assessment of the capacity of universities in Turkey.

Trends in the number of students per public and foundation university between the years 1997-2016 are shown in Figure E.2.1. Open education students were excluded from estimations. While the rate was 17,000 students per public university in 1997, this increased to 27,000 in 2005. This started to decrease between the years 2005-2008, dropping to 17,000 once again. However, between the years 2009-2016, this rate increased from 19,000 to 30,000 per public university. The number of students per foundation university has shown a fluctuating trend, increasing from 1,350 to 7,800 between the years 1997-2016. An increase in the number of students per foundation university occurred especially in 2011. In general, it can be seen that public universities are large institutions when compared with foundation universities.

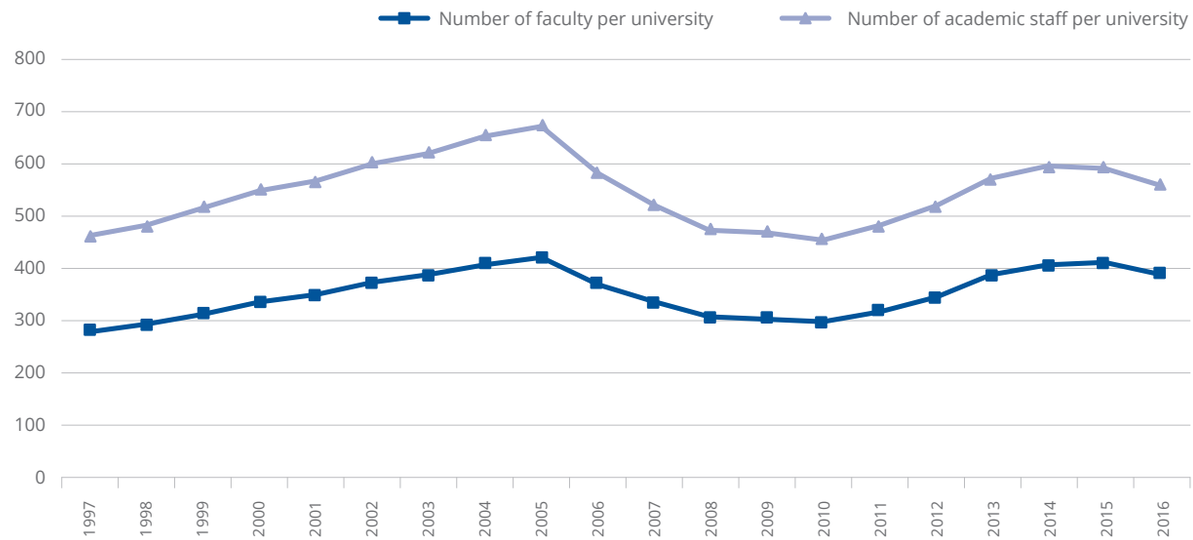
Trends in the numbers of academic staff and faculty per university between the years 1997-2016 are shown in Figure E.2.2. A steady increase in the numbers of academic staff and faculty per university was observed between the years 1997-2005; these numbers increased from 462 to 672 and from 281 to 422, respectively. However, between 2006-2010, the number of faculty per university decreased from 422 to 298 and the number of academic staff per university decreased from 672 to 455. On the other hand, between the years 2011-2015, the number of faculty and academic staff per university continuously increased. During this period, the number of faculty per university increased from 318 to 411 and the number of faculty per university increased from 480 to 593. The decrease in the number of newly founded universities and the efforts to increase the number of faculty at existing universities are the primary reason behind this boost in numbers. Meanwhile, in 2016, the number of academic staff and faculty per university decreased to 389 and 558, respectively.

Figure E.2.1 Trends in the number of students per public and foundation higher education institutions (1997-2016)



Source: Compiled using Higher Education Information System and ÖSYM data.
Note: Number of open education students are excluded.

Figure E.2.2 Trends in the numbers of academic staff and faculty per university (1997-2016)



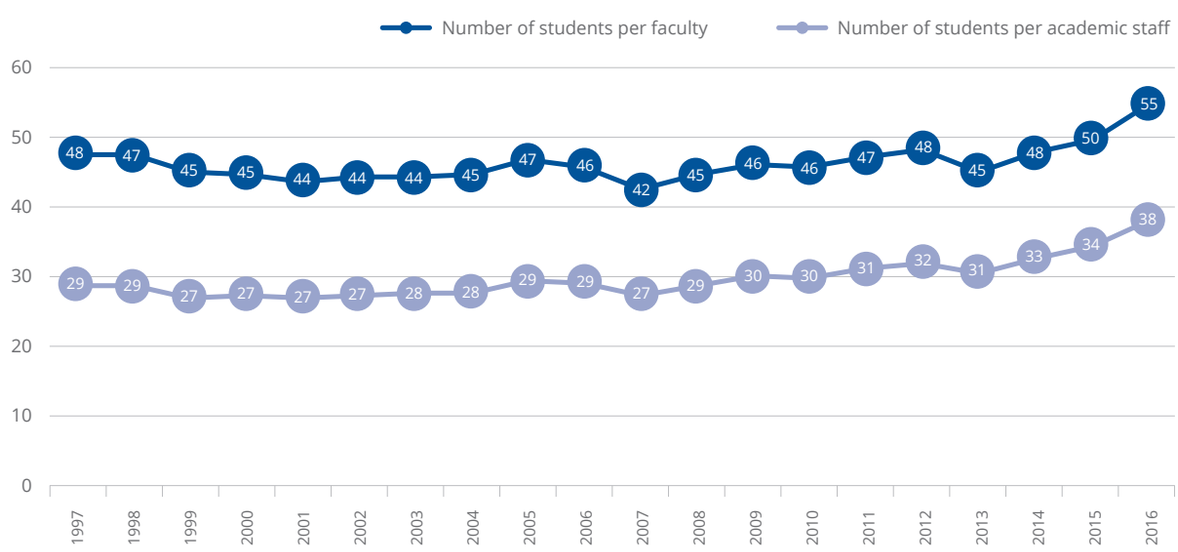
Source: Compiled using Higher Education Information System and ÖSYM data.

INDICATOR E3 NUMBER OF STUDENTS PER FACULTY and ACADEMIC STAFF

Number of students per academic staff and faculty are provided below. **Faculty** include professors, associate professors and assistant professors. **Academic staff**, on the other hand, include language instructors and instructors. Research assistants, experts, translators and educational planners who are considered as **ancillary staff** are excluded from these estimations. According to Article No.33 of Higher Education Law, ancillary staff do not have the obligation of lecturing students. In other words, they do not open courses. For this reason, only those who have the authority to open and teach courses are included in estimations. While estimating the number of students per academic staff, OECD only includes academic personnel whose primary duty is to lecture or research; the teaching assistants of these academic staff are excluded from the estimations (OECD, 2016).

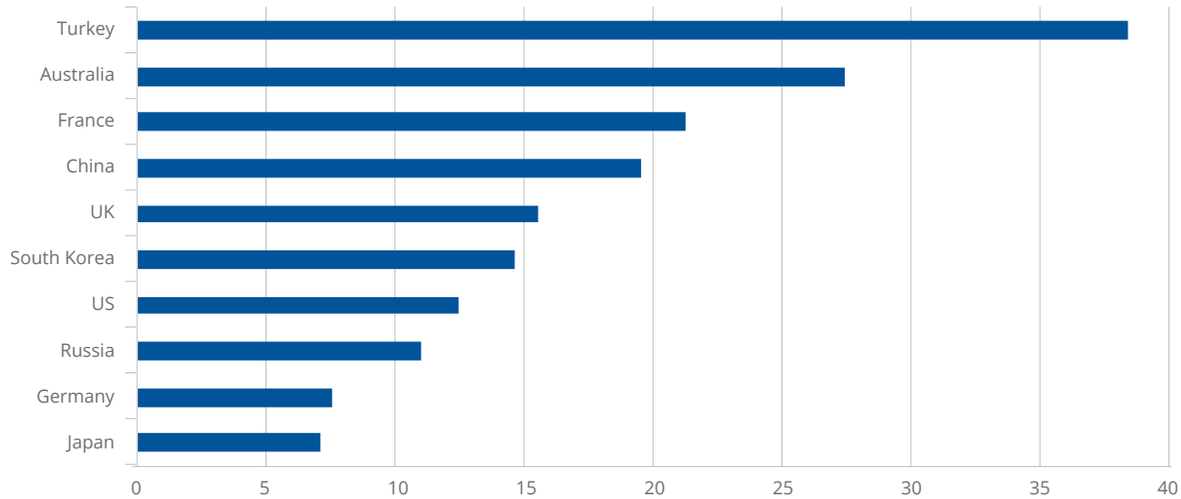
Trends in the number of students per academic staff and faculty are shown in Figure E.3.1. Open education students are excluded from the estimations. Between the years 1997-2016, the numbers of students per faculty and academic staff member increased from 29 to 38 and from 48 to 55, respectively. The number of students per faculty member fluctuates over the years. The number of students per academic decreased from 48 to 44 between the years 1997-2003. A rise in the number of students per faculty began in 2004-2005, increasing to 47. In 2006, a downward trend started and it reached its record low in 2007, that is 42 students per faculty. Again, there was an increase in the number of students per academic between the years 2009-2012, reaching 48. This rate decreased to 45 in 2013; with a swift increase afterwards, it reached 50 in 2015 and eventually to its record high of 55 in 2016. Looking at the number of students per academic staff, it can be seen that it fluctuates between 29-27 during the 1997-2008 period. From 2009 onwards, this rate started to increase steadily, reaching 34 and 38 in 2015 and 2016, respectively.

Figure E.3.1 Trends in the number of students per academic staff and faculty (1997-2016)



Source: Compiled using Higher Education Information System and ÖSYM data.
Note: Number of open education students are excluded.

Figure E.3.2 Number of students per academic staff in selected countries (2014)

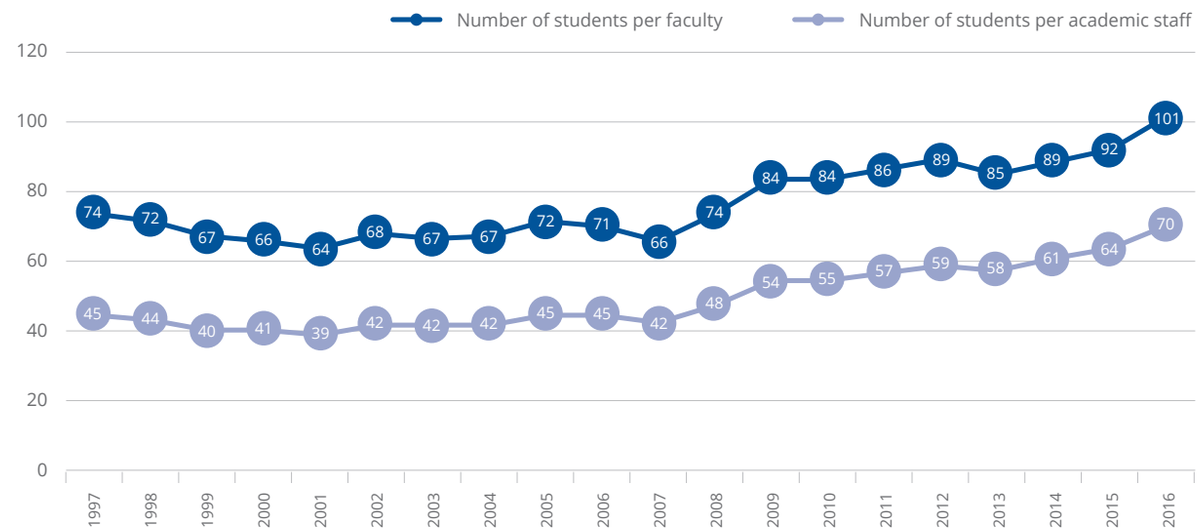


Source: Compiled by using UNESCO statistics database.
Note: For countries that did not have 2014 data, the most current data was used.

In Figure E.3.2, the number of students per higher education academic staff in certain selected countries is compared with Turkey's rates according to UNESCO data. In this respect, there are 7 students per academic staff in Japan, while there are 8 in Germany, 11 in Russia, 13 in the US, 16 in the UK, 19 in China, 21 in France and 27 in Australia. On the other hand, there are 38 students per academic staff in Turkey. **According to UNESCO estimations, the number of students per academic staff in Turkey is fairly higher than those of developed higher education systems.** In other words, Turkey's rate quintuples Germany's rate, while tripling the US and UK rates. Yet, as we are to demonstrate in the following figure, when open education students are added to the equation, this gap between Turkey and other countries widens (Figure E.3.3).

Trends in the number of students (including open education) per academic staff and faculty between the years 1997-2016 are shown in Figure E.3.3. According to the graph, even though there was a downward trend in certain years, the

Figure E.3.3 Trends in the number of students (including open education) per faculty and academic staff (1997-2016)



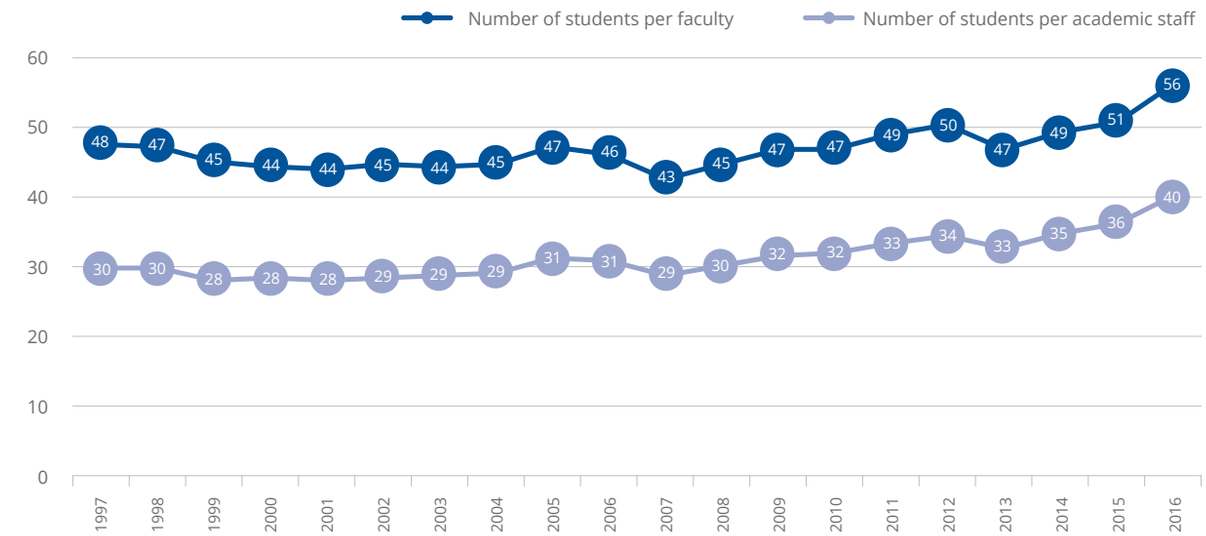
Source: Compiled by using Higher Education Information System and ÖSYM data.
Note: Number of open education students are included.

number of students per faculty increased from 74 in 1997 to 101 in 2016. The number of students per faculty decreased from 74 to 64 between the years 1997-2001. This rate was around 67-68 in the period between 2002 and 2004. The number of students per faculty increased to 72 in 2005, followed by a decline in 2007, reaching 66. With a swift increase, the rate increased to 74 in 2008 and 84 in 2009. The number of students per faculty continued to grow steadily in the following years, reaching 92 in 2015 and 101 in 2016. On the other hand, while the number of students per academic staff was 45 in 1997, this has decreased to 39 in 2001 and then increased to 42 between the years 2002-2004. During the 2005-2006 period, there was a partial increase in this rate; however, it decreased to 42 in 2007. From 2008 onwards, this rate began to rise swiftly; while it was 48 in 2008, it increased to 64 in 2015 and eventually to 70 in 2016. **The primary reason behind the increase in the number of students per faculty is the disparity between the growth rates of student and faculty numbers and the swift growth of the open education system.**

Trends in the number of students per academic staff and faculty at public universities between the years 1997-2016 are shown in Figure E.3.4. Open education students were excluded from these estimations. According to the graph, there was a slight decrease in the number of students per faculty between the years 1997-2004, declining from 48 to 44. Even though this rate was around 45 between the years 2004-2008, fluctuations can be observed. From 2009 onwards, there is an increasing trend in the number of students per faculty, reaching 56 in 2016. On the other hand, the number of students per academic staff demonstrates a rather stable graph. Even though there were slight fluctuations between the years 1997 and 2008, the total number has remained below 30. Between the years 2009-2016, on the other hand, there was a steady increase, reaching 40 in 2016.

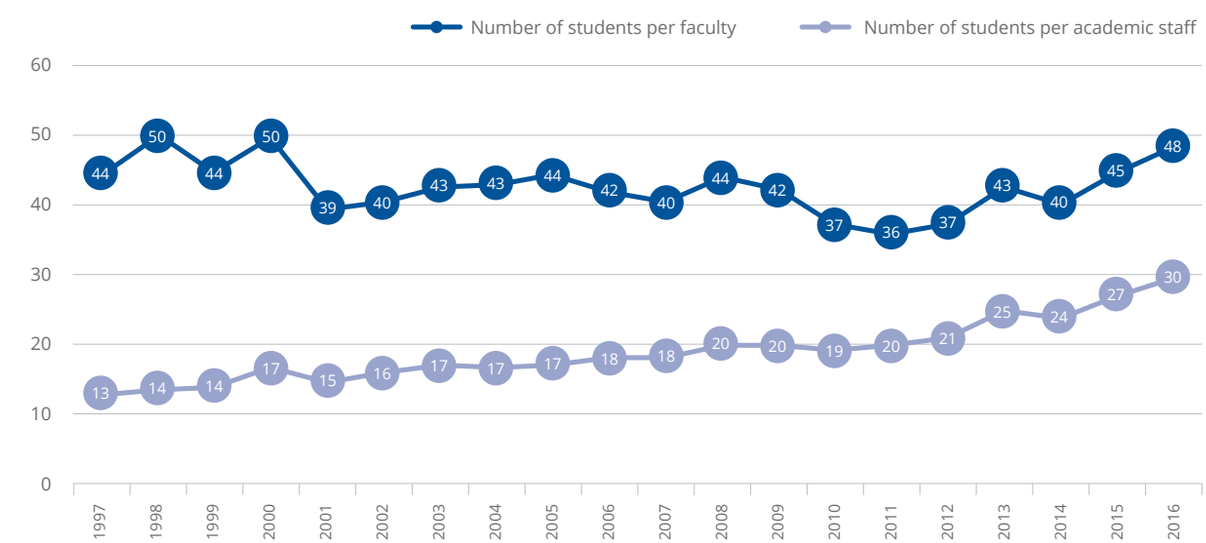
Trends in the number of students per faculty and academic at foundation universities and MYOs between the years 1997-2016 are shown in Figure E.3.5. According to the data, the number of students per faculty increased from 44 in 1997 to 45 in 2015 and 48 in 2016. In other words, there was no significant change in the number at foundation higher education institutions. However, there is a fluctuation in the number of students per academic staff over the years. There is a continuous increase in the number of students per academic staff between the years 1997-2016. While it was 13 students per faculty in 1997, it increased to 30 in 2016

Figure E.3.4 Trends in the number of students per academic staff and faculty at public universities (1997-2016)



Source: Compiled using Higher Education Information System and ÖSYM data.
Note: Number of open education students is excluded.

Figure E.3.5 Trends in the number of students per academic staff and faculty at foundation universities and MYOs (1997-2016)

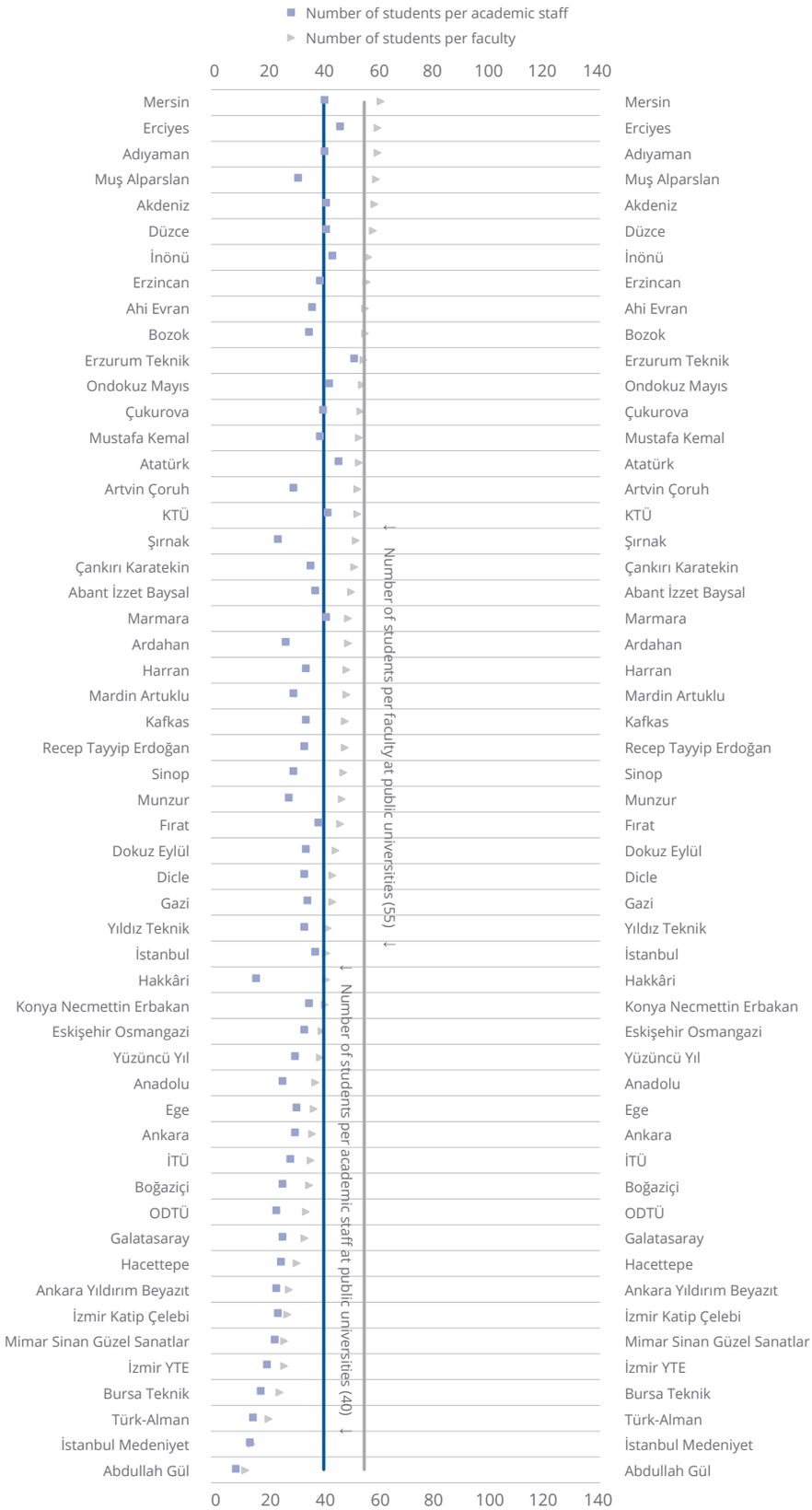


Source: Compiled using Higher Education Information System and ÖSYM data.

Figure E.3.6 Distribution of the number of students per academic staff and faculty at public universities (2016)

Source: Compiled using Higher Education Information Management System data.

Figure E.3.6 Distribution of the number of students per academic staff and faculty at public universities (2016) (continued)



Source: Compiled using Higher Education Information Management System data.
Note: Universities founded after 2011 were not included for the reason that they have a lower numbers of students.

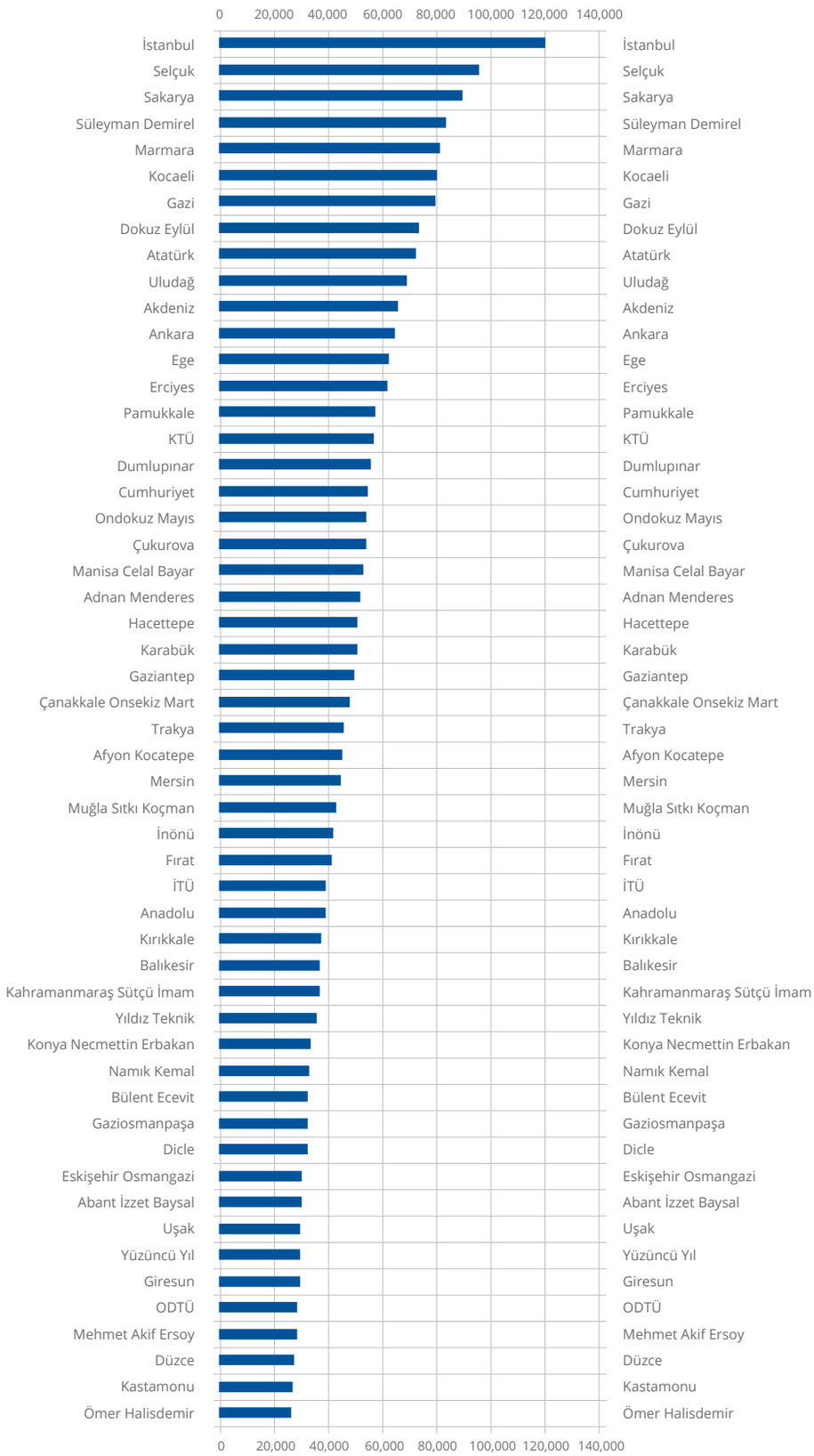
The distribution of the number of students per academic staff and faculty at public universities in 2016 is shown in Figure E.3.6. According to the data, the number of students per academic staff and faculty changes significantly over time for individual universities. While Kırıklareli, Dumlupınar, Karabük, Osmaniye Korkut Ata and Kahramanoğlu Mehmetbey universities have around 100-120 students per faculty, Sakarya, Kocaeli, Yalova, Kastamonu, Uşak and Selçuk universities have over 80 students per faculty. In addition, the number of students per academic staff also changes significantly according to universities. For instance, universities like Dumlupınar, Karabük and Sakarya have more than 60 students per faculty. **In general, universities with higher numbers of students per faculty and academic were founded in 1992 and have a large student body.** On the other hand, there are certain cities that are below Turkey's average in terms of the numbers of students per faculty. Abdullah Gül, Istanbul Medeniyet and Adana Science and Technology universities have around 10-20 students per faculty, while universities like Turkish-German, Bursa Technical, İzmir Institute of Technology, Mimar Sinan, İzmir Katip Çelebi and Ankara Yıldırım Beyazıt have around 20-30 students per academic. Moreover, the number of students per academic staff is below 20 at Abdullah Gül, Istanbul Medeniyet, Adana Science and Technology, and İzmir Institute of Technology universities. Most of these universities were founded in 2010 and their student body is expected to grow in the following years.

Public universities with student bodies of over 25,000 in the 2016-2017 academic year are shown in Figure E.3.7. According to this graph, that excludes open education students, Istanbul University is the largest with 120,000 students. Selçuk, Sakarya, Süleyman Demirel, Marmara, Kocaeli and Gazi universities, on the other hand, have a student body larger than 80,000. Dokuz Eylül, Atatürk, Uludağ, Akdeniz, Ankara, Ege and Erciyes universities have around 60,000-80,000 students.

Public universities with student bodies under 25,000 in the 2016-2017 academic year are shown in Figure E.3.8. With the exception of universities like Boğaziçi, Galatasaray, Mimar Sinan, Gebze Technical, almost all of the universities on this list were founded after 2006. In addition, universities founded after 2010 have smaller student bodies in comparison with those founded between the years 2006-2008. This is due to the fact that universities founded between the years 2006-2008 have completed their institutionalization and host more students.

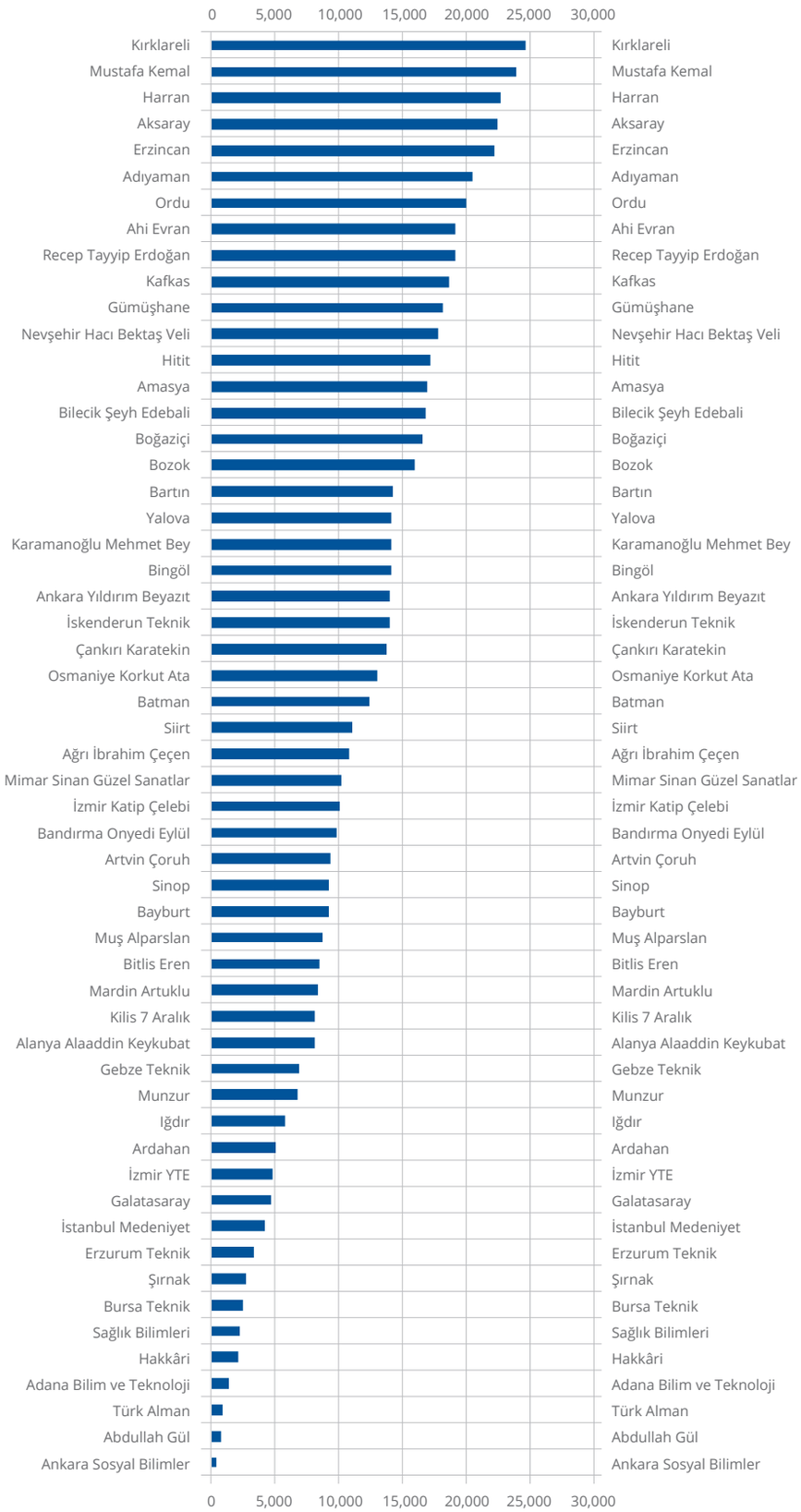
Number of higher education students by city during the 2016-2017 academic years is shown in Figure E.3.9. The data indicates that the numbers of students vary by city. The number of universities in a city, the foundation year of universities and the city's development are factors that affect the number of students. In this respect, there are 760,000 students at 11 public and 42 foundation university in Istanbul, while there are 302,000 at 7 public and 10 foundation universities in Ankara, 172,000 at 6 public and 2 foundation universities in İzmir and 135,000 at 2 public and foundation universities in Konya. There are around 80,000-90,000 students in Sakarya, Kocaeli and Isparta; meanwhile, Erzurum, Antalya and Bursa host around 70,000-80,000 students each. On the other hand, Artvin, Sinop, Bayburt, Muş, Bitlis, Mardin, Kilis, Tunceli, Iğdır, Ardahan, Şırnak and Hakkari host less than 10,000 students each.

Figure E.3.7 Public universities with student bodies over 25,000 (2016)



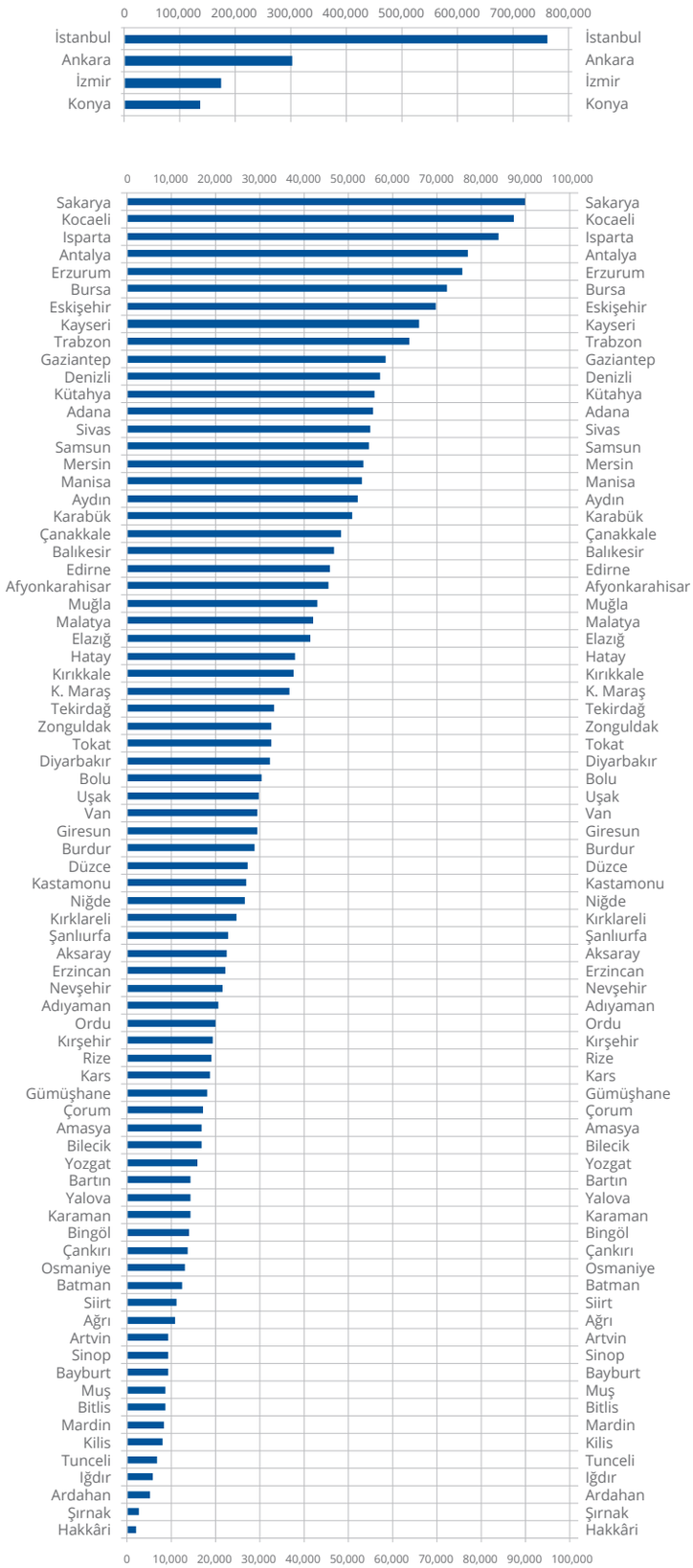
Source: Compiled using Higher Education Information Management System data.

Figure E.3.8 Public universities with student bodies under 25,000 (2016)



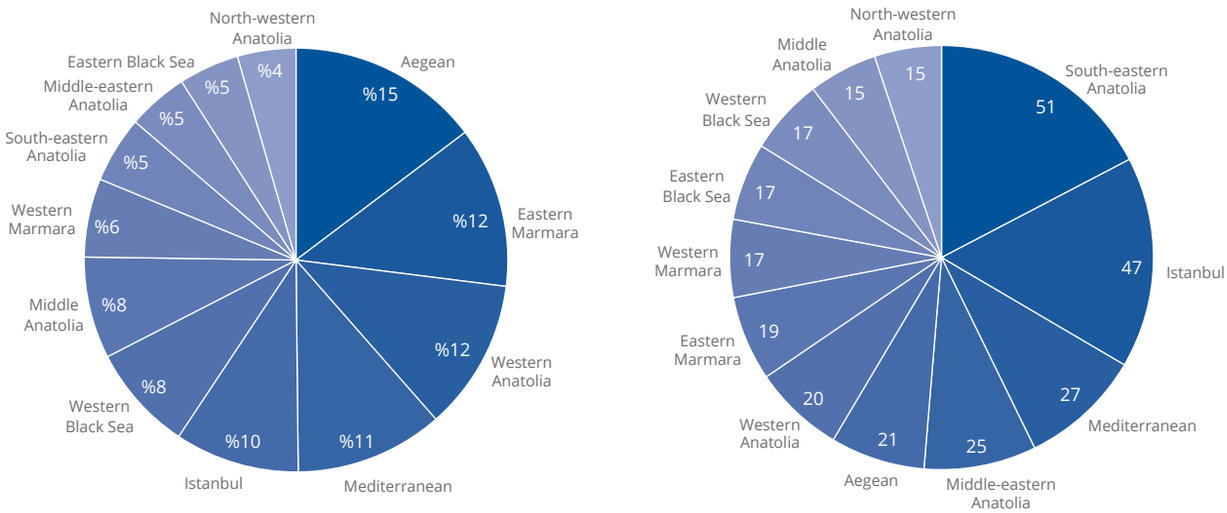
Source: Compiled using Higher Education Information Management System data.

Figure E.3.9 Number of higher education students by city (2016)



Source: Compiled using Higher Education Information Management System data.

Figure E.3.10 Distribution of students at public universities and population per student by region (2016)

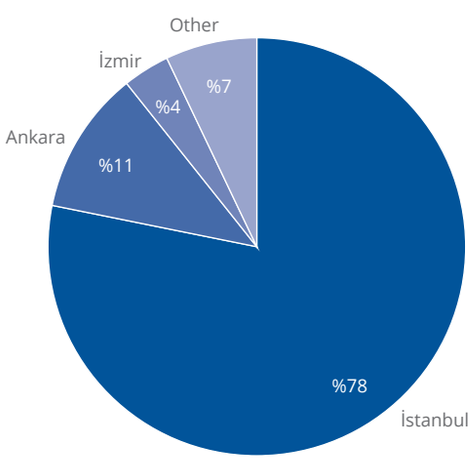


Source: Compiled using Higher Education Information Management System data.

Figure E.3.10 displays the distribution of students at public universities and the population per student by region in 2016. The data indicates that the regions that have the largest student body are the Aegean, Eastern Marmara, Western Anatolia, Mediterranean and Istanbul in descending order. However, considering the populations in these regions and the population per student, the said rankings change. Northeastern Anatolia (Erzurum, Erzincan, Bayburt, Ağrı, Kars, Iğdır, Ardahan), Middle Anatolia (Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir, Kayseri, Sivas, Yozgat) and the Western Black Sea (Zonguldak, Karabük, Bartın, Kastamonu, Çankırı, Sinop, Samsun, Tokat, Çorum, Amasya) regions have the highest student density, thus less population per student. On the other hand, Southeastern Anatolia, Istanbul and the Mediterranean regions have a low student density.

The distribution of students at foundation universities by region is shown in Figure E.3.11. According to the data, 78% of foundation higher education institutions' students are studying in Istanbul, while 11% in Ankara, 4% in İzmir and 7% in various other cities (Gaziantep, Mersin, Trabzon, Konya, Nevşehir, Kayseri, Antalya and Bursa). As it can be assessed from these numbers, there is a significant difference between the distribution of public (Figure E.3.10) and foundation universities by region. In other words, **considering the distribution of the population by region, public universities are more homogeneously distributed across the country in comparison to foundation universities.** On the other hand, foundation universities are mostly concentrated in Istanbul.

Figure E.3.11 Distribution of students at foundation universities by region (2016)



Source: Compiled using Higher Education Information Management System data.

INDICATOR E4

GREEN CAMPUS

The GreenMetric World University Ranking was developed by the University of Indonesia in 2010. This ranking aims to assess universities around the world in terms of having a green campus, policies and performances on sustainability. In this respect, the heads of the university and their partners are trying to raise awareness about global climate change and ways to fight it, the conservation of energy and water, waste recycling and green transportation. Universities are assessed according to their performances in said aspects and are ranked accordingly. This ranking first took place in 2010 and 95 universities were on the list. All universities can join GreenMetric. Over the years, the number of applicant universities have increased. 516 universities from more than 70 countries took part in GreenMetric in 2016. 17 universities from Turkey participated in the ranking. Ranking is conducted within six basic categories: structure and infrastructure (15%), energy and climate change (21%), waste (18%), water (10%), transportation (18%) and education (18%). Total area, areas dedicated to buildings, green space, forest, water, number of students and academic/administrative personnel along with the budget for sustainability are indicators of the structure and infrastructure category. On the other hand, usage of energy efficient equipment, renewable energy policy, usage of electricity, energy conservation programs, green building, adaptation to climate change and programs that aim to mitigate climate change are some of the criteria for the energy and climate change category. In the waste category recycling, recycling toxic wastes, organic and inorganic wastes and sewage are some of the aspects considered. Regarding the water category, water conservation and decreasing the usage of water are the main criteria. Meanwhile, for the transportation category, limitations on motor vehicles on campus, support for public transportation and bicycles within the campus, the usage of walkways and the prevention of the usage of privately owned motor vehicles are some of the indicators. The number of courses on sustainability, the budget for research on sustainability, number of publications, events and student events are some of the indicators for the education category (Bülent Ecevit University, 2017; University of Indonesia, 2017).

Rankings of the top ten GreenMetric universities and Turkish universities that participated are shown in Table E.4.1. There are 5 universities from England, 3 from the US, 1 from the Netherlands and 1 from Austria among the top ten. The University of California, Davis ranked first. Looking at the rankings, the most successful university from Turkey is the Bülent Ecevit University that ranked 195th. Bülent Ecevit University is followed by Sabancı University (233rd) and Boğaziçi University (259th). Looking at individual categories, it can be seen that Turkish universities rank higher in certain categories, while ranking significantly lower in others. For instance, in terms of structure and infrastructure, Bilkent University ranked 21st, Sabancı University 60th, Bartın University 73rd and Bülent Ecevit University 97th. In the energy and climate change category, Sabancı University ranked 72nd, Bartın University 78th, Hittite University 160th and Bülent Ecevit University 206th. In the waste category, Bülent Ecevit University ranked 284th and TOBB ETÜ 285th. On the other hand, in the water category, Bülent Ecevit University ranked 118th, Sabancı University 132nd and İnönü University 134th. In the transportation category, Ege University ranked 127th, Boğaziçi 145th and TOBB ETÜ 160th. Meanwhile, in the education category, Hittite University ranked 183rd, Boğaziçi University 189th and Karabük University 229th.

Table E.4.1 Rankings of the top ten GreenMetric universities and Turkish universities (2016)

Ranking	University	Country	Total Score	Structure and infrastructure	Energy and climate change	Waste	Water	Transportation	Education
1	University of California, Davis	US	8,398	1,257	1,340	1,800	932	1,687	1,382
2	University of Nottingham	England	8,079	1,200	1,448	1,800	992	1,190	1,449
3	Wageningen University	Netherlands	7,658	1,118	1,221	1,800	742	1,068	1,709
4	University of Connecticut	US	7,602	966	1,187	1,650	1,000	1,307	1,492
5	University of Oxford	England	7,591	898	1,259	1,701	948	1,450	1,335
6	University of Natural Resources and Life Sciences Vienna	Austria	7,386	1,083	1,033	1,800	726	1,103	1,641
7	Keele University	England	7,254	1,368	1,342	1,575	650	966	1,353
8	University of California, Berkeley	US	7,156	815	1,159	1,650	1,000	1,318	1,214
9	Nottingham Trent University	England	7,126	1,080	1,304	1,800	625	1,013	1,304
10	Newcastle University	England	7,081	783	1,204	1,650	725	1,356	1,363
195	Bülent Ecevit University	Turkey	4,839	983	836	975	600	950	495
233	Sabancı University	Turkey	4,511	1,077	1,085	675	565	770	339
259	Boğaziçi University	Turkey	4,366	753	711	801	350	966	785
271	TOBB ETÜ	Turkey	4,284	599	777	975	360	951	622
284	Özyeğin University	Turkey	4,205	867	659	501	675	827	676
304	Hittite University	Turkey	4,061	781	918	423	330	803	806
318	Ankara University	Turkey	3,952	703	561	927	164	909	688
324	Bartın University	Turkey	3,885	1,045	1,070	675	200	455	440
337	Ege University	Turkey	3,790	862	448	927	240	993	320
343	İnönü University	Turkey	3,746	543	811	777	560	679	376
344	İ.D. Bilkent University	Turkey	3,743	1,185	312	750	230	769	497
364	Düzce University	Turkey	3,577	674	520	525	520	800	538
412	Karabük University	Turkey	3,217	565	445	450	195	853	709
436	Kilis 7 Aralık University	Turkey	3,022	379	677	825	150	852	139
464	Selçuk University	Turkey	2,685	374	263	876	50	950	172
473	Celal Bayar University	Turkey	2,584	764	100	699	230	452	339
484	İzmir University of Economics	Turkey	2,331	517	543	498	90	603	80

Source: University of Indonesia (2017).

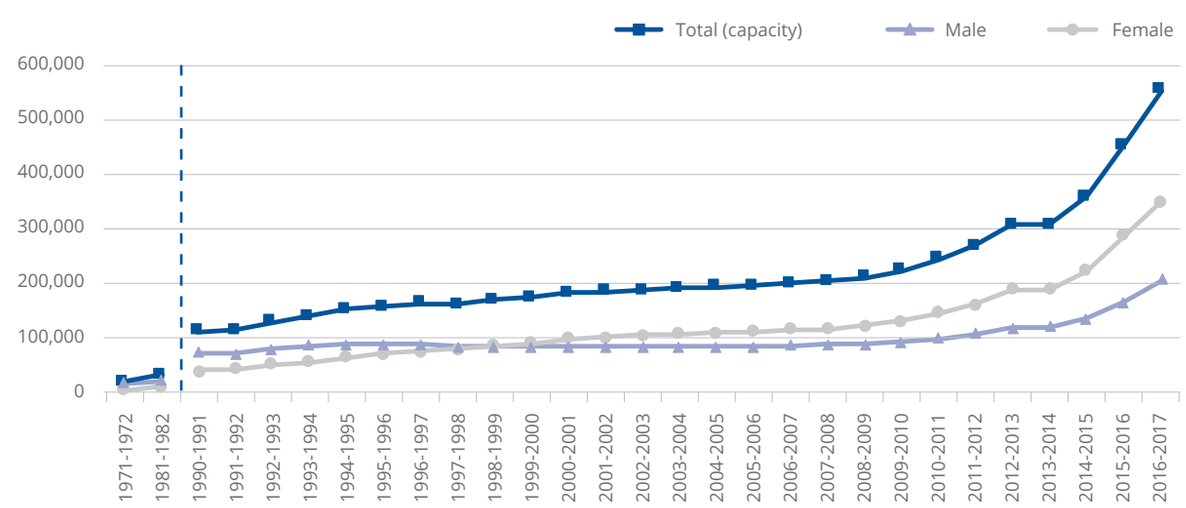
INDICATOR E5 DORMITORIES

In this part, various data on dormitories belonging to the Loans and Dormitories Institution (LDA) and private enterprises are discussed.

Trends in the LDA dormitory capacities according to gender between the years 1971-2016 are shown in Figure E.5.1. LDA dormitories had a capacity of 19,000 in 1971; 3,000 was dedicated to females, while the remaining 16,000 was allocated to males. The capacity was increased to 31,000 in 1981; 10,500 was dedicated to females and 20,500 to males. The number of students in Turkey was around 335,000 at the time. In other words, only 1 out of every 10 students was able to stay in the dormitories. In 1990, there was a significant increase in LDA dormitories' capacities; it reached 111,000. 40,000 was dedicated to females, while 71,000 was allocated to males. Excluding open education students, the number of students increased to approximately 500,000 at the time. With the foundation of new public universities in 1992, there was a swift increase in the number of university students. In 1993, the number of students was around 700,000, with the exclusion of open education students. During this time, two females for every three males were admitted to higher education programs. Similar to the increase in the number of students, the capacity of LDA dormitories grew significantly, reaching 139,000. 84,000 of this capacity was devoted to males, while 55,000 was devoted to females. Thus, 1 out of every 4 students were able to stay in these dormitories. The growth in the number of students continued from 1993 onwards; excluding open education students, this number reached 1.1 million in 2000. Meanwhile, the capacity of dormitories increased to 180,000 during the same period. In other words, 1 out of every 6 students was able to stay in the dormitories. 97,000 of this capacity was dedicated to females, 83,000 was dedicated to males in the year 2000. **While male dormitory capacity has been stagnating from 1992 onwards, the dormitory capacity for females increased swiftly.**

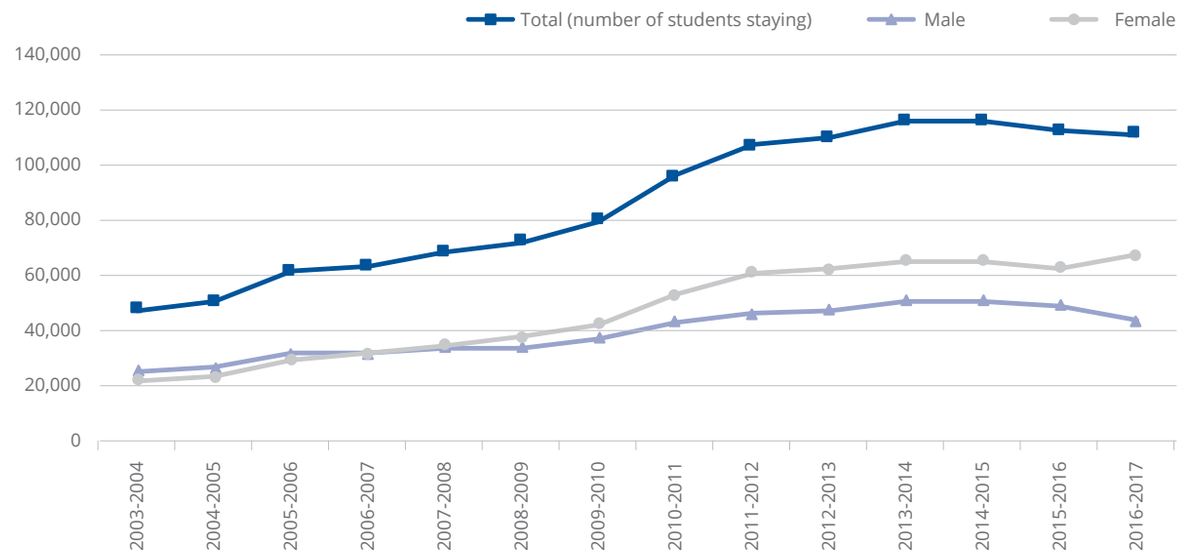
Excluding the open education students, the number of students reached 1.75 million in 2008. During the same period, the LDA dormitory capacity increased to 208,000 (Figure E.5.1). 1 out of every 9 students was able to stay in a dormitory. Looking at the distribution of this capacity be-

Figure E.5.1 Trends in the LDA dormitory capacities by gender (1971-2016)



Source: Compiled using MONE statistics and LDA activity reports published in various years.

Figure E.5.2 Trends in the number of students staying in private dormitories by gender (2003-2016)



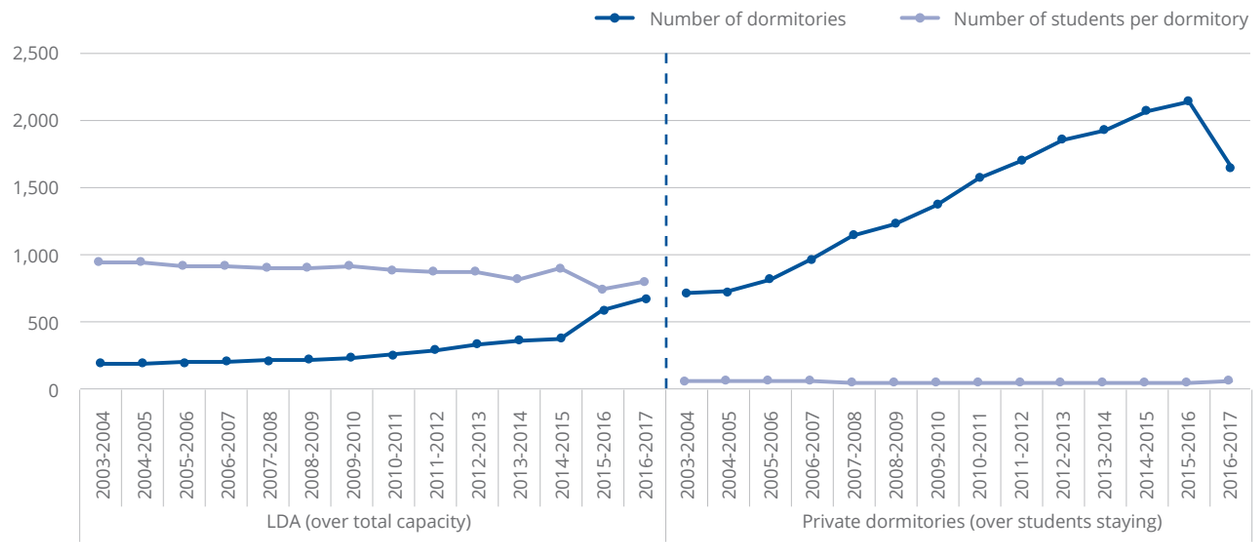
Source: Compiled using MONE statistics published in various years.

tween males and females, the capacity for females reached 120,000, while reaching 88,000 for males. After 2008, the higher education system started to grow immensely. As a result of this growth, the number of students reached 3.9 million by 2016, with the exclusion of open education students. Meanwhile, the dormitory capacity increased to 552,000 in 2016; meaning that there was spa for 1 out of every 7 students in the dormitories. 347,000 were dedicated to women, while 204,000 went to men.

Trends in the number of students staying in private dormitories according to gender between the years 2003-2016 are shown in Figure E.5.2 (pre-2003 data is not available). Between the years 2003-2016, the number of students staying in higher education dormitories experienced a growth of 250%. A total 48,000 students, 22,000 females and 26,000 males, stayed in private dormitories. As previously stated, following the growth of the higher education sector, the number of students staying in private dormitories also started to increase. Currently 111,000 students, 43,500 females and 67,500 males, stay in private dormitories.

Trends in the number of dormitories and the number of students/capacity per dormitory by type between the years 2003-2016 are shown in Figure E.5.3 (pre-2003 statistics are unavailable). While there were 199 LDA dormitories in 2003, this increased to 241 in 2009 and 390 in 2014. In the following two years, the number of LDA dormitories grew significantly, reaching 682. There was a decrease in the capacity per LDA dormitory over the years. While capacity per dormitory was 949 in 2003, this declined to 880 in 2011 and 809 in 2016. There was a swift increase in the number of private dormitories be-

Figure E.5.3 Trends in the number of dormitories and the number of students/capacity per dormitory by type (2003-2016)

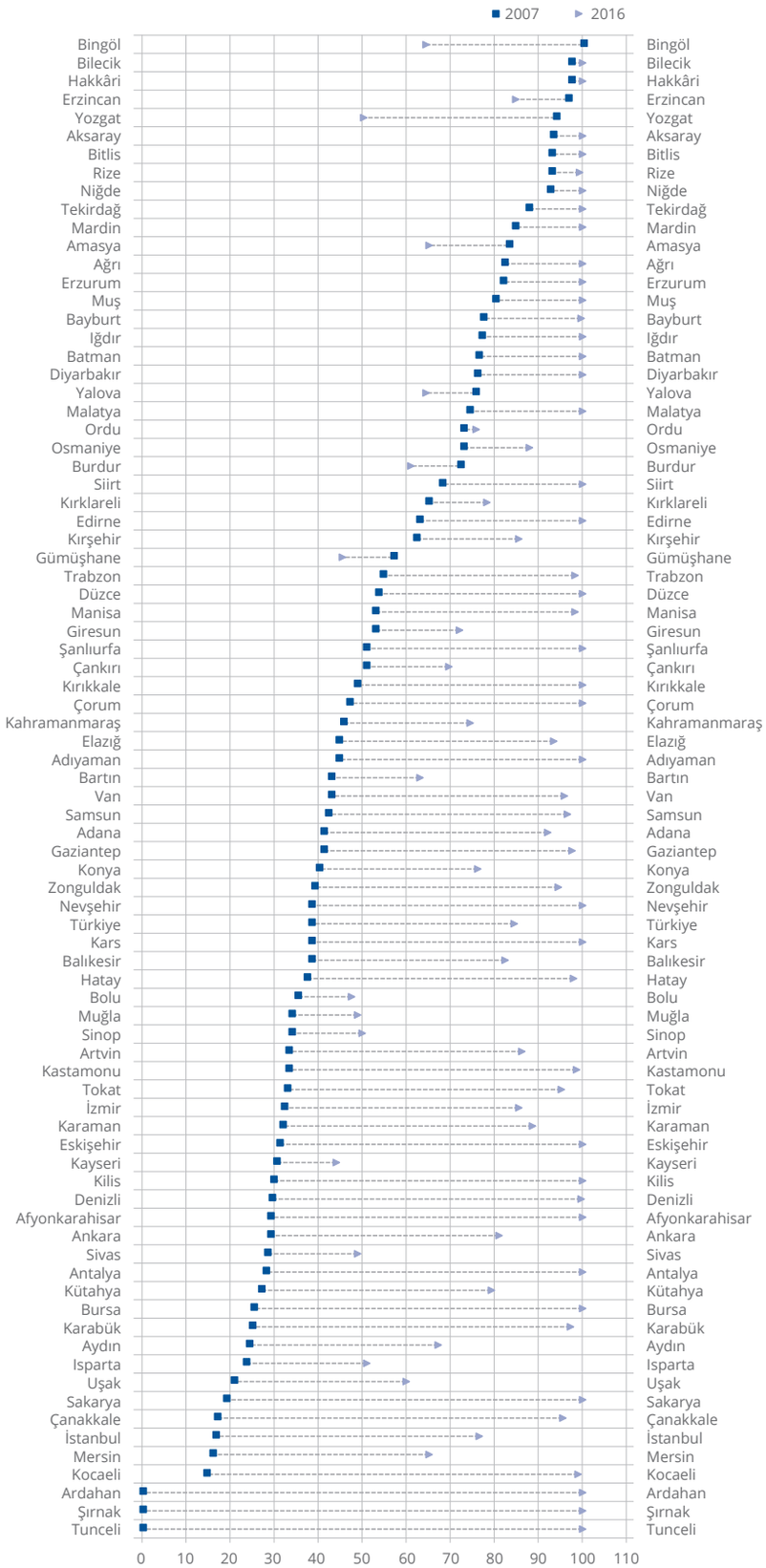


Source: Compiled using MONE statistics and LDA activity reports published in various years.

tween the years 2003-2015, rising from 728 to 2,160. In 2016, however, it declined to 1,666. The number of students per private dormitory is fairly low. While there were 66 students per private dormitory in 2003, this decreased to 52 in 2015 and rose to 67 in 2016. When compared with LDA dormitories, it can be seen that there are more private dormitories; however, their capacities are significantly lower than LDA dormitories. In general, private dorms are small-scale buildings which are transformed from regular apartment blocks. Moreover, as certain dormitories only have single rooms, the number of students staying in dormitories decreases.

Trends in the admittance rates of LDA dormitories by city in the years 2007 and 2016 are shown in Figure E.5.4. The admittance rate into LDA dormitories vary by city and year. In 2007, 100% of those who applied to LDA in Bingol were admitted, similarly the admittance rates of Bilecik, Hakkari and Erzincan are close to 100%. On the other hand, Aksaray, Bitlis, Rize, Niğde and Tekirdağ have an admittance rate of over 90%. Universities in these cities were all founded after 2006. However, before these universities were founded, these cities already hosted certain faculties of universities in nearby cities. Moreover, there were no LDA dormitories in Ardahan, Şırnak and Tunceli. Universities in these cities were founded in 2008. The cities with the lowest admittance rates were Kocaeli, Mersin, İstanbul, Çanakkale and Sakarya in 2007; the rate is below 20% in these cities. Excluding those in Istanbul, universities in the aforementioned cities were founded in 1992. In 2016, the admittance rate in cities like Tunceli, Şırnak and Ardahan where LDA did not have any dormitories along with Çanakkale, Karabük, and Kütahya, which had admittance rates lower than 20%, reached 100%. The lowest admittance rates in 2016 were around 40-50% and were observed in Sivas, Kayseri, Bolu, Sinop and Muğla. The greatest change in the admittance rates occurred in cities that previously did not have LDA dormitories (Figure E.5.4). There is a 100-point increase in admittance rates in Ardahan, Şırnak and Tunceli, while Kocaeli and Sakarya enjoyed an 80-point increase. Karabük and Bursa, on the other hand, experienced a 75-point increase in the admittance rates, while Afyonkarahisar, Denizli and Kilis saw a 70-point increase. This data indicates that the LDA dormitory capacities were increased in parallel with the higher education capacity from 2007 onwards. Meanwhile, in 2007 and 2016, there was a decrease in the admittance rates of LDA dormitories in Yozgat and Bingöl (35 points) along with Erzincan, Amasya, Yalova, Burdur and Gümüşhane (10-20 points). The possible reason is that the LDA dormitory capacities in these cities were not increased accordingly with the rising number of students.

Figure E.5.4 Trends in the admittance rates of LDA dormitories by city (2007, 2016)

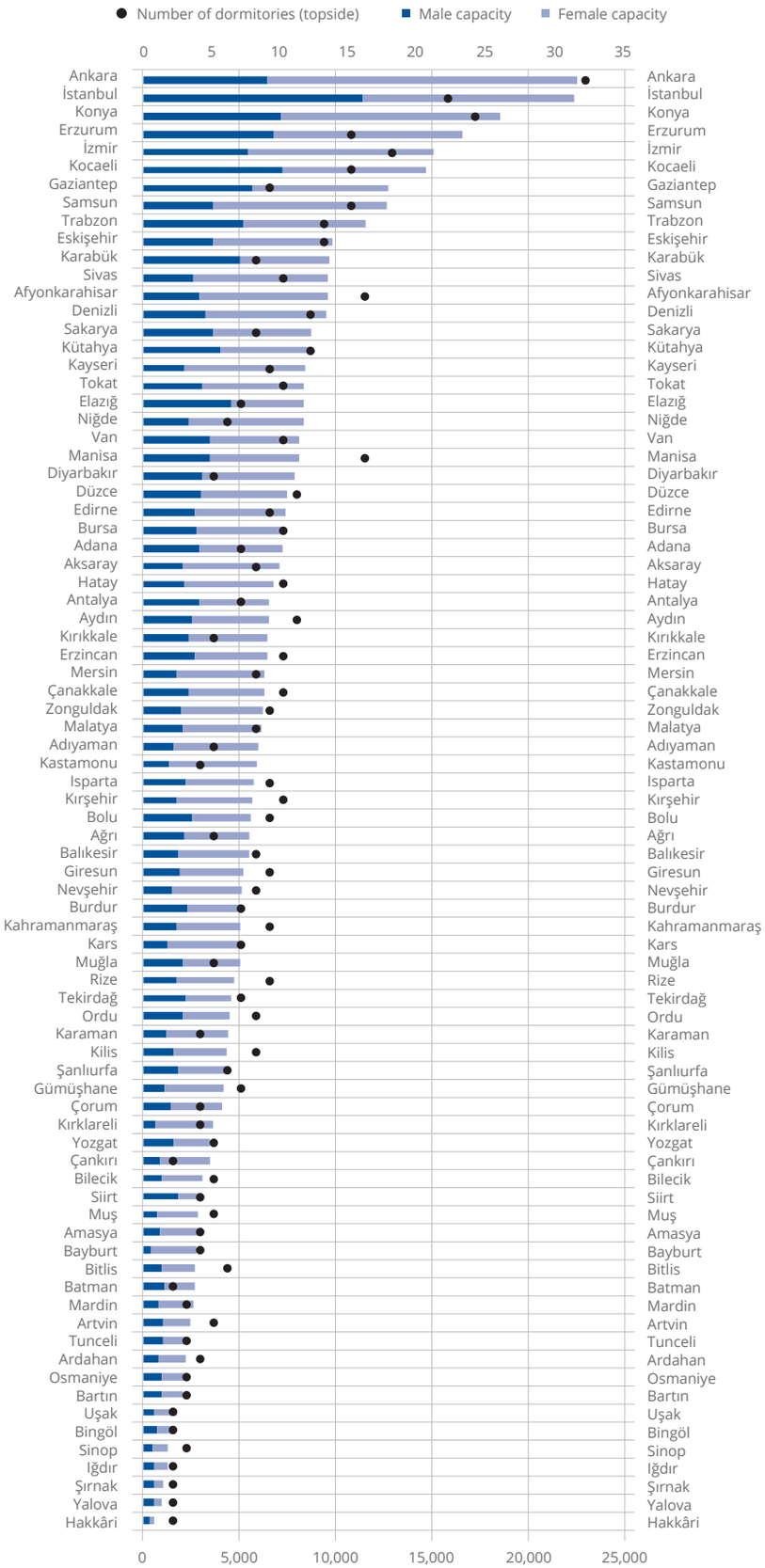


Source: Compiled using LDA data.

The number of LDA dormitories and their capacities by city and gender are displayed in Figure E.5.5. The data indicates that the majority of LDA dormitories are in Ankara (32). Ankara is followed by Konya (24) and İstanbul (22). Afyonkarahisar, Samsun, Kocaeli, İzmir and Ezurum have more than 15 LDA dormitories each. On the other hand, Batman, Çankırı, Uşak, Bingöl, Sinop, Iğdır, Şırnak, Yalova and Hakkari have 2 LDA dormitories each. Looking at the total capacity of LDA dormitories, it can be seen that the largest capacity is in Ankara (22,500). Even though it has less dormitories than Konya, İstanbul has a dormitory capacity of 22,400, while in Konya its 18,500. These cities are followed by Erzurum (16,600), İzmir (15,100), Kocaeli (14,700), Gaziantep (12,700), Samsun (12,600) and Trabzon (11,600). Cities that have the least dormitory capacity are Hakkari (500), Yalova and Şırnak (950), Iğdır and Sinop (1,250), Bingöl (1,650) and Uşak (1,700). **According to the data, the LDA dormitories capacity is not in parallel with the total number of university students nor the largeness of cities.** Student's inabilities to find houses for rent in cities with limited dormitory capacities creates a housing issue.

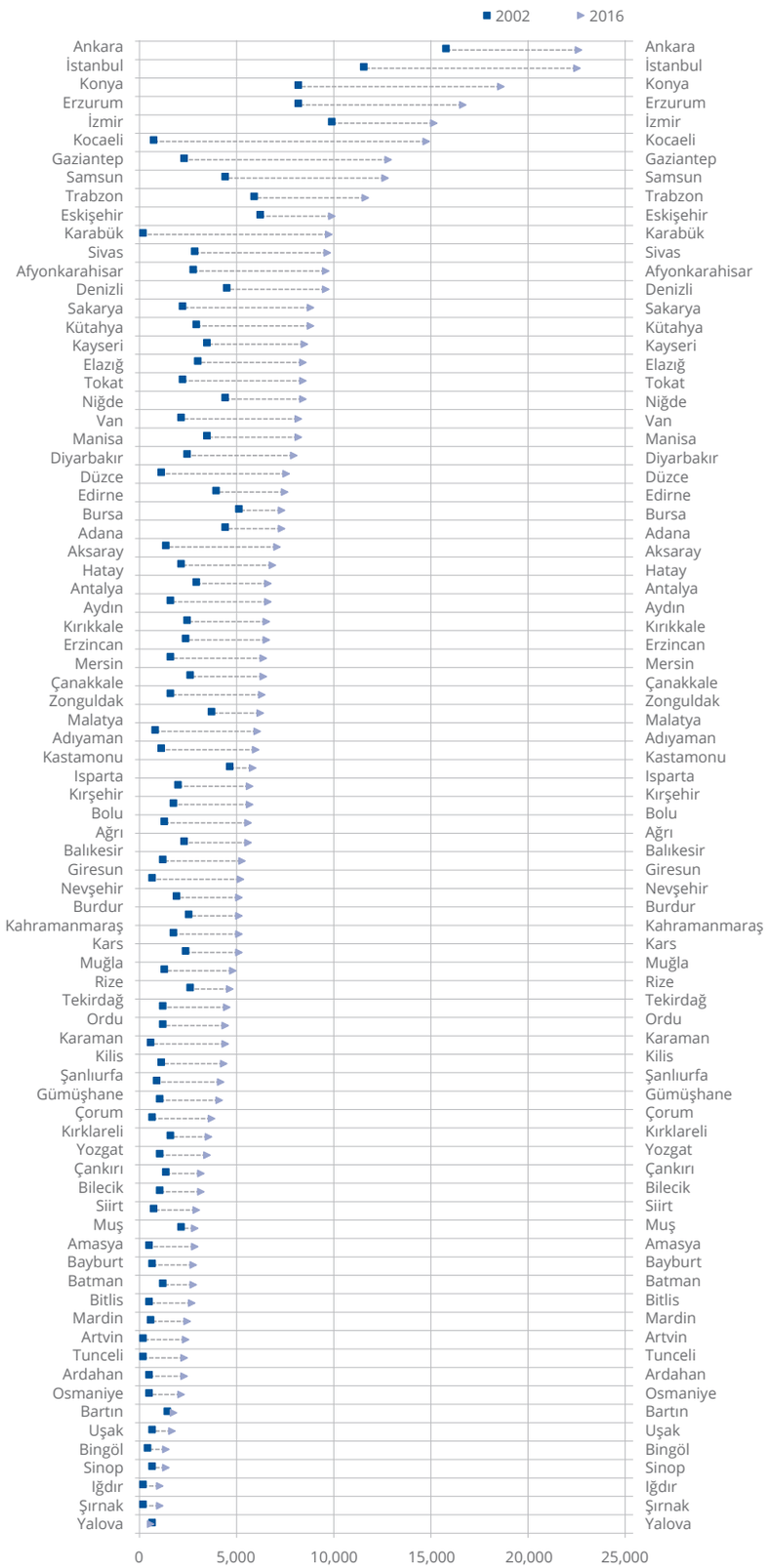
Looking at the distribution of LDA dormitory capacities allocated to females by city, it can be seen that the highest capacity is once again in Ankara with 16,100 (Figure E.5.5). Ankara is followed by Konya (11,350), İstanbul (11,050), Erzurum (9,900), İzmir (9,700) and Samsun (9,000). On the other hand, Hakkari, Yalova, Şırnak, Iğdır, Sinop and Bingöl have capacities of 250, 400, 450, 700, 750 and 950 dedicated to females, respectively. Looking at the LDA dormitory capacity dedicated to females, Istanbul comes first with 11,350.İlstanbul is followed by Kocaeli (7,250), Konya (7,150), Erzurum (6,700) and Ankara (6,450). The cities with the least LDA dormitory capacity dedicated to males are Hakkari (250), Bayburt (350), Şırnak, Iğdır, Sinop and Uşak (500). Moreover, Yalova, Bingöl, Bartın, Osmaniye, Ardahan, Mardin, Bitlis, Amasya, Muş, Bilecik and Kırklareli are other cities that have less than 1,000 dorms dedicated to males. Trends in the LDA dormitory capacities by city in the years 2002 and 2016 are shown in Figure E.5.6. The data indicates that there is a significant increase in the dormitory capacities in all cities between the years 2002 and 2016. The most significant increase occurred in Kocaeli. The LDA dormitory capacity which was 600 in 2002 increased to 14,700 in 2016. The second most prominent increase occurred in Karabük; while Karabük did not have any LDA dormitories in 2002, the dormitory capacity rose to 9,600 in 2016. Karabük being a small Anatolian city makes this increase more prominent. Meanwhile, Ankara's LDA dormitory capacity increased from 15,500 in 2002 to 22,500 in 2016. Similarly, İstanbul's dormitory capacity increased from 11,400 to 22,400 during the same period. On the other hand, between 2002 and 2016, Konya's dormitory capacity rose from 8,000 to 18,500, Erzurum from 8,000 to 16,600 and İzmir from 9,800 to 15,100. On the other hand, the increase in LDA dormitory capacity was limited in certain cities. For instance, Isparta's capacity increased from 4,400 to 5,700, Amasya from 2,000 to 2,800 and Uşak from 1,250 to 1,650. While Yalova, Şırnak Ardahan and Tunceli did not have any LDA dormitories in 2002, dormitories were opened in the following years; however, the capacity of these dormitories remain fairly limited.

Figure E.5.5 Number of LDA dormitories and their capacities by city and gender (2016)



Source: Compiled by using LDA data.

Figure E.5.6 Trends in the LDA dormitory capacities by cities (2002, 2016)



Source: Compiled using LDA data.

CHAPTER E

HIGHLIGHTS

The number of higher education institutions which was 19 in 1981 swiftly rose and reached 183 in 2016 (Figure E.1.1) 112 of these higher education institutions are public universities, while the remaining 71 are foundation universities and MYOs. There are three waves in the growth of Turkey's higher education system and in the number of universities. The first wave included the foundation of 19 universities prior to 1982 and 8 new public universities in 1982. The second wave occurred in 1992; 23 new universities were founded in this year. The third wave which increased the number of universities the most took place between 2006 and 2008. During this period 41 public universities, 9 foundation universities and 1 foundation MYO were founded. As a result, by 2008, every city in Turkey had at least one university within its city boundaries (Figure E.1.2).

Despite all attempts to expand the higher education system in Turkey, there is a disparity between the supply and demand; one out of every three people has access higher education. Excluding open education and associate's degree programs, it can be seen that there is a limited supply of bachelor's degree programs. Attempting to relieve this pressure, quotas and capacities of the existing universities are increased. However, this causes universities to become massive structures. **Looking at a number of universities in countries with a comparable population size to that of Turkey, it can be seen that the number of universities in Turkey is inadequate.** While the number of universities per 1 million is 2.1 in Turkey, this rate is over 10 in the US, Russia, Denmark, Malaysia, Poland, Switzerland and Norway. In other words, considering their population size, the aforementioned countries have five times more universities than Turkey (Figure E.1.3).

While there were 58 faculties in 1981, this number has reached 1,435 with a 25 times growth over the years. The growth rate of faculties was parallel to the growth rate of the higher education system (Figure E.1.4). However, almost every university in Turkey has similar faculties; therefore, regional needs are not taken into regard. **While faculties of sciences and letters were prioritized before 1982, applied social sciences like business management and economy were prioritized after 2006.** This indicates that universities have similar faculties and that there is a lack of diversity among universities (Karataş, Acer and Güçlü, 2017).

Trends in the number of higher education schools indicate a growth parallel to the higher education system. While there were 7 higher education schools in 1982, this has increased to 383 in 2016 (Figure E.1.5). The number of MYOs, on the other hand, increased from 22 in 1982 to 902 in 2016 (Figure E.1.7). Similarly, the number of institutes increased from 97 to 626 between the years 1982-2016. The number of R&D Centres also increased swiftly; while there were 38 R&D Centres in 1981, the number increased to 300 in 2008 and eventually reached 2,452 in 2016 (Table E.1.8). **The most important issue is whether R&D Centres are conducting research and applications effectively.**

According to February 2017 data, 1,224 faculties are at public universities, while the remaining 403 are at foundation universities (Table E.1.10). However, while 10,018 master's degree programs are

conducted by public universities, foundation universities only offer 2,019. Moreover, 4,832 out of 5,253 doctorate programs are at public universities. Moreover, 118 proficiency in arts programs out of a total 130 are also held at public universities, while foundation universities only have 12. **All this data indicates that various programs, especially graduate studies, are concentrated in public universities.**

Looking at the trends in the number of students per university between the years 1997-2016, it can be seen that the number of students per public university increased from 17,000 to 30,000 and the number of students per foundation university increased from 1,300 to 8,000 (Figure E.2.1). **This data indicates that public universities are larger institutions than foundation universities.**

Excluding the open education students, the number of students per faculty between the years 1997-2016 has increased from 48 to 55; similarly, the number of students per faculty has increased from 29 to 38 (Figure E.3.1). **When open education students are included, the number of students per academic staff and faculty increase to 70 and 101, respectively.** During the same period, the number of students per faculty at public and foundation universities increased from 48 to 56 and from 44 to 48, respectively. The number of students per academic staff at public and foundation universities, on the other hand, increased from 30 to 40 and 13 to 30, respectively (Figure E.3.4 and Figure E.3.5). **In terms of the number of students per faculty and academic staff, it can be seen that there is a significant difference between public and foundation universities.**

Comparing Turkey's number of students per academic staff with various countries, it can be seen that Turkey's rate is fairly high. There are 7 students per faculty in Japan, while there are 8 in Germany, 11 in Russia, 13 in the US, 16 in the UK, 20 in China and 21 in France. The OECD average is 17 students per faculty. While estimating the number of students per academic staff in OECD data, research assistants in Turkey, which are considered as ancillary staff were included. According to the estimations, there are 20 students per academic staff in Turkey, even though open education students are excluded and research assistants are included. This is significantly higher than the OECD average (17). **The high number of students per academic staff means that these academic staff need to dedicate more time to teaching and less time to research.**

There is a significant difference between cities in terms of number of students. There are 760,000 students in Istanbul at more than 50 universities, 302,000 in Ankara at 17 universities, 172,00 in İzmir at 8 universities and 135,000 in Konya at 4 universities. Meanwhile, there are less than 10,000 students in the following cities: Artvin, Sinop, Bayburt, Muş, Bitlis, Mardin, Kilis, Tunceli, Iğdır, Ardahan, Şırnak and Hakkari(Figure E.3.9). Regions with the highest number of students are the Aegean, Eastern Marmara, Western Anatolia, Mediterranean and Istanbul regions in descending order. Meanwhile, regions with the highest ratio of students to total population size are North-eastern Anatolia, Middle Anatolia, Western Black Sea, Eastern Black Sea, Western Marmara and the Eastern Marmara regions. On the other hand, South-eastern Anatolia, Istanbul and the Mediterranean regions have high rates of population per student; therefore, these regions have a low student density (Figure E.3.10). According to the data, 78% of foundation higher education institutions' stu-

dents are studying in Istanbul, while 11% are in Ankara, 4% in İzmir and 7% in various other cities (Gaziantep, Mersin, Trabzon, Konya, Nevşehir, Kayseri, Antalya and Bursa) (Figure E.3.11). Economic development, social facilities and the number of universities are some of the factors which affect the distribution of students across different cities. Moreover, while two thirds of foundation universities are concentrated in Istanbul, public universities are spread all across Turkey.

Another issue discussed in this section is campuses and green universities. This subject was analysed according to GreenMetric World University Ranking. Developed by University of Indonesia, there are 5 British, 3 American, 1 Dutch and 1 Austrian universities in the top ten. University of California Davis is in the first place. The most successful Turkish university on the list is Bülent Ecevit University, ranking 195th (Table E.4.1).

One of the most prominent aspects concerning access to higher education is housing. LDA dormitory capacities have improved significantly over time; dormitory capacities, especially for females, have continuously increased. With a swift rise, LDA dormitory capacity reached 552,000; around 350,000 of this capacity is dedicated to females, while the remaining 200,000 is dedicated to males (Figure E.5.1). The number of LDA dormitories increased from 199 to 682 between the years 2003-2016; similarly, the number of private dormitories rose from 728 to 1,666 (Figure E.5.3). **Despite the swift increase in LDA dormitory capacity, excluding open education students, only one in every seven students has access to these dormitories.** Transitioning from the bunk bed system to the mattress system has limited the number of students per dormitory. Moreover, capacities of LDA dormitories are disproportionate according to the population or the number of students in the city they are located in (Figure E.5.6).

CHAPTER E

RECOMMENDATIONS

- Considering the increasing demand for higher education in Turkey and the number of universities in various other countries, Turkey needs to increase its number of universities. For this reason, **new universities should be established in Turkey**. Moreover, instead of concentrating new universities in cities like Ankara and Istanbul, it would be more productive to place these universities in other cities deemed suitable in terms of economy, geography and transportation.
- The performance of faculties, departments, programs, research centres and similar units must be assessed. In this respect, successful units must be rewarded, while inefficient units should be improved or in some cases closed down.
- It can be seen that Turkey has a higher number of students per academic staff and faculty compared to OECD countries. For this reason, **new academic staff and faculty should be hired**. Furthermore, training programs for faculty both in Turkey and abroad must be effectively implemented.
- **Universities should be more proactive in the areas of energy and water conservation, waste recycling and in the facilitation of green transportation in order to achieve more sustainable and efficient usage of resources.**
- There have been significant improvements to dormitories in terms of capacity and comfort. This is a welcome development. However, it can be seen that many cities still have low dormitory admittance rates. For this reason, new dormitories should be built in cities with high demand. Moreover, policies aiming to improve the comfort of dormitories should be made widespread.

CHAPTER E

REFERENCES

Bülent Ecevit Üniversitesi. (2017). GreenMetric nedir? http://web.beun.edu.tr/greenmetrics/?page_id=28

Çetinsaya, G. (2014). *Büyüme, kalite, uluslararasılaşma: Türkiye yükseköğretimi için bir yol haritası* [Growth, quality, internationalization: A road map for Turkish higher education]. Eskişehir: Yükseköğretim Kurulu.

Eğitim-Bir-Sen. (2016). *Eğitime bakış 2016: İzleme ve değerlendirme raporu* [Outlook on Education 2016: Monitoring and evaluation report]. Ankara: Eğitimciler Birliği Sendikası.

Günay, D. ve Günay, A. (2011). 1933'ten günümüze Türk yükseköğretiminde niceliksel gelişmeler [Quantitative developments in Turkish higher education 1933 onwards]. *Yükseköğretim ve Bilim Dergisi*, 1(1), 1–22.

Gür, B. S. ve Çelik, Z. (2011). *YÖK'ün 30 yılı* [30 years of BHE] (Rapor No. 4). Ankara: Siyaset, Ekonomi ve Toplum Araştırmaları Vakfı.

Karataş Acer, E. ve Güçlü, N. (2017). Türkiye'de yükseköğretimin genişlemesi: Gerekçeler ve ortaya çıkan sorunlar [Higher education expansion in Turkey: Reasons and Issues]. *Yükseköğretim Dergisi*, 7 (1), 28-38.

OECD. (2016). *Education at a glance 2016: OECD indicators*. Paris: Organisation for Economic Co-operation and Development.

Özoğlu, M., Gür, B.S., & Gümüş, S. (2016). Rapid expansion of higher education in Turkey: The challenges of recently established public universities (2006-2013). *Higher Education Policy*, 29 (1), 21-39.

UNESCO. (2017). UNESCO Institute for Statistics. http://uis.unesco.org/en/home

University of Indonesia. (2017). GreenMetric world university ranking. http://greenmetric.ui.ac.id/overall-ranking-2016/

Webometrics. (2017). Countries arranged by number of universities in top ranks. http://www.webometrics.info/en/node/54

CHAPTER F

THE FINANCING OF HIGHER EDUCATION

This chapter examines the total public expenditure on higher education in Turkey, the ratio of this expenditure within the government budget and Gross Domestic Product (GDP), trends in allocated public resources for higher education, expenditure per student, the types of expenditures of higher education institutions and the scholarships and loans that the Credit and Dormitories Agency (LDA) provides to students.

Higher education is one of the most intensively emphasized sectors in the most developed countries of the world. Countries are looking for ways to improve higher education in order to address the needs of society and of a knowledge-based economy. Access to higher education is increasing all around the world and it is becoming popularized. As a consequence of this development, the resource requirement of higher education is also increasing in various countries. Although the resources that states have allocated for higher education has increased significantly, this increase is not sufficient to offset the increase in the number of students (OECD, 2017). Therefore, there arises a problem in which the resource requirement of the higher education system surpasses the capacity of the state. In this context, it is being suggested that the share of higher education expenditures in the government budget should be increased, but it is also suggested that universities diversify their financial resources and that private higher education institutions be made more prominent (BHE, 2007; Boer, Jongbloed, Enders and File, 2010; Eurydice, 2016; TÜSİAD, 2003; World Bank, 2007). Alongside the issue of providing the higher education system with the resources it needs, the issues of making sure that these resources are used efficiently and establishing a fair structure that allows all segments of society to access higher education are also important (Kurt and Gümüş, 2016). The financing of higher education is particularly important for Turkey because the Turkish higher education system is one of the most rapidly developing in the world.

Countries invest in their educational institutions in order to promote economic growth, increase efficiency, contribute to their population's personal and social development and reduce social inequality. Compulsory levels of education, that is primary and secondary education, at public institutions are being financed by the state towards this end. At the higher education level, individual's personal and family funds are also utilized. It is stated that since higher education provides individuals with benefits such as finding a job faster than graduates with lower levels of education, earning a higher income and faster promotion, that a fraction of the cost of education should be shouldered by the individuals receiving this education (EURYDICE, 2017; Johnstone and Marucci, 2007; Psacharopoulos, 2009). However, as is the case of Turkey, higher education around the world is largely financed by public funds (Altbach, Reisberg and Rumberly 2009; BHE, 2007; Çetinsaya 2014; OECD, 2016). Just as health, social security and defence spending, education spending is also financed by the state. However, the degree to which higher education expenditure is financed by the state differs between countries. Education expenditures, which are referred to as public expenditures encompass current and capital expenditures at all levels of government (central, regional and local) directed towards education. Government education expenditures can be directed towards educational institutions directly or they can be directed towards households (for example, scholarships and loans for students to help them pay their tuition fees and living expenses) and towards private institutions

which provide educational services. The expenditure levels of educational institutions are related to the size of the student age population, registration rates, levels of personnel salaries, regulations and the way education is provided (OECD, 2016).

The global financial crisis that began in 2008 negatively impacted various public services such as education. In analyses conducted by the OECD (2016), the negative impacts of the economic crisis on education expenditures can be clearly observed when the 2008-2010 and 2010-2013 periods are compared. It is stated that during crisis periods the governments of most OECD countries try to preserve the allocated resources for higher education. Since educational investments are considered important for sustained economic growth and preserving the quality of education, many countries try to preserve the resources allocated to higher education. In the period of the 2008 economic crisis, many OECD countries (Germany, Norway, Japan) preserved the funds allocated to higher education while in some countries (Italy, Hungary, Estonia, and the Russian Federation) these funds declined (OECD, 2016). The higher education expenditures in Turkey on the other hand have constantly increased.

The indicators concerning the financing of higher education in Turkey and OECD countries have been presented and discussed within the framework provided above.

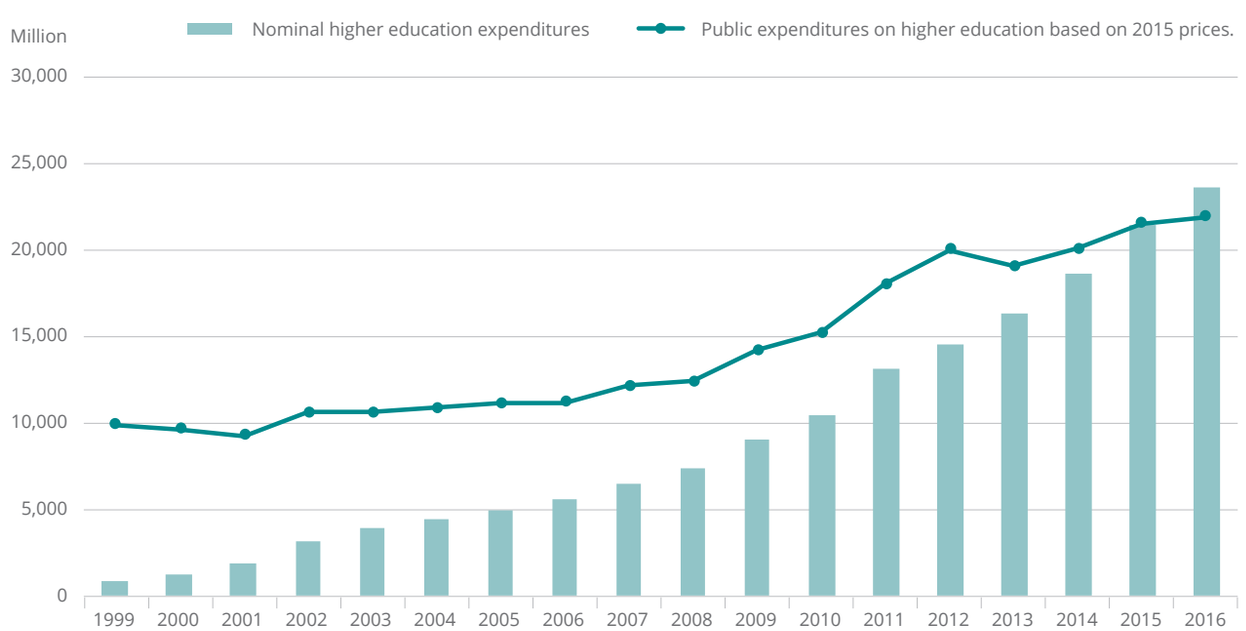
INDICATOR F1

THE BUDGET ALLOCATED TO HIGHER EDUCATION

In Turkey and around the world the largest share in the financing of higher education is provided by the state and the state plays the most important role in the provision of higher education. The individual benefits (finding a job faster, higher salaries and better promotion opportunities and career advancement) of higher education are better compared to those of lower level education (primary, secondary). Therefore, higher education is considered as a semi-public good (Psacharopoulos and Woodhall, 1985). Furthermore, there are significant social benefits produced by higher education (higher tax revenues due to higher salaries, higher rates of literacy, potential to produce high value-added products). Therefore, although higher education is considered as semi-public, higher education services continue to be provided by the public sector. This indicator examines the share of higher education within the central budgets of OECD countries and the ratio of education expenditures according to GDP.

Figure F.1.1 shows the trends in nominal public spending between the years 1999 and 2016 and the trends in higher education expenditure in terms of fixed 2015 prices. The direct comparison of each year's expenditures does not reveal accurate trends in expenditures because of reasons like inflation. Therefore, the higher education expenditures in the 1999-2016 period were re-calculated based on 2015. As a result, the real trends in the share of higher education expenditures within public expenditures have been determined. According to the figure, public expenditures on education have constantly increased over the years. While public expenditures totaled 830 million TL in 1999, this number surpassed 23 billion TL in 2016. When this expenditure increase is reconsidered with the fixed prices of 2015, the expenditure of 9.8 billion TL has increased to 21.9 billion TL in 2016. **This shows that during the 1999-2016 period Turkey's public higher education expenditures more than doubled in real terms.** The highest

Figure F.1.1 Trends in public expenditures for higher education in Turkey (1999-2016)



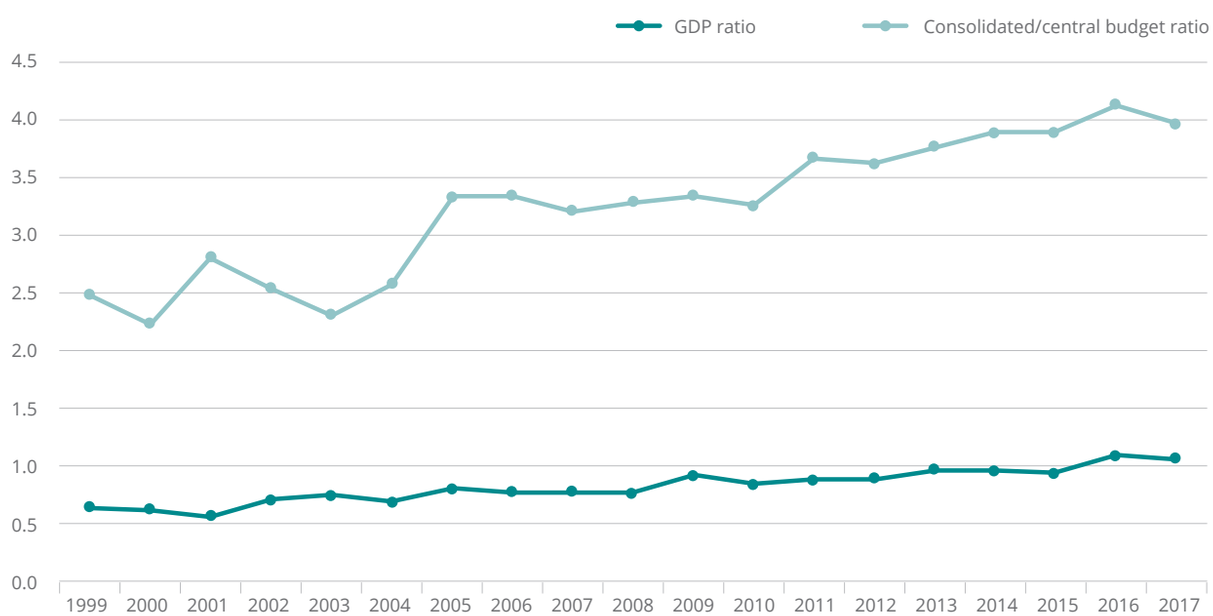
Source: Compiled using MONE statistics published in various years.

increase of the state's higher education expenditure took place between 2008-2012. The demand for new resources after the establishment of new universities in Turkey from 2006 onwards led to significant increases in the state's higher education expenditures. In the 1999-2001 and 2012-2013 periods, the higher education expenditures of the state declined slightly in terms of fixed prices. The economic crises that took place in Turkey in the 1999-2001 period led to diminishing resources for education spending. It is also considered that the extension of compulsory education to 12 years in 2012 also negatively impacted the resources allocated to higher education.

Figure F.1.2 shows the trends in the ratio of the higher education budget to the consolidated/central budget and the ratio to the GDP in the 1999-2017 period. The share of higher education within the central budget has tended to increase over the period of 1999-2016. While the share of the higher education budget within the central budget was 2.2% in 1999, this ratio increased to 4.1% in 2016. **In other words, the share of higher education within the central budget has almost doubled in the last 18 years.** This share declined following the 2001 economic crisis in 2002 and 2003 and also in 2010 following the global economic crisis. Excluding these years, **the higher education budget has constantly increased since 1999. Moreover, the share of higher education within the central budget has increased significantly especially after 2010.** The share of the higher education budget within the total education budget, on the other hand, has not changed significantly and has remained at the 25% level. Therefore, parallel to the increase in the general education budget the higher education budget has increased significantly. It is possible to say that the share of the higher education budget within the central administration budget has increased significantly considering that the share of the total education budget within the central budget has increased from 10% to 17% over the last 10 years.

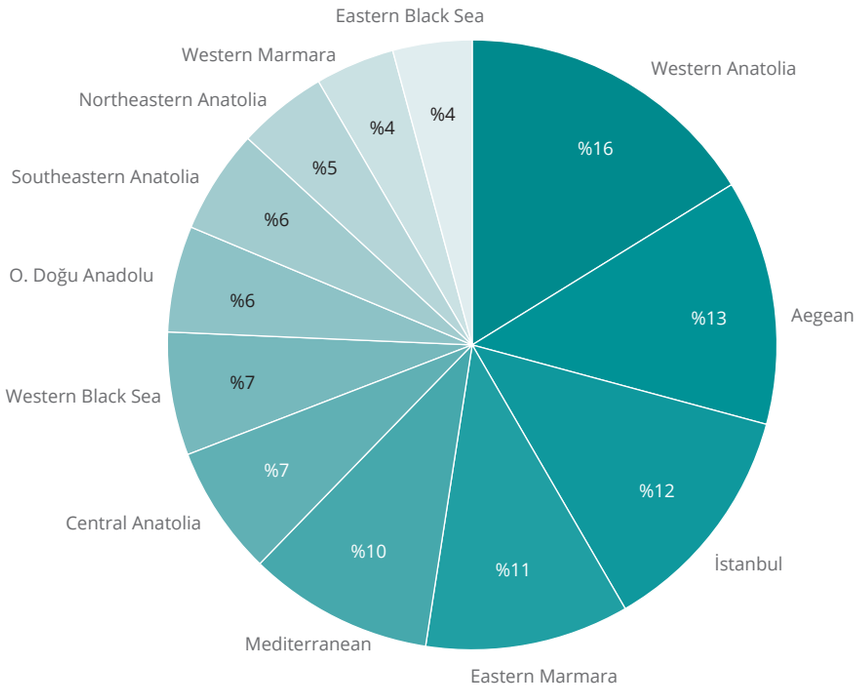
It can also be observed that the ratio of the higher education budget according to GDP has also been increasing (Figure F.1.2). While the ratio of the higher education budget to GDP was around 0,6%, this increased to 1.1% in 2017. These ratios demonstrate that the share of high-

Figure F.1.2 Trends in the ratio of higher education budget to the consolidated/central budget and the ratio to GDP (1999-2017)



Source: Compiled using MONE statistics published in various years.

Figure F.1.3 Proportional distribution of the higher education budget according to the region the university is located in (2017)

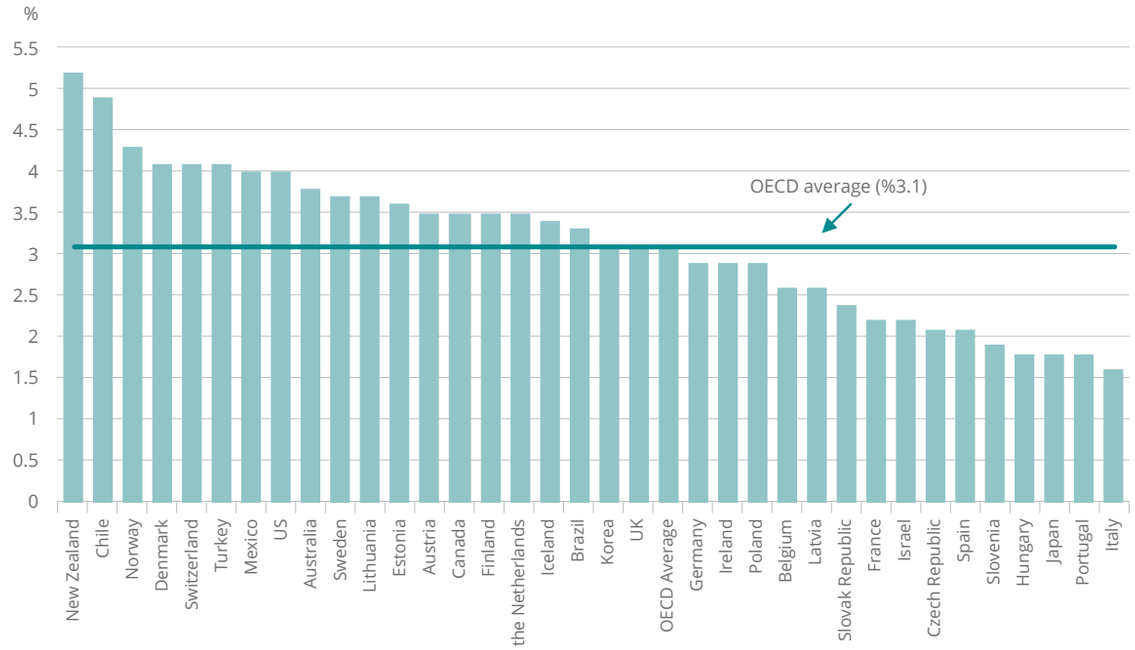


Source: Compiled using MONE statistics on the 2016-2017 academic year.

er education expenditures within GDP has increased. **The share of higher education within GDP has doubled in the 1999-2017 period.** While the lowest higher education budget to GDP ratio was 0.6% in 2001, the highest was reached in 2016 with 1.,1%. Although higher education's share within GDP has been increasing in Turkey, it remained below the average of OECD countries for a long time. **However, higher education's share within GDP in Turkey surpassed the OECD average in 2013** (see Figure F.1.5). The increase in the number of universities particularly after 2006 and the abolishment of tuition fees at public universities are just some of the factors that catalyzed this increase.

Figure F.1.3 shows the proportional distribution of the 2017 higher education budget according to the region the university is located in. This distribution was based on 12 regions based on the nomenclature of territorial units for statistics level 1 (İBBS1). As figure F.1.3 indicates, the region with the highest public expenditure on higher education is Western Anatolia. The regions of the Aegean, İstanbul, Eastern Marmara and Mediterranean are the areas which received the highest shares from the central higher education budget. The Eastern Black Sea, Western Marmara, Northeastern Anatolia are the regions which receive the least. **The regions in which higher education expenditures are the highest are also the regions where the number of students is also the highest.** Therefore, it can be said that one of the main reason behind the differentiation between regions is the different number of students. On the other hand, the reason behind some regions receiving significant shares of the higher education budget is that the universities in these regions are newly established and thus require high investment expenditures to get them started.

Figure F.1.4 Share of higher education expenditures within total public expenditures for OECD countries (2013) (%)

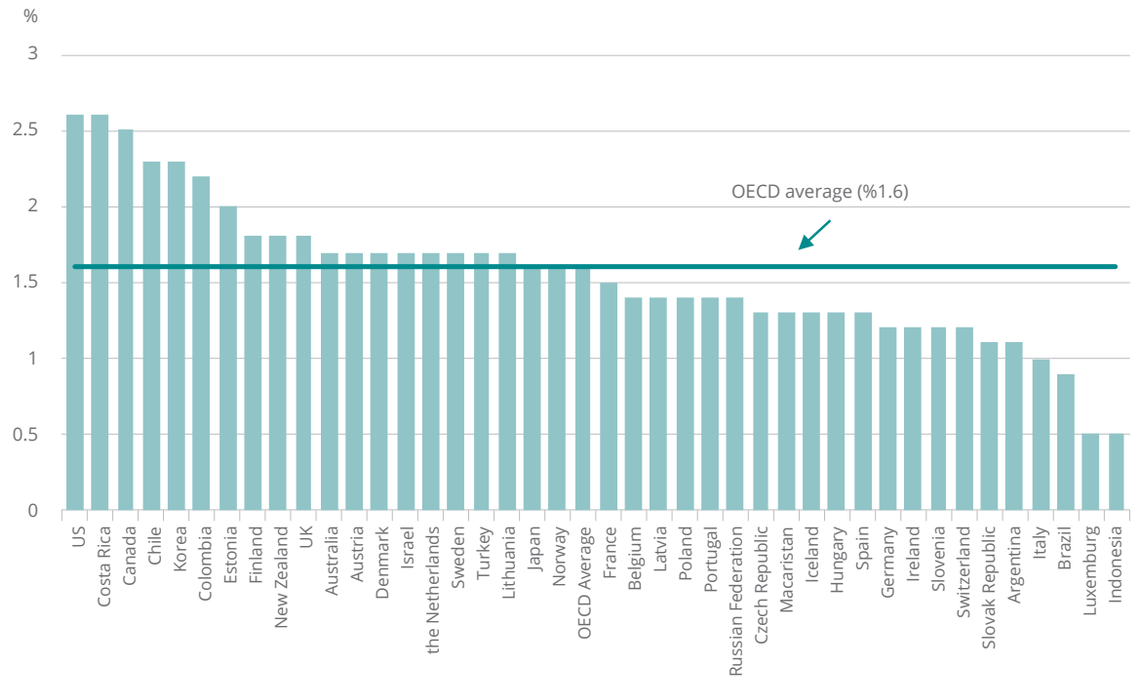


Source: OECD (2016).

Figure F.1.4 shows the share of higher education expenditures within total public expenditures for OECD countries for 2013. The average share of higher education expenditures within total public expenditures is 3,1%. According to the figure, Turkey's share is above the OECD average with 3,35%. As of 2017, the share of higher education expenditures within total public expenditures is 4%. In other words, **Turkey allocates a larger share of public expenditure to higher education compared to many OECD countries.** According to OECD analyses, the percentage of higher education expenditures within total public expenditures declined in 19 out of 27 countries in the years 2005 and 2013 (OECD, 2016). There is an opposite trend in Turkey. **In Turkey, there was an increase in the public financing of higher education.**

Figure F.1.5 shows the shares of higher education expenditures within the GDP in OECD countries. This figure aims to demonstrate a country's expenditure on its educational institutions compared to its wealth. National wealth is estimated according to GDP and education expenditures encompass the expenditures of governments, private legal entities, and individual students and their families (OECD, 2016). While the average ratio of higher education expenditures according to GDP among OECD countries is 1.4%, this ratio is 1.7% for Turkey. Therefore, **in Turkey higher education's monetary share of the national GDP has surpassed the OECD average.** The countries that have the highest higher education expenditure according to GDP ratios are the U.S (2.6%), Costa Rica (2.6%) and Canada (2.5%) and the countries with the lowest ratios are Indonesia (0.5%), Luxemburg (0.5%) and Brazil (0.9%). Turkey has made significant progress in terms of the higher education expenditures to GDP ratio and has ranked 16th among 42 countries. This presents a different situation from expenditures at all other educational levels. When

Figure F.1.5 Shares of higher education expenditures within GDP for OECD countries (2013) (%)



Source: OECD (2016).
Not: OECD partner countries were also included.

all education levels are considered (primary, secondary, higher education), Turkey's higher education to GDP ratio is below the OECD average. However, as indicated above, when higher education expenditures alone are considered, the figure is above the OECD average.

There are two main reasons behind the fact that Turkey has a better higher education expenditure to GDP ratio than the OECD average. The first reason is the increase in individual and household expenditures due to the increase of students studying in private universities. The second reason is the increase in state resources allocated to higher education. The higher education expenditures in Turkey are still largely financed through public funds. In addition, the private expenditures of individuals and institutions on higher education have also been increasing. Furthermore, in most OECD countries public universities also charge tuition fees just as private universities do. Due to the share of private universities in the higher education sector and the fact that higher education is provided with relatively high fees at both public and private institutions, the share of higher education within the GDP is larger in these countries. In Turkey on the other hand, public universities are tuition free and the number of students at foundation universities is lower than other OECD countries. Therefore, the fact that higher education's share within the GDP is still high regardless shows that the schooling rates in higher education and the total number of students in Turkey are increasing.

INDICATOR F2

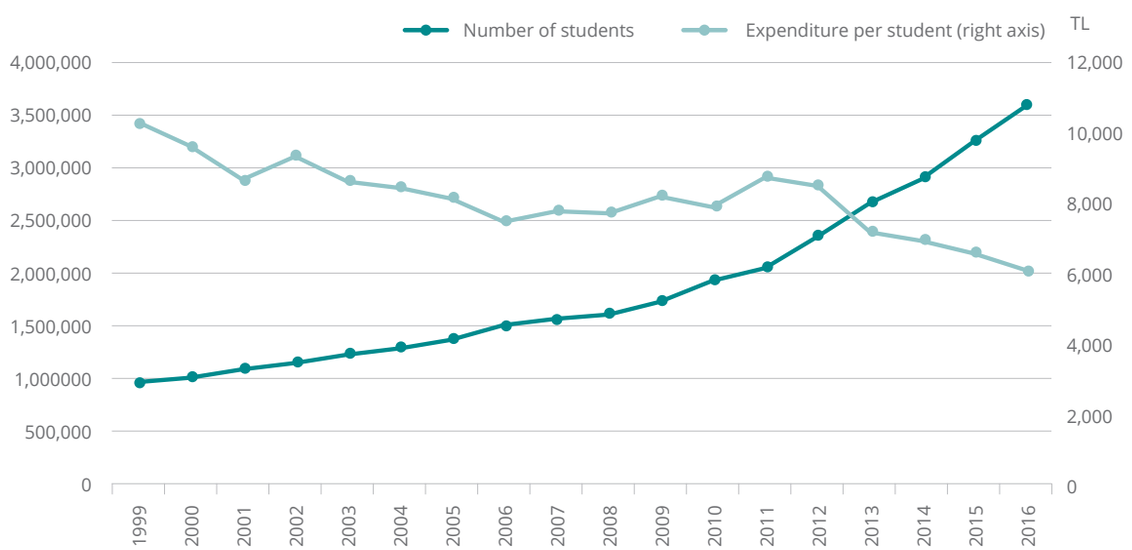
EXPENDITURE PER STUDENT

Expenditure per student is considered as an important factor in relation to the quality of education systems. The number of students registered in the education system, teacher salaries, teaching load, teaching materials, costs of facilities, program type (for example, general or vocational) are all elements that determine an institution's expenditure per student. Efforts for promoting the vocation of teaching, reducing the number of student per classroom and teacher, and improving research and development services also determine expenditure per student (OECD, 2016). It is important to provide opportunities in universities beyond education and research. Improving the quality of food, health and housing services and providing the opportunity to participate in volunteering activities are just some examples (OECD, 2017). When it is considered that all these opportunities are related to the expenditure per student, it can be stated that increasing expenditures is crucial when it comes to improving student satisfaction.

Although higher education expenditures are generally increasing in OECD countries, these increases have not been reflected in expenditure per student rates. In fact, in some countries expenditure per student has declined. The number of students has increased in most OECD countries. However, the increase in students in OECD countries is related to increased access to higher education rather than demographic factors. In general, expenditure per student has increased 12% over the period of 2005-2013. The primary challenge here has been to increase expenditure per student in order to maintain education quality while increasing access to higher education. This challenge is particularly profound for Turkey because the higher education system is going through a phase of rapid growth and it is projected that this trend will continue (see **Chapter A. Transition to Higher Education**).

Figure F.2.1 shows the trends in the number of students in higher education and expenditure per student be-

Figure F.2.1 Trends in the number of students in higher education and expenditure per student (1999-2016)



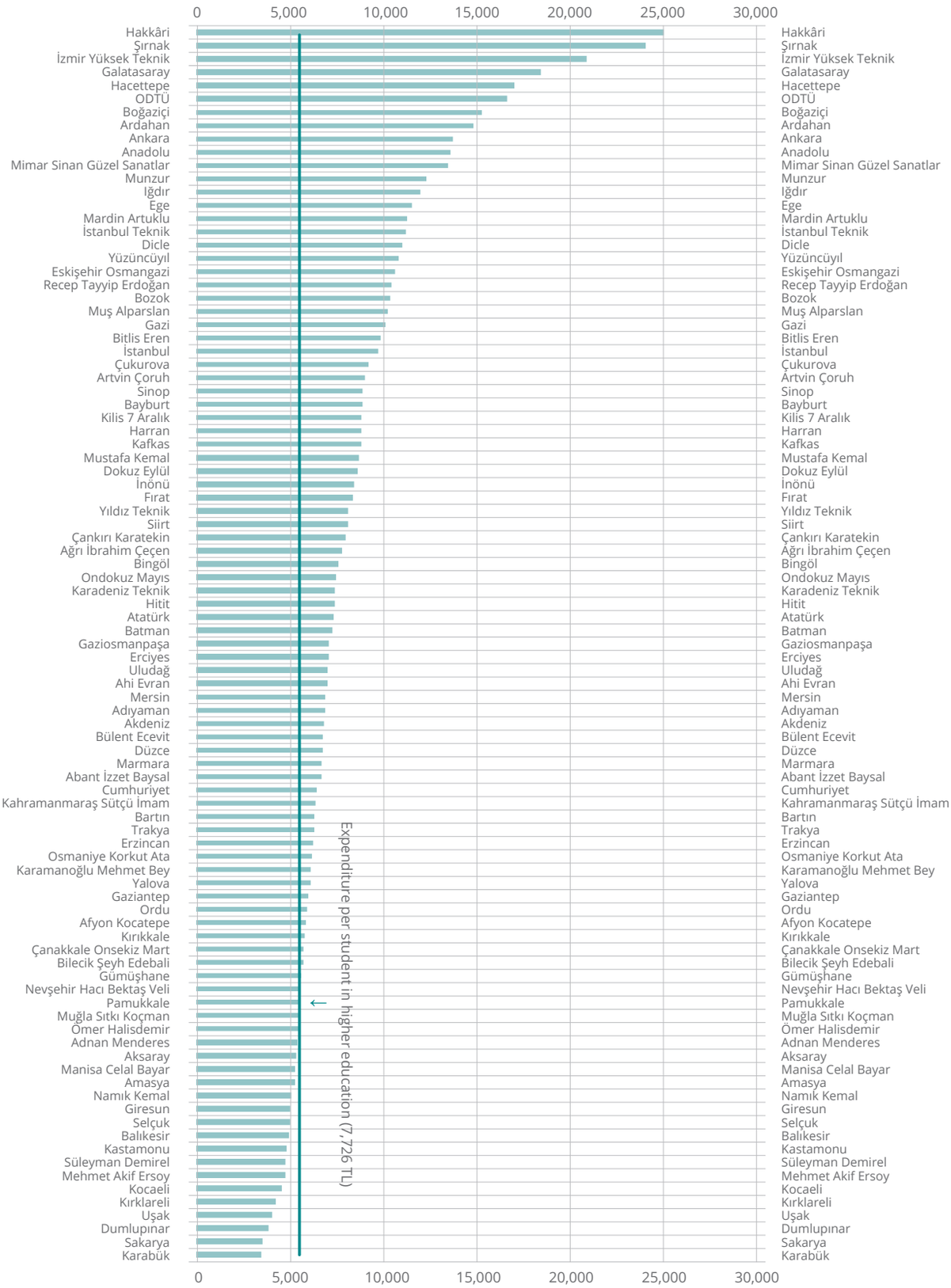
Source: Compiled using Higher Education Management System and ÖSYM data. Expenditure per student was calculated using data provided by the Ministry of Finance.
Note: Open education students have been excluded from the calculation. For estimating expenditure per student, budget allocations were re-calculated based on 2015.

tween 1999 and 2016. As the figure indicates, the number of students receiving a face-to-face higher education in Turkey increased constantly in the period of 1999-2016. While there were 953,243 students in 1999, this number reached 1,5 million students in 2006. The number of students in public universities reached 3,611,406 in the 2016-2017 academic year. While the total public expenditure according to 2015 prices was around 9.8 billion TL in 1999, this reached around 22 billion TL in 2016. Although the funds allocated from the central budget have steadily increased, this has not been reflected in expenditure per student because the increase in the number of students has been higher. **While the expenditure per student was 10,315 TL based on 2015 prices in 1999, expenditure per student fell to 6,061 TL in 2016.**

Figure F.2.2 shows university expenditures per student according to the number of students in the 2016-2017 academic year and according to the 2017 higher education budget. The funds allocated to universities differ significantly according to the investment funds allocated for that year. Therefore, the ranking provided in the figure is only valid for the 2016-2017 academic year. Moreover, universities established after 2010 were excluded from this figure. The number of students at some of these universities is very low and their budgets mainly consist of investment expenditures. Since these high investment expenditures would not be reflected on the total annual expenditure per student, universities established after 2010 were left out of this analysis. **According to the 2017 higher education budget the average expenditure per student at universities is 7,726 TL.** The universities with the highest expenditures per student which are Hakkari University, Şırnak University, İzmir Institute of Technology, Istanbul Civilization University, have expenditures per student that vary between 20 and 25 thousand TL. Since Hakkari and Şırnak universities were established recently and therefore have large infrastructure investments and a low number of students, the expenditures per student appear to be high. **The three long established universities with the highest expenditures per student are Hacettepe University, METU and Boğaziçi University.** The expenditure per student at these three universities is over 15 thousand TL. Ankara, Anadolu, Ege, İstanbul, Dicle, Yüzüncü Yıl are other long-standing universities which have expenditures per student over 10 thousand TL. Therefore, setting aside investment budgets, **it can be observed that the number of students is not considered when allocating budgets to universities and that for some universities there is a higher expenditure per student.**

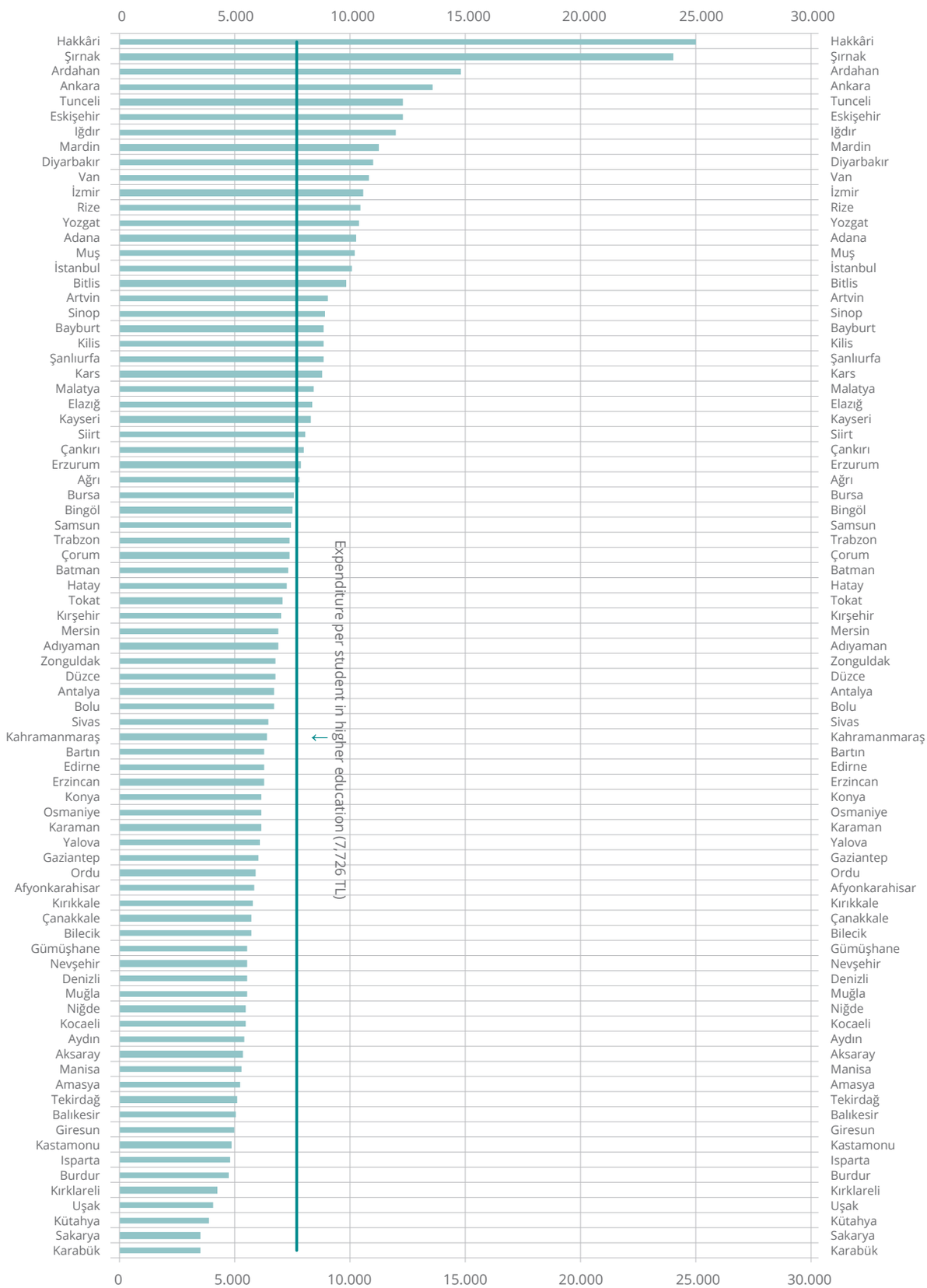
According to the number of students in the 2016-2017 academic year and the 2017 higher education budget, the provinces with the highest expenditures per student are Hakkari, Şırnak, Ardahan, Ankara, Tunceli, Eskişehir, Iğdır, Mardin, Diyarbakır, Van İzmir, Yozgat, Adana and Muş (Figure F.2.3). Except for Ankara, Eskişehir, İzmir, Yozgat and Adana, the newly established universities are all in the regions of Eastern or Southeastern Anatolia. Since the number of students is low in many of the newly established universities in Eastern and Southeastern Anatolia, the investment expenditures appear to be high. The provinces with the highest expenditures per student such as Ankara, Eskişehir, İzmir and Adana are also the provinces with the largest number of universities and students. The fact that expenditure per student is the highest in these provinces despite the high number of students shows that the universities in these provinces receive a large share of the higher education budget. Nevertheless, new universities have been established in all of these provinces except Eskişehir. Therefore, it can be said that investment funds allocated to these new universities have also contributed significantly to the high expenditures per student in these provinces. On the other hand, the provinces with the lowest expenditures per student are Karabük, Kırıkkale, Burdur, Isparta, Kastamonu and Giresun. New universities have also been established in these provinces. However, the expenditure per student in these provinces is below 5 thousand TL.

Figure F.2.2 Expenditure per student by university (TL) (2016)



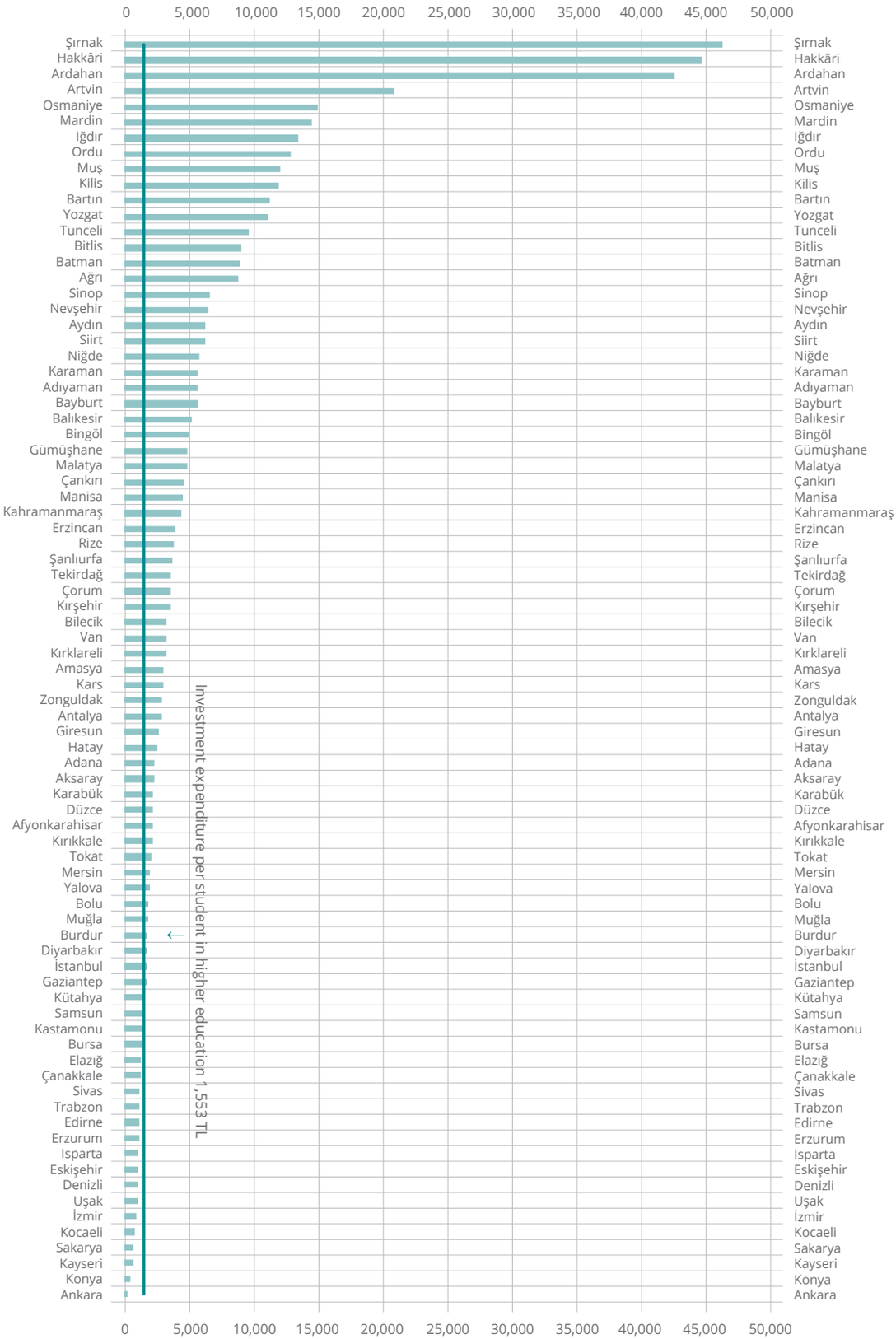
Source: Compiled using Higher Education Information Management System and MONE statistics

Figure F.2.3 Expenditure per student in higher education by province (TL) (2016)



Source: Compiled using Higher Education Information Management System and MONE statistics

Figure F.2.4 Investment expenditure per student by province (TL) (2016)

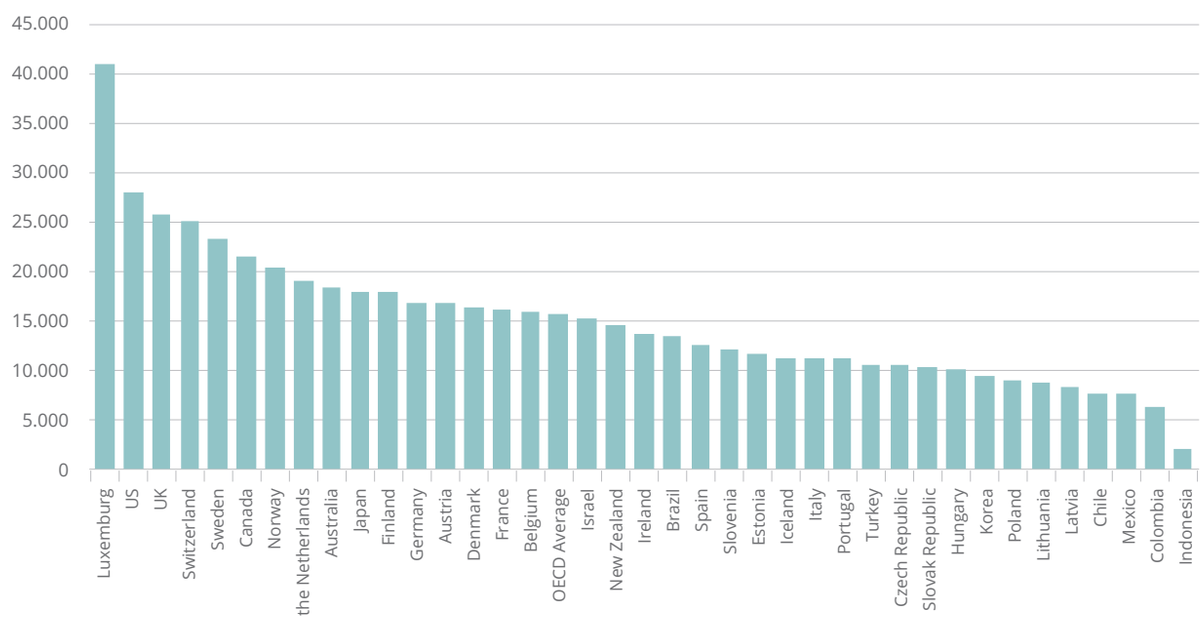


Source: Compiled using Higher Education Information Management System and MONE statistics

When the investment expenditures according to province, based on the number of students for the 2016-2017 academic year and the 2017 budget data are considered, it can be observed that the expenditures per student and investment expenditures are quite close for universities (Figure F.2.4). Expenditure per student seem to be higher in provinces in the Eastern and South-eastern Anatolia regions where new universities have been established. However, the reason for the high investment expenditures per student in these provinces is that the number of students in these universities is low. On the other hand, the provinces with the lowest investment expenditures per student are Ankara and Konya. Nevertheless, METU, Hacettepe and Yıldırım Beyazıt universities in Ankara have the highest expenditures per student.

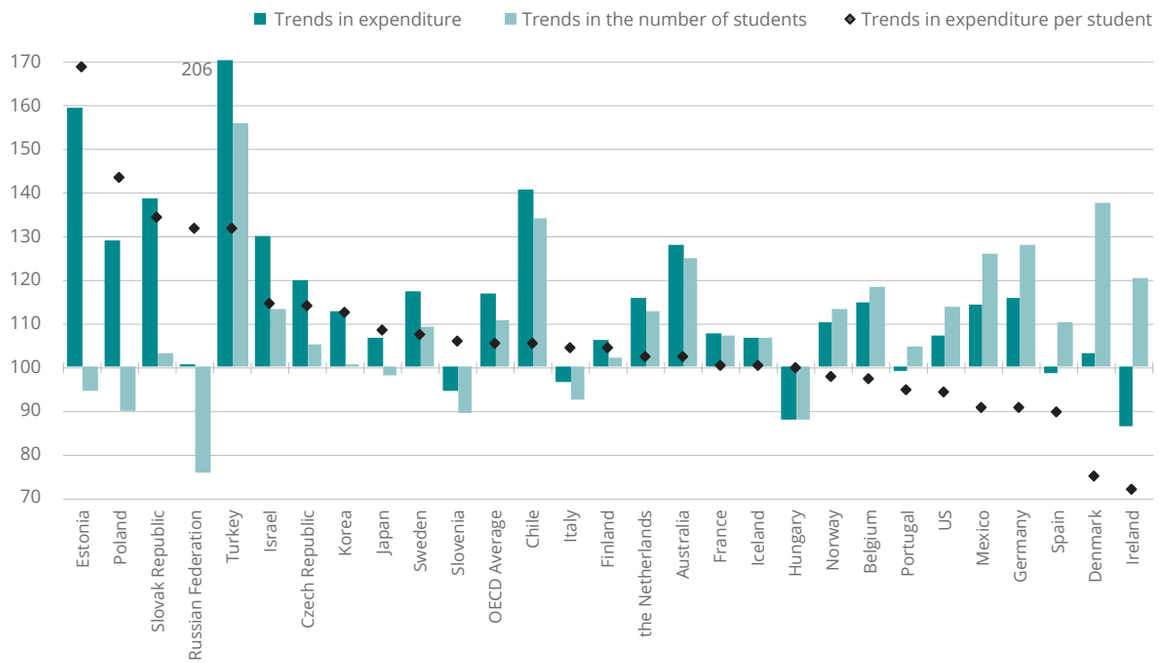
Figure F.2.5 shows the annual expenditure per student for all services in OECD countries according to 2013 data. The average expenditure for higher education students in OECD countries according to purchasing power parity is $15.772. Expenditure per student is $27,924 in the U.S, $25,744 in the U.K, $25,126 in Switzerland, $23,219 in Sweden and $21,458 in Canada. Turkey's expenditure per higher education student is $10.637. Turkey ranks 28th among the 39 countries compared. This amount shows that expenditure per higher education student is lower than OECD country averages. Although Turkey is above the OECD average in terms of the share allocated from public funds towards higher education and the share allocated from the GDP, it is below the OECD average in terms of expenditure per student. The main reason for this is that Turkey's income level is lower and the higher education system is growing faster than the allocated budget.

Figure F.2.5 Annual higher education expenditure per student for all services in OECD countries ($) (2013)



Source: OECD (2016)
Note: Expenditures were calculated according to purchasing power parity.

Figure F.2.6 Trends in the higher education expenditures, number of higher education students, and the expenditure per student for OECD countries (2008, 2013)



Source: OECD (2016)
Note: The change index for the 2008-2013 period has been used (Year 2008 =100, 2013 fixed price). OECD partner countries have also been shown.

Figure F.2.6 shows the trends in the higher education expenditures, number of higher education students, and the expenditure per student for OECD countries over the period of 2008-2013. **Turkey's higher education expenditure and its number of higher education students increased the most of all 28 countries compared.** According to the OECD calculations, Turkey's higher education expenditures reached 206%, students in higher education reached 156% and expenditure per student reached 132%. Countries in which expenditure per student increased the most are Estonia (169%), Poland (143%), Slovak Republic (134%), Turkey and the Russian Federation (132 %). During the same period Ireland (72%), Denmark (75%), Spain (89%), Germany (90%) and Mexico (91%) are the countries that experienced a decline in expenditure per student. In the 2008-2013 period, the number of students declined in countries such as Estonia and Poland, which experienced the highest increase in expenditure per student. The decline in the number of students has been considered as the most important factor in the expenditure per student going up for these countries (OECD, 2016). The situation in Turkey is the opposite. Expenditure per student is going down because the increase in higher education expenditure is not enough to offset the increase in the number of students.

INDICATOR F3

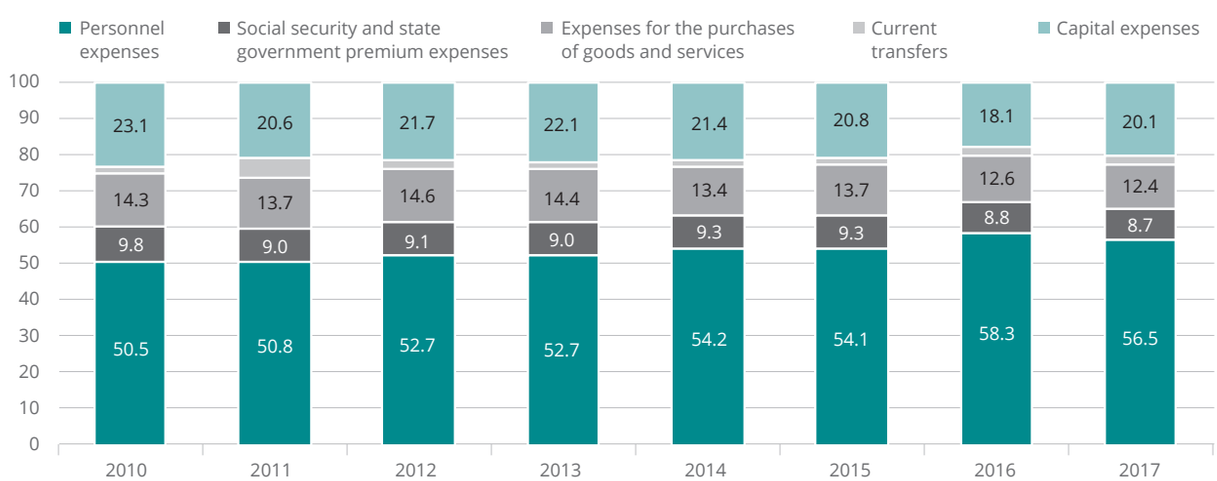
BUDGET DISTRIBUTION BY ECONOMIC CLASSIFICATION

This indicator demonstrates the fields to which higher education expenditures are directed. Higher education expenditures are examined in three parts including public expenditures on education, investment (capital) expenditures, current and transfer expenditures. Investment expenditures are made up of expenditures like building schools, laboratories in schools and purchasing machines and vehicles. The expenditures in this group are directed towards investments that produce returns after more than a year and are related to increasing educational capacity and long-term sustainability. Current expenditures consist of expenditures that take place in a certain fiscal period and consist of employee salaries, office supply purchases, electricity, water costs, health services. These expenditures take place in order to purchase the goods and services that are necessary to utilize the existing production capacity of the education system. Transfer expenditures are expenditures in which monetary resources that are not used in current nor investment expenditures are transferred to certain institutions. These institutions are state economic enterprises, local governments and annexed budget departments. Expenditures such as boarding schools, scholarship grants, and lunch per diems for civil servants are examples of transfer expenditures. Transfer expenditures play an important role in terms of equality of opportunity and social cohesion because they transfer purchasing power between private individuals or social strata (Eğitim-Bir-Sen, 2016; OECD, 2015, 2016).

Identifying the difference between current and capital expenditures is important in terms of analysing education expenditures. In this context, it is stated that according to the trends in the world, higher education expenditures are mostly directed towards the construction of new buildings in order to meet the needs of the increasing number of students. Current expenditures on the other hand mostly consist of the number of academic staff and their salaries. In addition to this, higher education institutions not only provide education, but they also provide services such as dining, housing and research (OECD, 2016). Therefore, investment and current expenditures require attention because they have numerous outputs such as the education that students receive, services for students, and social justice. In this context, this indicator provides analysis of university expenditures according to their type.

Figure F.3.1 shows the trends in the distribution of the higher education budget by economic classification in the 2010-2017 period. According to the figure, the largest

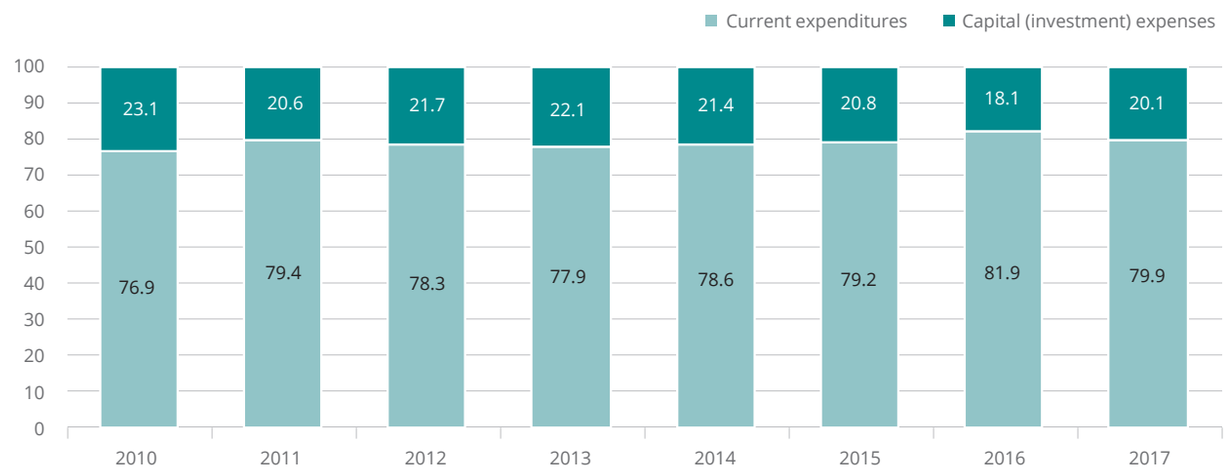
Figure F.3.1 Trends in the distribution of the higher education budget by economic classification (2010-2017)



Source: Compiled using MONE statistics published in various years

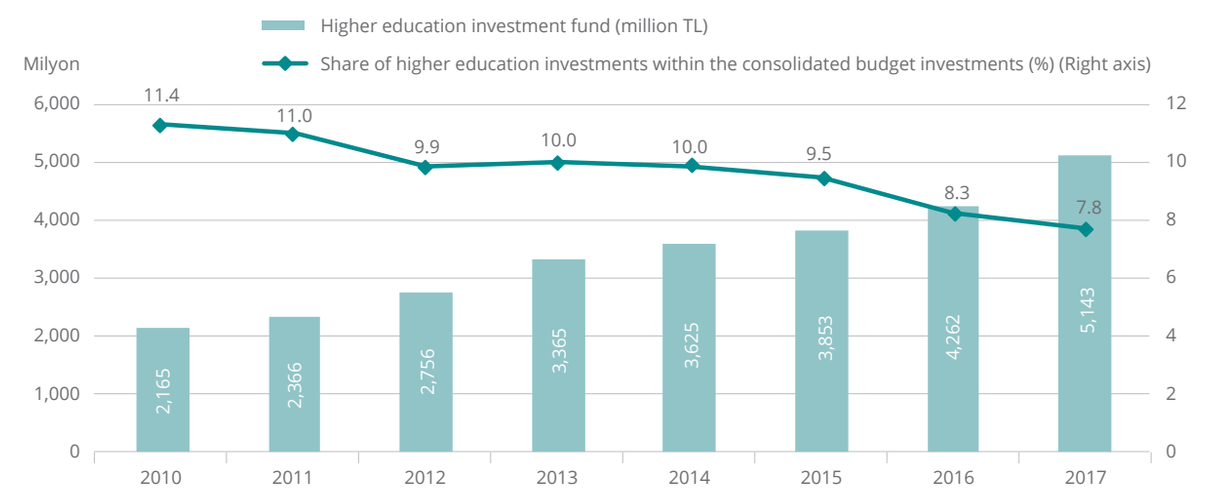
share of the higher education expenditures derives from personnel expenses. More than half of the higher education budget is allocated to personnel salaries and other personnel expenses. While the portion of the higher education budget allocated to personnel expenses was 50.,5% at the beginning of this period, this share increased to 58.3% in 2016. The largest expenditure following personnel expenses were capital expenses and the purchasing of goods and services. Expenditures in the capital expenses group are related to merchandise purchases, real estate capital production expenses (new buildings and extensive renovations of classrooms). While the share of capital expenses within the higher education budget was 23.1% in 2010, this number was 20.1% in 2017. Expenditure for the purchase of goods and services was 14.3% in 2010 and 12.4% in 2017. Social security and government premium expenses declined to 8.7% from 9.8% between 2010 and 2017. The share allocated to current expenditures encompassing transfers to non-profit institutions, households, abroad, payments to state and government sponsored

Figure F.3.2 Trends in the distribution of current and capital (investment) expenses within the higher education budget (2010-2017)



Source: Compiled using MONE statistics published in various years

Figure F.3.3 Trends in the higher education investment fund and the share of higher education investments within the consolidated budget investments (2010-2017)



Source: Compiled using MONE statistics published in various years

students has been around the 2% level between 2010 and 2017. **There has been a decline in the establishment of new universities since 2010 and this led to a decline in the share of capital expenses within the budget while personnel expenses increased due to the increase in the number of personnel working in the higher education sector.**

Figure F.3.2 shows the trends in the distribution of current and capital (investment) expenses within the higher education budget in the 2010-2017 period. According to the figure, the share of current expenses is much larger than capital expenses. Around 80% of the higher education budget has been spent on current expenses while 20% was spent on capital expenses. However, since 63% of current expenses consist of salaries and other personnel expenses, **it is difficult to say that universities have enough current spending power.** Current expenditures on average make up 20% of the higher education budget. Current expenditures excluding personnel expenses are related to education, research, and other campus services (dining, housing, social facilities, cultural activities etc).

Figure F.3.3 shows the trends in the higher education investment fund and the share of higher education investments within consolidated budget investments. According to the figure, the investment expenditures for the higher education budget have increased from 2 billion 165 million to 5 billion 143 million in the period between 2010 and 2017. On the other hand, the investment fund within the consolidated budget has declined from 11.4% to 7.8%. Although investment funds have continued to increase following 2010, the share of higher education investment budgets within the consolidated investment budgets is declining. **While the total investment budget is growing due to the increase in the total higher education budget, the share allocated to investments within the consolidated budget is declining.**

Table F.3.4 shows the distribution of current and capital (investment) higher education expenditures in OECD countries according to 2009 data. According to the figure, 89% of higher education expenditures in OECD countries are current expenditures while 11% are capital expenditures. 82% of higher education expenditures in Turkey are current expenditures and 18% are capital expenditures. **The share of capital expenses within total expenses in Turkey is higher than most OECD countries.** The main reason for this is that Turkish higher education is going through a growth phase and as a result there are significant infrastructure expenses in the higher education system particularly in the newly established universities (OECD, 2010). The observed increase in capital expenses is important for higher education institutions to strengthen their infrastructures and hence improve their quality and efficiency. However, the high capital expenses of Turkish universities lead to a lower share of current expenditures for universities in comparison to other OECD countries.

Table F.3.4 Current and capital expenditures in higher education in OECD countries (2009)

Countries	Distribution of higher education expenses (%)		Distribution of higher education current expenses(%)			Other current expenditures
	Current	Capital	Academic staff	Non-academic staff personnel expenses	Total	
Australia	87	13	34	29	63	37
US	90	10	30	36	65	35
Germany	91	9			66	34
Austria	93	7	60	5	65	35
Belgium	96	4	50	29	79	21
UK	94	6	36	28	64	36
Czech Republic	91	9	29	21	50	50
Denmark	97	3			78	22
Estonia	82	18	44	17	61	39
Finland	97	3	34	29	63	37
France	91	9	40	39	79	21
the Netherlands	89	11			72	28
Ireland	93	7	44	26	70	28
Spain	87	13	53	20	74	26
Israel	93	7			69	31
Sweden	97	3			65	35
Switzerland	91	9	49	27	76	24
Italy	86	14	39	23	62	38
Iceland	96	4	43	28	71	29
Japan	84	16			59	41
Canada	92	8	38	28	66	34
Korea	86	14	38	21	59	41
Latvia	83	17			65	35
Luxemburg	74	26	18	50	68	32
Hungary	89	11			54	46
Mexico	91	9	57	15	72	28
Norway	93	7			69	31
Poland	86	14			76	24
Portugal	94	6	70	0	70	30
Slovak Republic	83	17	30	22	52	48
Slovenia	83	17			72	28
Turkey	**82**	**18**			**63**	**37**
OECD Average	**89**	**11**	**42**	**25**	**67**	**33**
Partner countries						
Argentina	97	3	66	31	98	2
Brazil	91	9			80	20
Indonesia	80	20			31	69
Lithuania	78	22	33	32	65	35
Russian Federation	86	14			64	36

Source: OECD (2016)

INDICATOR F4

THE FINANCIAL RESOURCES OF HIGHER EDUCATION

This indicator examines the public and private expenditures on higher education. Public higher education expenditures consist of expenditures from the state's central budget. Private expenditures consist of the expenditures of all individuals who are receiving a higher education and the expenditures of their families or the expenditures of private legal entities. As is the case for many countries around the world, the largest share of higher education expenditures is allocated to public expenditures. In the 2005-2013 period, the share of public funds within higher education financing was fixed at 71%. In Turkey, this share is 75%. Therefore, the share of public expenditures on higher education in Turkey is higher than the OECD average. Although higher education is largely financed through public funds, it has been discussed that contributions from private expenditures need to be increased due to the fact that the public funding of higher education institutions is becoming increasingly inadequate in the face of expanding access to higher education (BHE, 2007; Boer, Jongbloed, Enders and File, 2010; Gölpek, 2011; Günay, 2011; OECD 2016; TÜSİAD, 2003). However, increasing the share of private expenditures for higher education may increase inequality because it bears the risk of adversely impacting the higher education demand among people with low income. Therefore, providing citizens with equal opportunity for higher education while developing a sustainable financing model is one of the most difficult and controversial topics in the financing of higher education. While one side of the policy debate argues that education is a human right and therefore advocates for increasing public funds for higher education, the other side argues that students should shoulder some of the cost of higher education, and that higher education services provided by private institutions should be expanded and that the state should provide financial support to the students of these institutions.

The issue of fees and tuition is one of the most highlighted topics in the private financing of higher education around the world. The discussion around this topic mostly concerns the determination of tuition fees, and how the pay back mechanism could be structured in a way that does not prevent different segments of society from accessing higher education (Eurydice, 2016). The U.S, the U.K, Japan and South Korea are among the countries with the highest tuition fees. In most OECD countries public universities charge tuition fees just as private universities do. The annual average university tuition fee in the U.S is $8.000 and for private universities the average is over $21.000. Annual tuition fees in New Zealand, Israel, the Netherlands, and Italy are below $5.000. Public university education is tuition free in countries such as Turkey, Denmark, Finland, Norway and Sweden (OECD, 2016). (Students in Turkey enrolled in evening education and open education programs pay a low tuition fee or a contribution fee.)

Table F.4.1 shows the trends in higher education expenditures according to the source of financing. In this framework the expenditures of the state have been examined in

Table F.4.1 Trends in higher education expenditures by source of finance (million TL)) (2011-2015)

Year	Public expenditures			Private expenditures				Total expenditure on higher education
	Central	Local	Total	Household	Private legal entities	International sources	Total	
2011	21,826	54	21,880	4,094	2,858	110	6,952	28,942
2012	24,176	60	24,236	6,181	3,139	118	9,320	33,674
2013	27,551	77	27,628	6,084	4,041	141	10,126	37,895
2014	31,669	34	31,704	6,407	4,112	143	10,519	42,366
2015	34,663	42	34,705	6,183	3,343	43	9,525	44,273

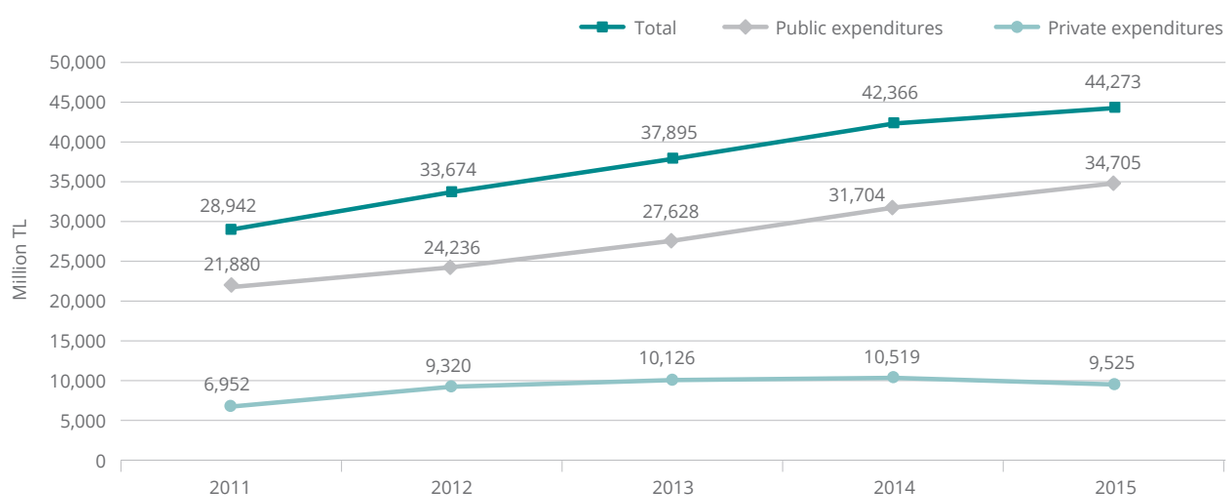
Source: Compiled using TURKSTAT's (2016) education expenditure statistics.

two subcategories, central and local. Private expenditures have been examined in three subcategories: household expenditures, private legal entities, and international sources. The first finding that stands out when the table is examined is that most of the higher education expenditures are made up of the funds transferred from the central budget. The local share of public expenditures is very small. On the other hand, household expenditures make up the largest share among private expenditures. The expenditures of private legal entities are more than half of household expenditures. The fact that the expenditures of private legal entities are low indicates that the aid provided to universities and students, sponsorships, grants and donations of the businesses and organizations in question are also low. Although international funds are also low, they are higher than local resources. The fact that internationally sourced expenditures are low indicates that universities in Turkey receive very few projects and grant support from organizations such as the European Union.

Figure F.4.2 shows the trends in higher education expenditures by source of financing between the years 2011 and 2015. When expenditures in the 2011-2015 period are examined, it can be observed that the central expenditures for higher education have been increasing while local expenditures are declining. **This finding indicates that universities are becoming increasingly dependent on the central administration budget.** The fact that the budget provided by local governments is low indicates that universities' cooperation with the local governments and stakeholders is inadequate. The largest share among private expenditures comes from household expenditures. Although there are no tuition fees or in some cases very low tuition fees at public institutions, the most important source of financing after the central budget is household expenditures. These expenditures mostly consist of spending on individual needs, housing etc. The tuition fees of foundation higher education institutions are another factor that drives up household expenditures.

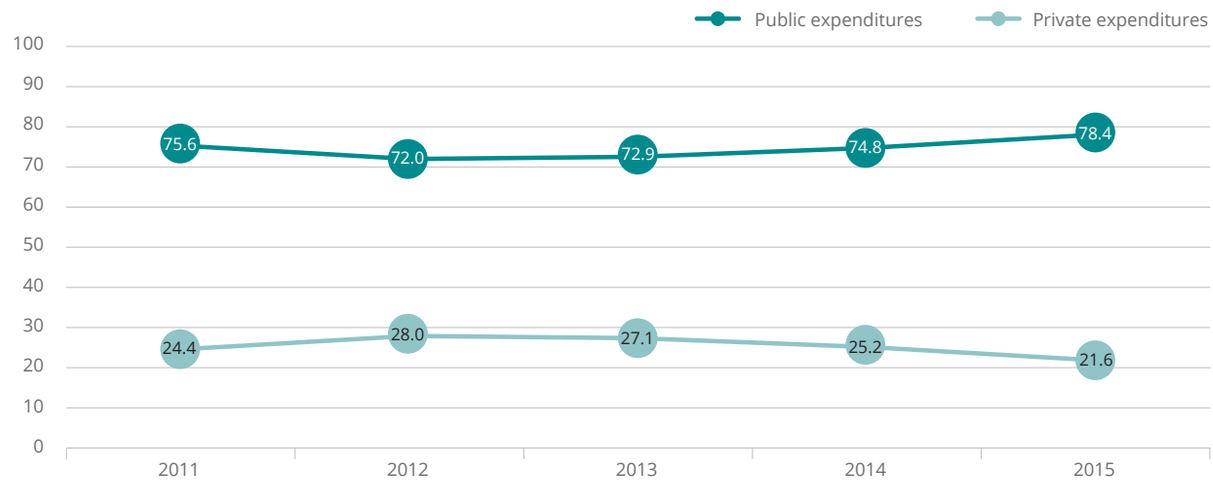
Figure F.4.3 shows the trends in expenditures by source of financing in the period of 2011-2015. According to the figure, the share of public expenditures devoted to higher education increased from 75.6% to 78.4%, while private expenditures declined to 21.6% from 24.4%. Although the state's contribution to higher education expenditures declined after 2011, it increased constantly afterwards and private expenditures declined. This data shows that universities in Turkey are heavily dependent on public financing. Therefore, Turkey may face difficulties in allocating adequate resources for a growing higher education system.

Figure F.4.2 Trends in higher education expenditure by source of financing (million TL (2011-2015)



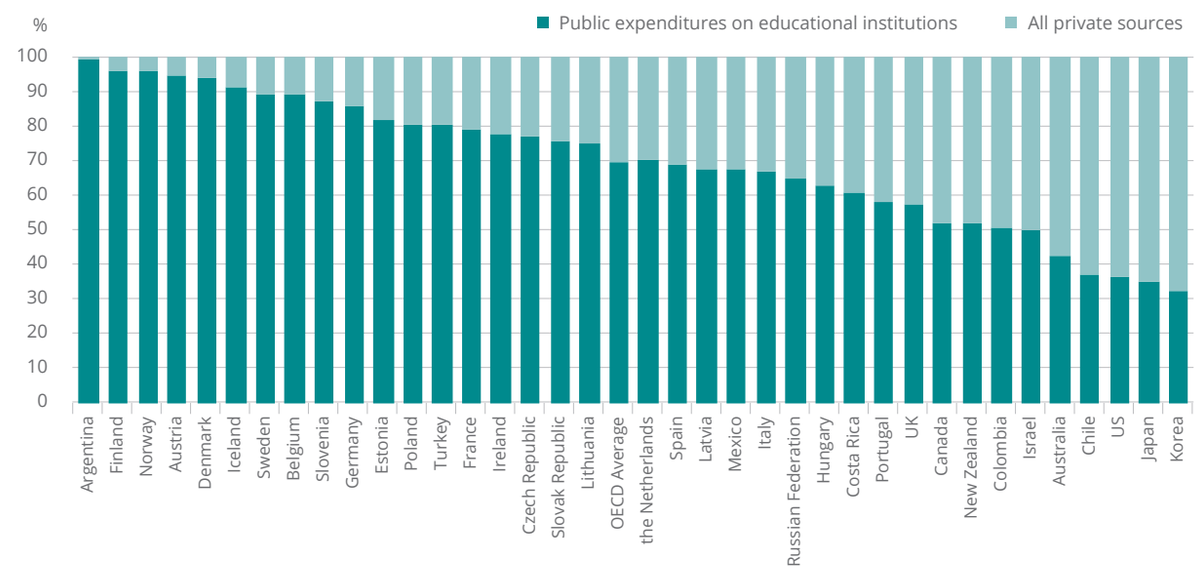
Source: Compiled using TURKSTAT's (2016) education expenditure statistics.

Figure F.4.3 Trends in expenditures by source of financing (%) (2011-2015)



Source: Compiled using TURKSTAT's (2016) education expenditure statistics.

Figure F.4.4 Shares of public and private expenditures on higher education in OECD countries (2013)

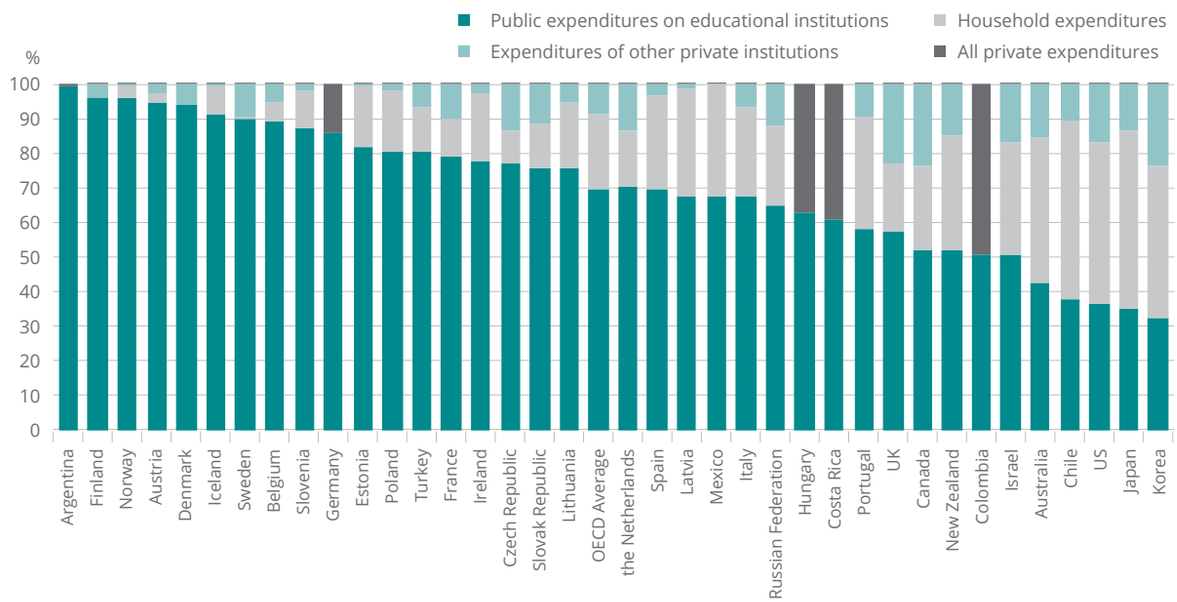


Source: OECD (2016)
Note: OECD partner countries have been shown in the figure as well.

Figure F.4.4 presents the shares of public and private expenditures on higher education in OECD countries according to 2013 data. Public expenditures are higher than private expenditures in 33 out of 38 countries. The five countries which have higher private expenditures compared to public expenditures are Australia, Chile, the U.S, Japan, and Korea. The average share of public expenditure on higher education in OECD countries is 70%. This share is 80% in Turkey. **As is the case for most OECD countries, the main source of higher education funding in Turkey e is the state.**

According to 2013 data, the share of public expenditures and private expenditures (expenditures of private institutions, households) among total higher education expenditures of OECD countries is presented in Figure F.4.5. As shown in the figure, household expenditures have the largest share within higher education expenditures after public expenditures. In the U.S and Japan, where the higher education system is more advanced, the expenditures are mostly made up of household and government expenditures. Household expenditures in both of these countries are higher than public expenditures. **Turkey's public expenditure ratio is above the OECD average, while household expenditure and private institution's expenditure ratios are below the OECD average.**

Figure F.4.5 Public and private higher education expenditures in OECD countries by expenditure type (2013)



Source: OECD (2016)
Note: OECD partner countries have been shown in the figure as well.

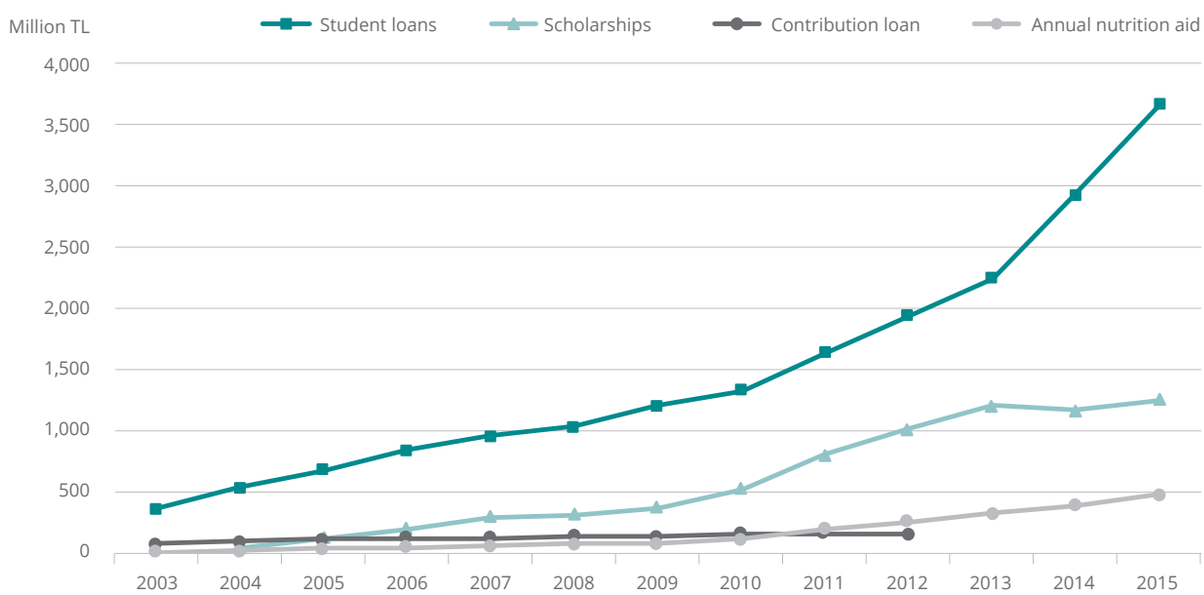
INDICATOR F5

THE SCHOLARSHIPS, LOANS AND AIDS PROVIDED BY THE LOANS AND DORMITORIES AGENCY

This section examines the budgets allocated to various aids for students by the Loans and Dormitories Agency (LDA). LDA provides students with student loans, scholarships, contribution loans and annual nutrition stipends. Students who receive student and contribution loans have to pay back the loan after completing their education. Scholarships and nutrition aid are provided without having to repay them.

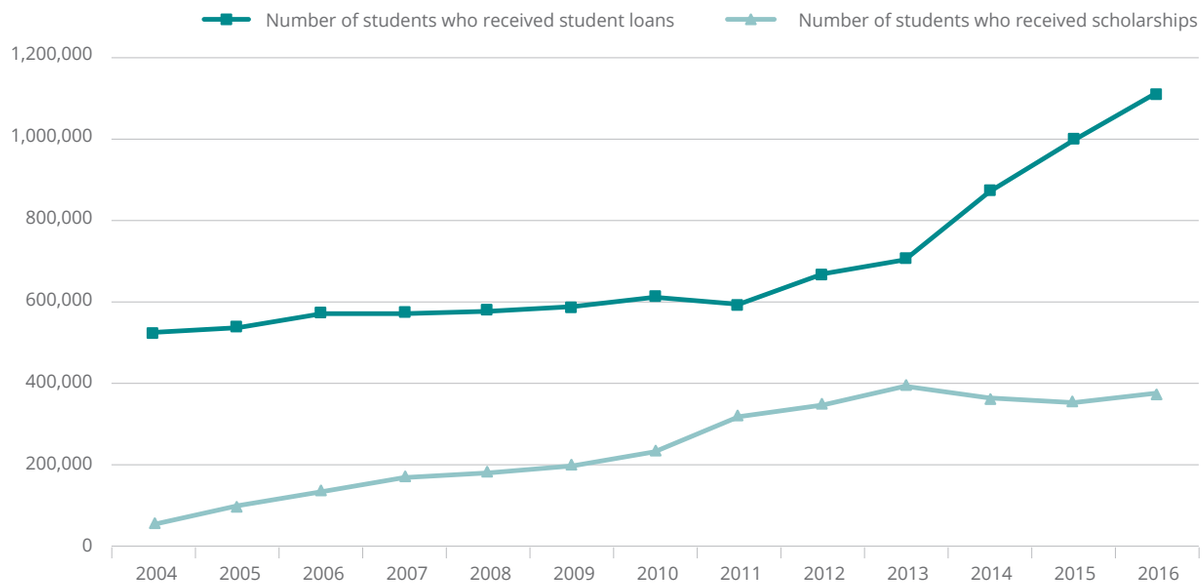
Figure F.5.1 shows the trends in the total amount of scholarships/loans/nutrition aid LDA provides according to type of aid in the 2003-2015 period. According to the figure, the budget allocated to student loans increased from 363 million TL to 3.680 million TL; the nutrition aid budget increased from 13 million TL to 484 million TL; the scholarship budget increased from 49 million TL to 1 billion 260 million TL. Contribution loans increased from 73 million in 2003 to 163 million TL in 2012 when tuition fees were abolished. In all four of these areas there have been constant increases in the budgets allocated. As we will discuss later on, the scholarships provided have increased above the consumer price index (CPI) rates (see Figure F.5.3).

Figure F.5.1 Trends in the total amount of scholarships/loans/nutrition aid LDA is provided by aid type (2003-2015)



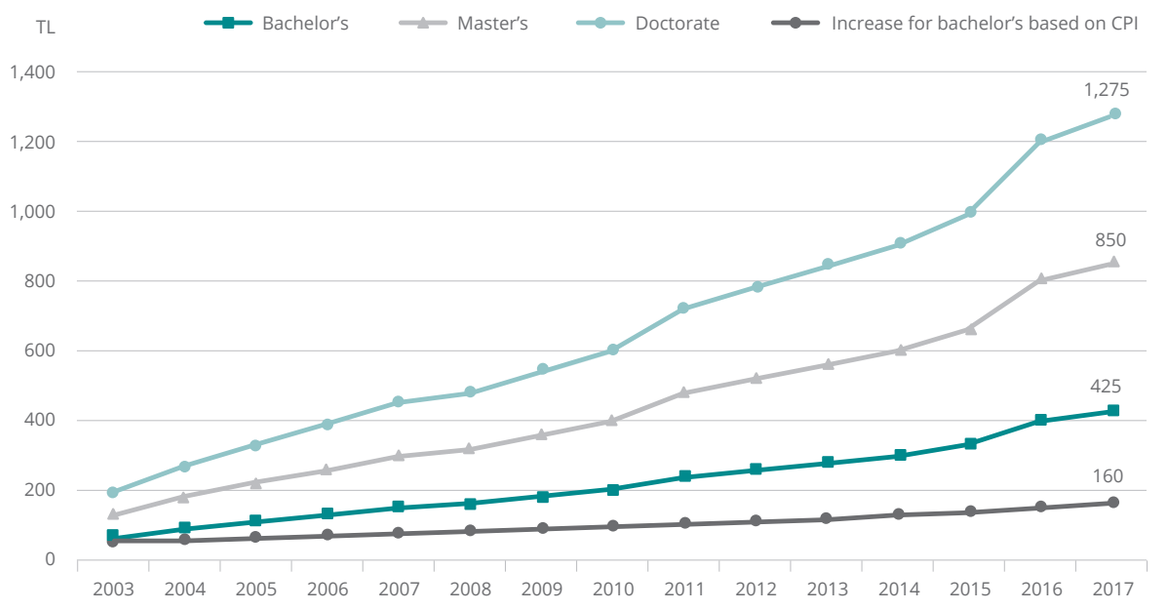
Source: Compiled using MONE statistics and LDA activity reports published in various years.

Figure F.5.2 Trends in the number of students who received student loans and scholarships from the LDA (2004-2017)



Source: Compiled using MONE statistics and LDA activity reports published in various years.

Figure F.5.3 Trends in the amount of student loans/scholarships by education level and the trends in the increase of bachelor's loans/scholarships based on the Consumer Price Index (CPI) (TL) (2003-2017)



Source: Compiled using MONE statistics and LDA activity reports published in various years.

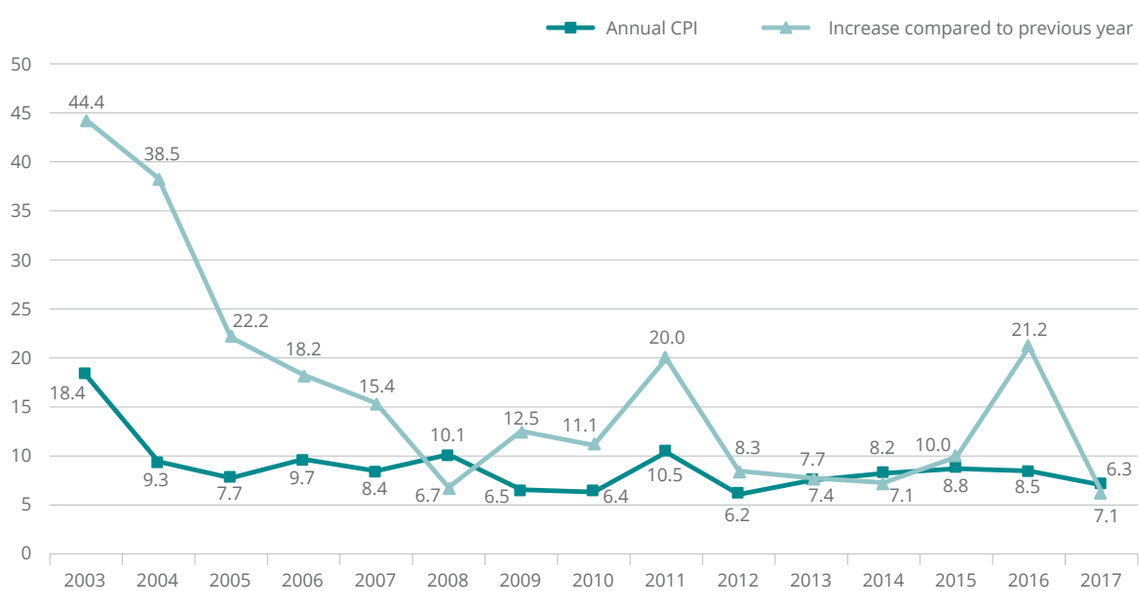
Figure F.5.2 shows the trends in the number of students who received student loans and scholarships from LDA between 2004 and 2016. According to the figure, the number of students receiving loans and scholarships is increasing. While 522.670 students received student loans from LDA in 2004, this number increased to 592.582 in 2011.

In 2016, the number of students receiving student loans from LDA was 1,112,446. While the number of students receiving scholarships was 54,724 in 2004, this increased to 320,912 in 2011, and to 373,843 in 2016. Although the number student loan recipients rapidly increased after 2014, the number of scholarship recipients declined slightly in the same period. While the total number of students receiving student loans and scholarships was 577,394 in 2004, this number increased to 1,486,289 in 2016.

Figure F.5.3 shows the trends in the amount of student loans/scholarships by education level and the trends in the increase of bachelor's loans/scholarships based on the Consumer Price Index (CPI) in the 2003-2017 period. (The scholarship amount provided by LDA has been the same as the student loan amount since 2004). The loans and scholarships at the bachelor's, master's and doctoral level have been increasing at the same rate every year. The amount of master's scholarships/loans is double the bachelor's scholarships/loans while the number doctoral scholarships/loans is three times the master's scholarships/loans. Bachelor's students received loans of 65 TL per month in 2003, master's students received 130 TL per month and doctoral students received 195 TL per month. These amounts increased to 425 TL, 850 TL, AND 1275 TL in 2017. The amount of loans and scholarships that LDA provides has increased at all education levels (bachelor's, master's and doctoral). There have been significant increases in loan and scholarship amounts in the years 2011 and 2016. **Adjusted according to the CPI, while bachelor's students received 53 TL in 2003, they received 160 TL in 2017.**

Figure F.5.4 shows the trends in the rate of increase for the monthly student loans/scholarships that LDA provides and the trends in CPI rates i between 2003 and 2017. The annual increase for the loans and scholarships provided to students has been higher than the annual CPI increase rate (excluding a few years). According to the figure, the scholarships and loans have increased above the inflation rate during the 2003-2007 period. The increase rate of scholarships and loans were below the annual CPI increase rates in 2008, 2014 and 2017. Increases above the CPI rate took place in other years. Significant increases took place particularly in 2011 and 2016.

Figure F.5.4 Trends in the rates of increase for the monthly student loans/scholarships that LDA provides and the trends in CPI rates (%) (2003-2017)



Source: Compiled using MONE statistics, LDA activity reports and TURKSTAT data published in various years.

HIGHLIGHTS

The share allocated from the central budget and GDP for higher education has been increasing (see Figure F.1.2). Even in the most developed countries of the world, there has been a decline in public financing of higher education despite the increasing need of resources for higher education institutions. The situation in Turkey shows the opposite trend. Governments in Turkey have made significant efforts to provide the necessary funding in order to ensure that the higher education system expanded in a healthy manner. **Since the expansion of the Turkish higher education system is continuing and the system is becoming more accessible, the resources required by the higher education system are going to increase even more in the coming years.**

The budget allocated to higher education from the central public budget (see Figure F.1.4) and from the GDP (see Figure F.1.5) have been above the OECD average in Turkey. However, expenditure per student has been below the OECD average. Turkey's policy stance in this context is to increase access to higher education and it can be said that this stance will continue for a while. However, considering that expenditure per student is directly related to the quality of education that students receive, **the issue of balancing the increase in the number of students and expenditure per student is going to be a major challenge for Turkey.** The most difficult issue in this context is maintaining education quality by increasing expenditure per student while increasing access to higher education.

The resource requirements of universities are increasing, particularly the requirements of newly established ones, due to investment expenses, personnel expenses and current expenses. Access to the higher education system in Turkey has significantly improved and the number of students in the system has increased substantially. As a result, **although the share allocated to higher education has been constantly increasing in Turkey, the increases have been inadequate when efforts to increase access to education and improving education quality are considered.** 80% of the higher education expenditures are current expenditures while 20% are capital (investment) expenditures (see Figure F.3.2). The share of capital expenditures within total expenditures is higher than most OECD countries (see Table F.3.4). The main reason for this is that Turkish higher education is going through a growth phase and this requires major infrastructure investments for newly established universities in particular (OECD, 2010). The increase in capital expenditures is important for making sure that the quality and efficiency of higher education institutions are improved by strengthening their infrastructure. However, the fact that capital expenditures are higher in Turkey leads to a situation in which the share of current expenditures of universities is much lower in comparison to other OECD countries.

Current expenditures except personnel expenses are particularly related to education and other campus services provided for students (dining, housing, social facilities, sports, cultural activities). **The existing current expenditure capacity of Turkish universities is not enough to improve the quality of education and campus services.** The increase in higher education re-

sources is only related to the state's central expenditures. During the period of 2011-2015, expenditures on higher education from sources other than the state's expenditures did not improved as a matter of fact they declined.

Following 2006, new universities were established in Turkey and the higher education field entered a phase of significant development. **In 2012, tuition fees and student contribution fees were abolished (with the exception of r evening and open education programs).** As a result, higher education at public universities became a completely public and free service. Although this led to the state allocating a higher portion of the central budget to higher education, when the social and economic outcomes are considered, it can be said that there will be positive results in the long run. Tuition-free higher education is particularly important for incentivizing students coming from low income backgrounds to pursue higher education. Even low tuition fees reduce the higher education demand from individuals from low income backgrounds (Colclough and Manor, 1991).

Higher education expenditures consist of public and private expenditures. Higher education is financed mostly by the state both in Turkey and around the world. The share of public expenditure in higher education is 75% in Turkey which is above the OECD average (71%) (OECD, 2016). **The need for financing is going to increase in the coming years as the higher education system expands.** For this reason, the issues of how to reduce universities' dependency on public finances and how to ensure the diversification of resources stand out as important discussion areas. This brings forth the challenge of universities increasing their private financial resources.

There has been a constant increase in the scholarship/loan/nutrition aid provided by the Loans and Dormitories Agency (LDA) between the years 2003 and 2015 (see Figure F.5.1. When the Consumer Price Index (CPI) is considered, there have been increases above the CPI rates (see Figure F.5.3). **Adjusted according to the increases in the CPI, while a stipend of 53 TL a month was provided for bachelor's students in 2003, this increased to 160 TL in 2017.** This shows that there have been significant increases in scholarships and loans.

RECOMMENDATIONS

- Although Turkey has constantly increased the budget allocated to higher education, the expenditures per student have remained low. **Public resources should be increased even more in order to offset the expansion of the higher education system which is a desired development.**
- Due to the dependency of the rapidly expanding Turkish higher education system on public finances, the diversification of financial resources for universities is crucial in developing a sustainable financial framework. In this context, **universities should increase their activities in research and development, participate in more income producing or social support projects, invest in distance education and lifetime learning programs.** Universities finding ways to cooperate with private enterprises is important both financially and in terms of the university fulfilling its mission effectively. Universities do not only achieve material gain through projects and other income producing activities, but more importantly they also improve their research capabilities. Universities should cooperate with outside organizations through collaborative projects and they should effectively utilize support mechanisms such as donations or sponsorship programs.
- Considering that current expenditures at the higher education level (laboratory tools and equipment, technical staff) are higher compared to lower education levels, the share allocated to current expenditure should be increased within the higher education budget.

CHAPTER F

REFERENCES

BHE. [YÖK] (2007). *Türkiye'nin yükseköğretim stratejisi* [Turkey's higher education strategy]. Ankara: T. C. Yükseköğretim Kurulu.

Altbach, P. G., Reisberg, L., & Rumbley, L. E. (2009). *Trends in global higher education: Tracking an academic revolution*. Paris: UNESCO.

CHEPS. (2010). *Progress in higher education reform across Europe. Funding reform. Volume 1: Executive summary and main report*. Centre for Higher Education Policy Studies. Retrieved from http://ec.europa.eu/education/higher-education/doc/ funding/vol1_en.pdf

Boer, H. de, Jongbloed, B., Enders, J., & File, J. (2010). *Progress in higher education reform across Europe, Funding reform, Volume 1: Executive Summary and main report*. Enschede, the Netherlands: Centre for Higher Education Policy Studies. http://doc.utwente.nl/88692/

Colclough, C. & Manor, J. (1991). *States or markets an assessment of neo liberal approaches to education policy*. Oxford: Clarendon Press.

Çetinsaya, G. (2014). *Büyüme, kalite ve uluslararasılaşma: Türkiye yükseköğretimi için bir yol haritası* [Growth, quality, internationalization: A roadmap for Turkish higher education]. Eskişehir: Yükseköğretim Kurulu Başkanlığı.

Eğitim-Bir-Sen, (2016). *Eğitime bakış 2016: İzleme ve değerlendirme raporu* [Outlook on Education 2016: Monitoring and evaluation report]. Ankara: Eğitimciler Birliği Sendikası.

Eurydice. (2016). *National student fee and support systems in European higher education 2016/17*. Brussels: European Commission.

Gölpek, F. (2011). Yükseköğretim finansman politikasında yeni bir yaklaşım: Maliyet paylaşımı [A new approach to higher education finance policy: cost sharing]. *Yükseköğretim Dergisi*, 1 (1) 25-33.

Günay, A. (2011). Türkiye'de yükseköğretimin finansmanı: Kriterler, zorluklar ve alternatif stratejiler [The financing of higher education in Turkey: Criteria, challenges and alternative strategies]. *Uluslararası Yükseköğretim Kongresi: Yeni Yönelişler ve Sorunlar (UYK-2011)* [International Higher Education Conference: New Approaches and Problems], 2, 1159-1169.

Johnstone, B. & Marcucci P. (2007). *Worldwide trends in higher education finance: Cost sharing, student loans, and the support of academic research*. Paris: UNESCO.

Kurt, T. ve Gümüş, S. (2015). Dünyada yükseköğretimin finansmanına ilişkin eğilimler ve Türkiye için öneriler [Trends of financing higher education in the world and recommendations for Turkey]. *Yükseköğretim ve Bilim Dergisi*, 5(1), 14-26.

OECD. (2010). *Education at a glance 2010*. Paris: Organisation for Economic Co-operation and Development.

OECD. (2015). *Education at a glance 2015*. Paris: Organisation for Economic Co-operation and Development.

OECD. (2016). *Education at a glance 2016*. Paris: Organisation for Economic Co-operation and Development.

OECD. (2017). *State of higher education 2015-16*. Paris: Organisation for Economic Co-operation and Development.

Psacharopoulos, G. (2009). *Returns to investment in higher education a European survey. Higher education funding reform project*. Brussels, Belgium: European Commission.

Psacharopoulos, G., & Woodhall, M. (1985). *Education for development: An analysis of investment choices*. Washington D.C.: The World Bank.

TURKSTAT. (2016). *Eğitim harcamaları istatistikleri, 2015* (Haber Bülteni No. 21548) [Education expenditure statistics, 2015 (Bulletin No. 21548)]. Ankara: Türkiye İstatistik Kurumu.

TÜSİAD. (2003). *Yükseköğretimin yeniden yapılandırılması: Temel ilkeler* [Restructuring of higher education: Basic principles]. İstanbul: Türk Sanayicileri ve İşadamları Derneği Yayınları.

World Bank. (2007). *Turkey: higher education policy study, volume 1. Strategic directions for higher education in Turkey*. Washington, DC: The World Bank.

CHAPTER G

PERFORMANCE OF ACADEMICS AND UNIVERSITIES

In this chapter, the number of Turkey-based scientific publications, the number of citations and impact assessments along with their world rankings will be analysed. After this, universities and academic personnel's scientific publication performances will be assessed. In accordance with various indicators, universities' national and international rankings will be analysed comparatively with the world university rankings. Lastly, data on higher education Research and Development (R&D) expenditure and patent applications will be provided. In addition, Entrepreneurial and Innovative University Index Rankings by the Scientific and Technological Research Council of Turkey (TÜBİTAK) will be examined.

INDICATOR G1 ACADEMIC PUBLICATION PERFORMANCES and COUNTRY RANKINGS

Academic publication indicators are the most prominent in terms of evaluating the performance of academic personnel. This indicator also provides insight on the research performance of higher education institutions. Moreover, the number of academic book publications are also important. According to TURKSTAT data, 51,113 books were published in Turkey throughout 2016. 13.7% of these books were academic; with an increase of 9.9% compared to the previous year, the number of academic books reached 7,481 (TURKSTAT, 2017).

Looking at the Scopus database for scientific publication performance between the years 1996-2015, it can be seen that the number of publications has ranged from 39,000-40,000 from 2013 onward, despite the increase in every year (Table G.1.1). Meanwhile, the international share of publications originating from Turkey has increased from 0,49% to 1.52% within 20 years. **Examining the number of citations per document, it can be seen that it has shifted between 11-16 until 2008, while declining in the following years.** Even though the number of documents increased over the years, the number of citations did not follow this trend; therefore, the number of citations per document was negatively affected. Considering that publications are mostly cited after several years, it can be asserted that the number of citations may increase in the following years (Çetinsaya, 2014).

Table G.1.1 Turkey's number of international publications in the Scopus database by year (1996-2015)

Rank	Number of citable documents	Number of citations	Self-citation	Citations per Document	International collaboration (%)	Regional output (%)	World (%)
1996	5,638	65,108	18,060	11.55	18.16	24.00	0.49
1997	6,037	75,886	21,154	12.57	16.65	24.32	0.51
1998	6,561	89,047	23,515	13.57	17.34	25.95	0.56
1999	7,811	107,002	29,143	13.70	15.95	28.91	0.66
2000	7,870	127,032	31,508	16.14	16.35	27.47	0.62
2001	9,488	147,496	37,085	15.55	13.37	30.94	0.70
2002	12,074	188,652	47,578	15.62	13.64	34.33	0.85
2003	15,034	230,905	54,980	15.36	17.36	35.07	1.00
2004	18,208	278,596	64,465	15.30	18.08	37.36	1.12
2005	20,519	285,578	65,279	13.92	17.05	37.07	1.10
2006	22,864	285,665	66,557	12.49	16.56	36.15	1.17
2007	24,978	313,782	69,013	12.56	17.02	35.18	1.20
2008	25,834	279,296	64,659	10.81	18.08	32.87	1.19
2009	30,235	273,974	65,243	9.06	16.68	33.01	1.32
2010	32,697	225,944	57,449	6.91	16.75	31.46	1.35
2011	34,504	193,192	49,987	5.60	17.12	28.43	1.34
2012	35,954	164,979	40,332	4.59	19.24	27.71	1.34
2013	39,327	109,565	29,483	2.79	19.31	28.42	1.41
2014	39,898	56,343	15,609	1.41	19.70	27.45	1.40
2015	39,275	11,382	3,027	0.29	20.50	28.24	1.52

Source: SCIMAGO (2017)

Table G.1.2 Total publication performance rankings according to Scopus data (1996-2015)

Rank	Country	Number of citable documents	Number of citations	Citations per Document	Citation rank	*h* index	*h* index rank
1	US	9,360,233	202,750,565	21.66	1	1783	1
2	China	4,076,414	24,175,067	5.93	7	563	14
3	UK	2,624,530	50,790,508	19.35	2	1099	2
4	Germany	2,365,108	40,951,616	17.31	3	961	3
5	Japan	2,212,636	30,436,114	13.76	4	797	6
6	France	1,684,479	28,329,815	16.82	5	878	4
7	Canada	1,339,471	25,677,205	19.17	6	862	5
8	Italy	1,318,466	20,893,655	15.85	8	766	7
9	India	1,140,717	8,458,373	7.41	15	426	21
10	Spain	1,045,796	14,811,902	14.16	11	648	12
11	Australia	995,114	16,321,650	16.40	10	709	10
12	South Korea	824,839	8,482,515	10.28	14	476	19
13	Russia	770,491	4,907,109	6.37	23	421	22
14	Netherlands	746,289	16,594,528	22.24	9	752	8
15	Brazil	669,280	5,998,898	8.96	18	412	23
16	Switzerland	541,846	12,592,003	23.24	12	744	9
17	Taiwan	532,534	5,622,744	10.56	20	363	29
18	Sweden	503,889	10,832,336	21.50	13	666	11
19	Poland	475,693	4,083,631	8.58	24	401	24
20	**Turkey**	**434,806**	**3,509,424**	**8.07**	**26**	**296**	**37**
21	Belgium	407,993	7,801,077	19.12	16	593	13
22	Iran	333,474	1,954,324	5.86	37	199	42
23	Israel	295,747	5,826,878	19.70	19	536	16
24	Austria	295,668	5,052,810	17.09	21	487	17
25	Denmark	290,994	6,405,076	22.01	17	558	15
26	Finland	257,159	4,940,153	19.21	22	479	18
27	Greece	246,202	3,186,313	12.94	28	354	30
28	Czech Republic	237,910	2,204,922	9.27	34	322	33
29	Mexico	232,828	2,305,554	9.90	33	316	35
30	Norway	229,276	3,951,661	17.24	25	439	20

Source: SCIMAGO (2017)

In Table G.1.2, based on Scopus database, the top 30 countries' total publication performances and rankings between the years 1996-2015 are shown. According to the data, Turkey ranks 20th in terms of total publication numbers; however, according to the *h* index and number of citations, Turkey ranks 37th and 26th, respectively. As previously explained, the *h* index is an indicator of how many times a researcher has been cited. A researcher's *h* index is defined as the highest number of publications that received *h* or more citations each. For instance, if a researcher who has 45 total publications including 10 publications with at least 10 citations, his/her *h* index is 10.

It can be seen that the US ranks first in terms of the number of citable documents, the number of citations and the *h* index. This is directly related to the number of universities and academic personnel resources in the US. 25 out of the top 50 scientific journals originating from the US support this data (Table G.2.3). Considering that China ranked 2nd, 8th and 16th in the number of citable documents, the

Table G.1.3 Turkey-based publications at Web of Science and Scopus databases (2000-2015)

Year	Web of Science Turkey-based publications		Scopus Turkey-based publications	
	Number of publications	Number of articles	Number of publications	Number of articles
2000	6,984	5,382	7,817	6,828
2001	8,424	6,596	9,432	8,095
2002	10,815	8,893	11,986	10,192
2003	13,204	10,540	14,792	12,295
2004	16,360	13,094	18,116	14,534
2005	17,657	14,099	20,906	16,667
2006	20,124	14,947	23,229	18,569
2007	24,179	17,719	25,466	20,429
2008	25,136	19,166	26,380	21,834
2009	28,599	21,476	30,742	25,152
2010	29,493	22,599	33,224	26,022
2011	30,494	23,388	35,000	27,590
2012	33,021	25,050	36,691	28,832
2013	36,488	26,284	40,247	31,676
2014	37,371	26,912	41,625	32,631
2015	39,171	28,324	43,946	32,598

Source: Compiled using CABİM data (April 2017).

number of citations and *h* index, respectively (Çetinsaya, 2014), it can be seen that China's ranking in terms of the number of citable documents remained the same, while its rankings based on the number of citations and *h* index rose to 7th and 14th respectively. In terms of total publications, it can be seen that Turkey has remained 20th throughout the years.

The Cahit Arf Information Centre (CABİM), which hosts the most extensive physical and electronic scientific information sources as part of the Turkish Academic Network and Information Center (ULAKBİM), allows countrywide access to information and documents. Bibliometric analyses about Turkey's international rankings, serving as an electronic database for Turkey-based scientific journals in five major fields and encouraging scientific research with the International Scientific Publication Incentive Program (UBYT) are the most prominent services offered by CABİM.

Table G.1.3 shows the number of Turkey-based publications in the Web of Science and Scopus databases between the years 2000-2015, which was prepared using CABİM bibliometric analysis data. According to the table, **both databases indicate an increase in the number of Turkey-based publications and articles.** Considering that the increase rate in the number of publications is lower than the increase rate of citations (Table G.1.1), quality of publications is a prominent issue.

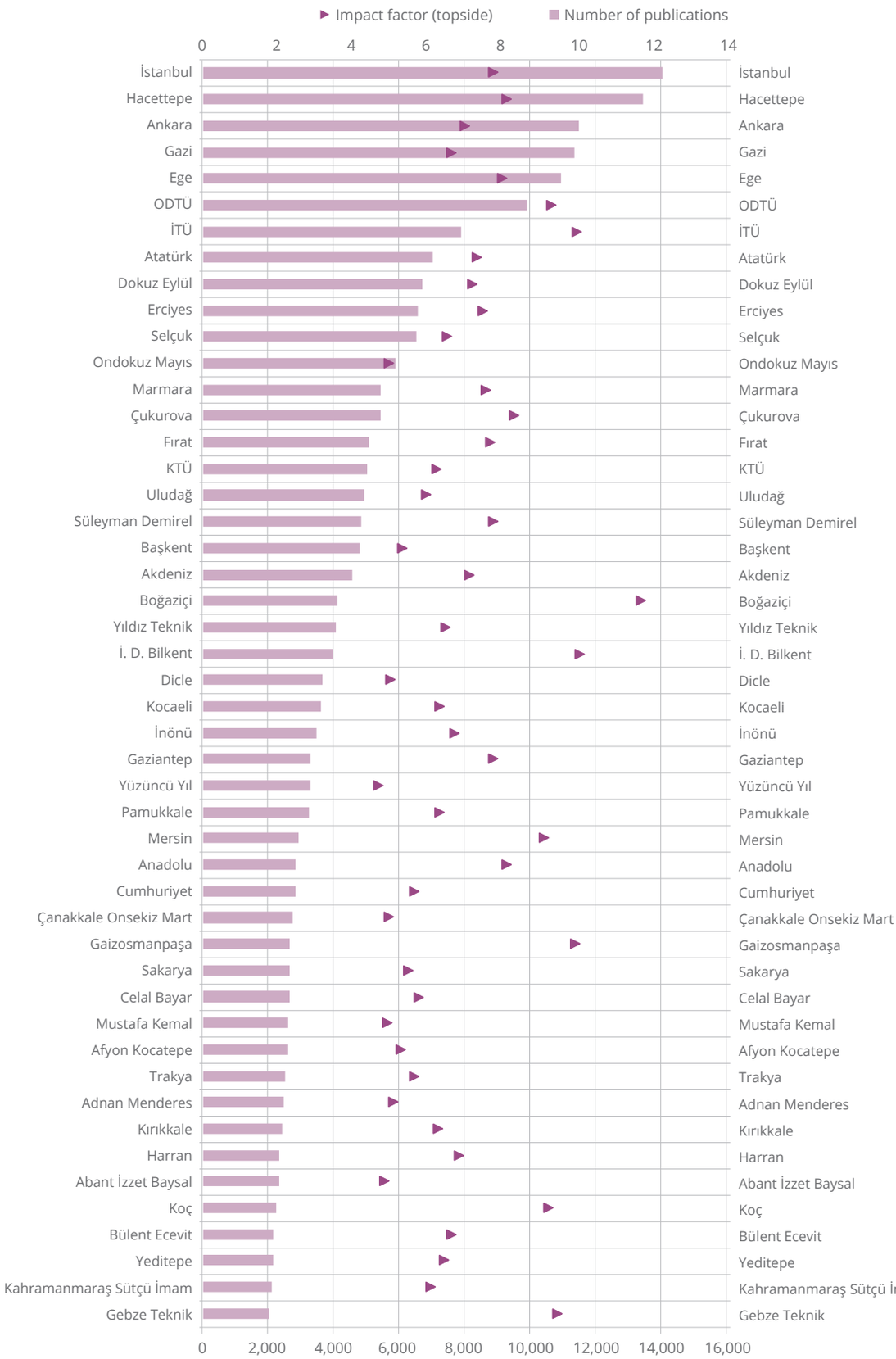
In Table G.1.4, Turkey's scientific publication performance at the Web of Science database according to research areas between the years 2004-2014 is shown. This data allows the comparative analysis of the publication performance of Turkey's academic personnel. In this respect, Turkey's total number of scientific publications between the years 2004-2014 is around 353,000. 34.2% of these publications are in the field of medical sciences (world av-

Table G.1.4 Turkey's scientific publication performance according to Web of Science database by research area (2004-2014)

Research areas	Turkey			World		
	Number of publications	Number of citations	Impact factor	Number of publications	Number of citations	Impact factor
Fundamental sciences	89,540	727,621	8.13	6,657,129	79,872,664	12.00
Medical sciences	120,861	790,337	6.54	6,465,315	101,001,777	15.62
Engineering sciences	88,573	779,095	8.80	4,719,073	45,670,499	9.68
Social sciences	25,425	128,588	5.06	2,216,457	17,218,844	7.77
Agricultural sciences	10,161	67,962	6.69	523,435	5,069,733	9.69
Veterinary, pharmacy and orthodontics	18,704	109,487	5.85	683,224	7,535,390	11.03

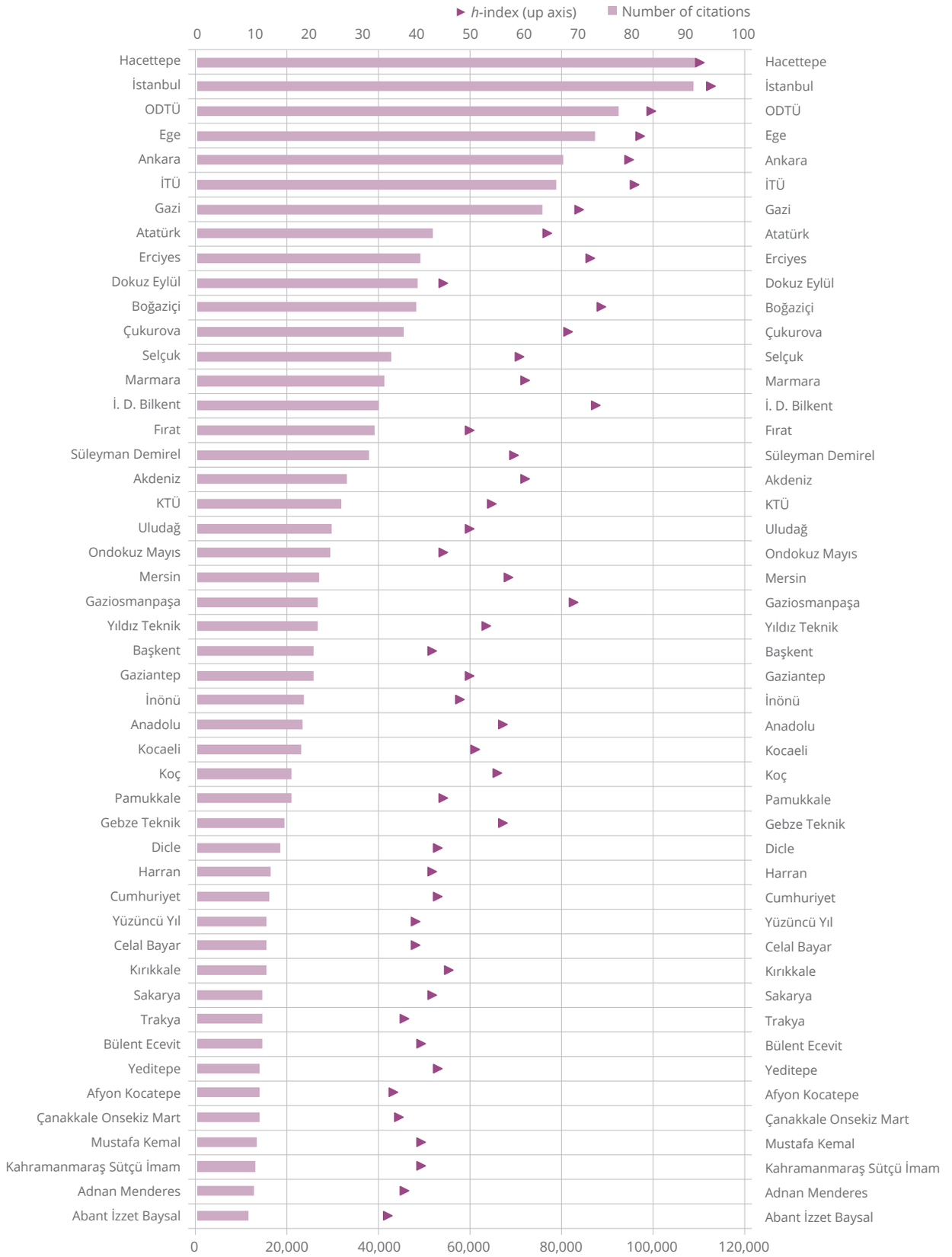
Source: Compiled using CABİM data (April 2017).

Figure G.1.5 Total number of publications and their impact factor at universities in Turkey between the years 2004-2014



Source: Compiled using CABİM data.
Note: CABİM used Reuters InCites database; however, due to the license agreement, CABİM only announced the numbers of publications of the top 50 universities.

Figure G.1.6 Total number of citations in scientific publications by university in Turkey and their h index between the years 2004-2014



Source: Compiled using CABİM data.
Note: CABİM used Reuters InCites database; however, due to the license agreement, CABİM only announced the numbers of publications of the top 50 universities.

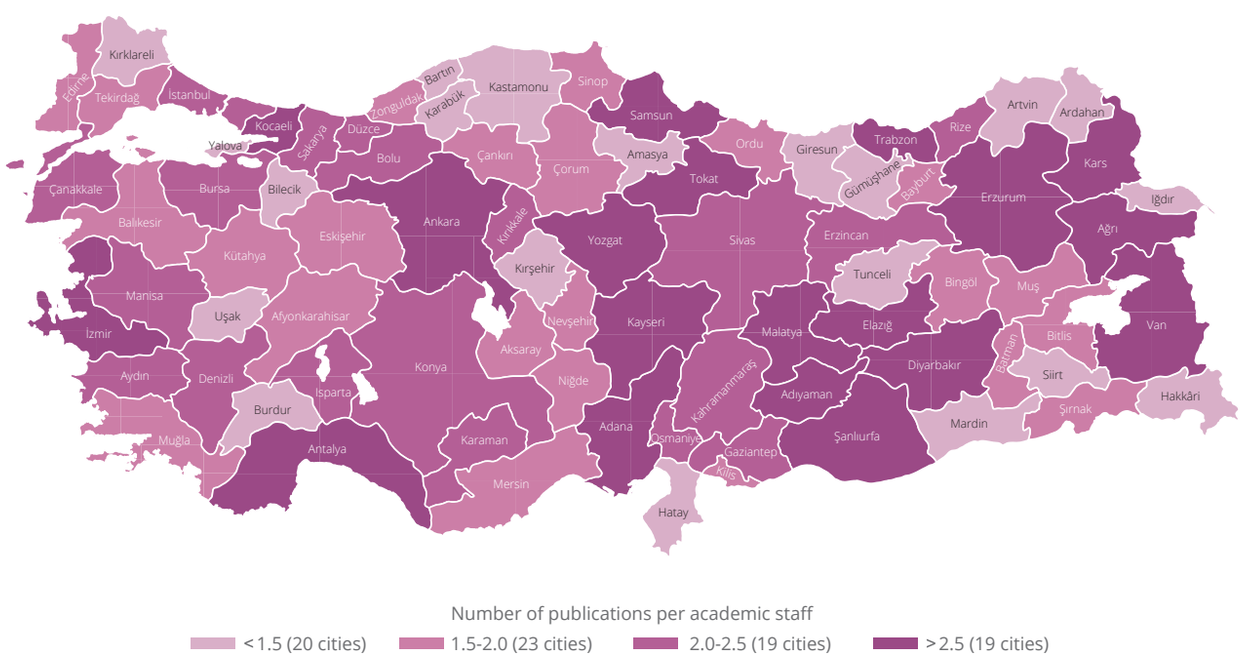
erage 30.4%), 25.3% on fundamental sciences (world average 31.2%), 25.1% on engineering sciences (world average 22.2%), 7.2% on social sciences (world average 10.4%), 5.3% on veterinary, pharmacy and orthodontics (world average 3.2%) and 2.9% on agricultural sciences (world average 2.5%).

In terms of impact factor, engineering sciences which was the most cited field in Turkey between the years 2004-2014 ranked first with an 8.80 impact factor, the world average being 9.68 (Table G.1.4). This is followed by fundamental sciences with 8.13 (world average 12), agricultural sciences with 6.69 (world average 9.69), medical sciences with 6.54, veterinary, pharmacy and orthodontics with 5.85 (world average 11.03) and social sciences with 5.06 (world average 7.77). Even though Turkey is above the world average in certain subfields of sciences (CABİM, 2017), it lags behind in the main subject categories.

Table G.1.5 shows the number of scientific publications and impact factors of universities in Turkey between the years 2004-2014. According to the data, the top five universities with the most publications are Istanbul University (14,069), Hacettepe University (13,457), Ankara University (11,485), Gazi University (11,374) and Ege University (10,942). **Large numbers of academic personnel and large faculties of medicine with a high number of publications are some of the factors that enable the aforementioned universities to have such high rankings.** When the scientific publications of universities are analysed according to impact factor, the number of citations per publication, Boğaziçi University ranks first with 11.7 citations, while İ.D. Bilkent University ranks second with 10.1, İTÜ and Gaziosmanpaşa University third and fourth with 10 and Gebze Technical University comes fifth with 9.5.

The number of times scientific publications of universities in Turkey are cited and the data about their h index are shown in Table G.1.6. According to the data, universities with the most cited scientific publications are Hacettepe University (109,177), Istanbul University (109,137), METU (92,534), Ege University (87,541) and Ankara University (80,506).

Map G.1.7 Number of publications per academic staff by city (2011-2015)



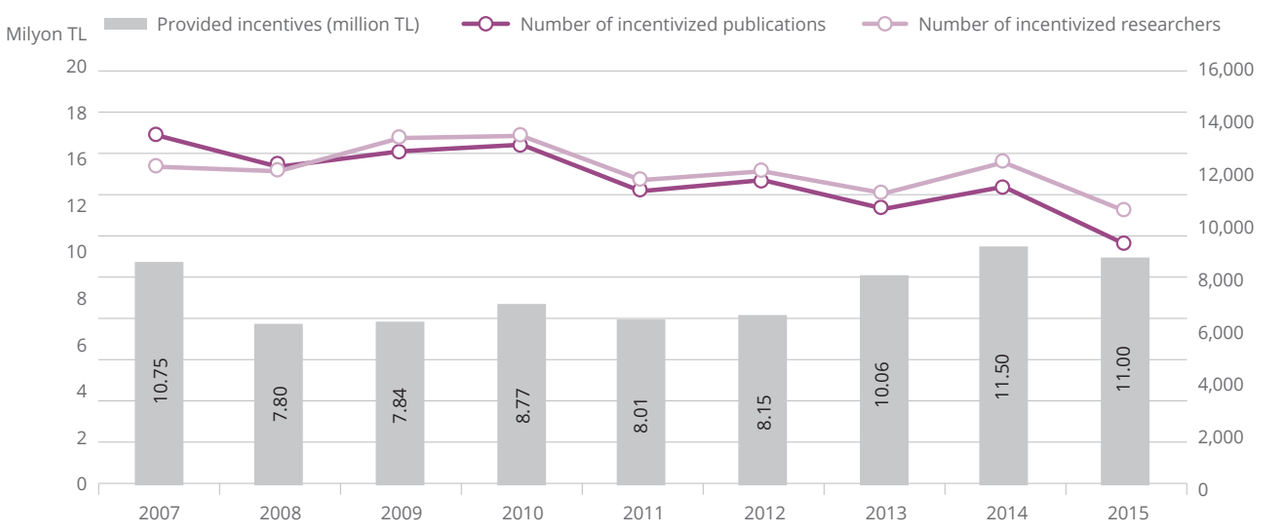
Source: Compiled using CABİM data.
Note: Experts, research assistants, translators and education planners were not included.

Table G.1.7 shows the number of publications per academic staff by city between the years 2011-2015. According to the data, this rate is higher than 2.5 in 19 cities; 4 in Ankara, 3.5 in Adana, 3.3 in Kocaeli, 3.2 in Kayseri, 3 in Erzurum, 3 in Elazığ, 2.9 in Diyarbakır, 2.8 in Antalya, 2.8 in Tokat, 2.8 in Samsun, 2.8 in Kars and 2.7 in Malatya. This rate is between 2 and 2.5 in 19 cities, between 1.5 and 2 in 23 cities and under 1.5 in 20 cities. The cities with the lowest numbers of publications per academic staff member are Hatay (0.8), Kırklareli, Uşak, Mardin (0.9), Artvin and Karabük (1).

It can be expressed that the incentives and academic promotion/appointment criteria implemented by universities and TÜBİTAK have been effective in increasing number of Turkey-based scientific publications. When TÜBİTAK's UBYT data is evaluated together with Table G.1.3, it can be seen that 50-55% of Turkey-based scientific publications received incentives in 2007; however, the rate declined over the years, reaching 20-23% in 2015 (table G.1.8). This is because of a change in the scope of publications that were incentivized. In 2015, 15,298 out of 19,438 applications made to UBYT were admitted and provided with an incentive (ULAKBİM, 2015). TÜBİTAK, as a part of UBYT, provided TL11 million in incentives to 10,572 researchers for 9,260 publications. Table G.1.8 indicates a slight decrease in the number of publications and researchers that were provided with incentives.

In Table G.1.9, trends in the number of projects supported by TÜBİTAK's Directorate of Research Support Programs (ARDEB) and the financial support provided between the years 2000-2015 are shown. According to the data, the already increasing number of academic projects significantly rose in the last few years. Meanwhile, the number of projects supported by ARDEB is increasing at a slower rate. **While 35% of the projects were supported in 2000, this rate increased to 46% in 2002. From 2002 onwards, the rate started to decrease, declining to 18% in 2015.** 5,122 of the ARDEB supported projects were in force in 2015 and were provided with a total support of TL 710 million.

Figure G.1.8 TÜBİTAK data on Turkey-based UBYT (2007-2015)



Source: TÜBİTAK ULAKBİM 2015 Activity Report

Table G.1.9 Trends in the number of projects supported by TÜBİTAK's ARDEB and the financial support provided (2000-2015)

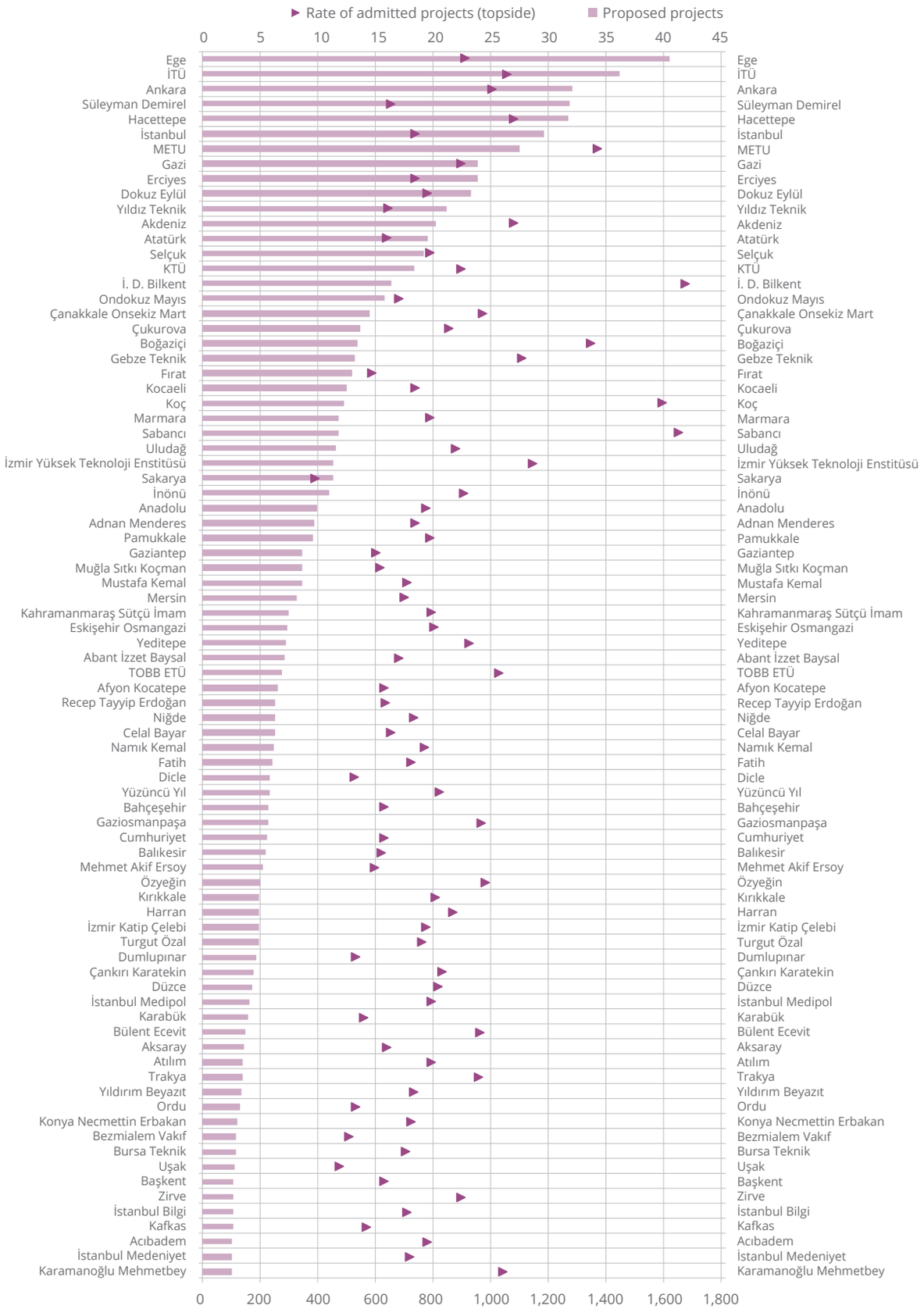
Year	Proposed projects	Supported projects	Projects in force	Yearly support for projects in force (TL)
2000	946	335	843	7,461,565
2001	1,149	421	1,001	11,891,608
2002	1,198	548	1,242	17,201,978
2003	867	338	1,227	15,780,224
2004	1,742	480	1,353	21,390,239
2005	4,203	1,480	2,359	141,367,891
2006	4,163	1,366	3,160	369,004,271
2007	5,005	1,304	3,472	539,593,679
2008	4,944	1,188	3,295	437,483,292
2009	4,910	911	2,834	544,789,116
2010	5,154	1,239	2,652	525,642,194
2011	5,060	1,234	2,695	390,056,734
2012	6,182	1,131	2,725	356,872,916
2013	7,856	1,701	3,109	440,887,245
2014	9,623	2,254	4,212	560,273,824
2015	12,116	2,153	5,122	700,945,717

Source: Compiled by using TÜBİTAK data.
Note: Certain public projects were included and the amount of funds were fixed to 2016 prices.

Table G.1.10 shows the number of projects proposed by universities to ARDEB and the rate of ARDEB admittance between 2011-2015. According to the table, Ege University (1,621), İTÜ (1,446), Ankara University (1,238), Süleyman Demirel University (1,271) and Hacettepe University (1,266) are the five universities that proposed the most projects to ARDEB. Looking at the acceptance rates for projects, Hacettepe University has a 27% acceptance rate, while İTÜ has 26.4%, Ankara University 25.1%, Ege University 22.7% and Süleyman Demirel a 16.4% acceptance rate.

In terms of the proposed/accepted projects ratio, İ.D. Bilkent University ranks first with a 41.9% success rate (Table G.1.10). İ.D. Bilkent University is followed by Sabancı University (41.3%), Koç University (39.8%), METU (34.2%) and Boğaziçi University (33.6%). Approximately 94% of the projects proposed to ARDEB between 2011-2015 were submitted by universities; 8,176 of these projects (21.4%) received support, a total of TL 1.6 billion.

Figure G.1.10 TÜBİTAK ARDEB general academic support data by universities (2011-2015)



Source: Compiled using TÜBİTAK data.
Note: Universities with less than 100 project proposals were not included.

INDICATOR G2

TURKEY-BASED SCIENTIFIC JOURNALS and THEIR INTERNATIONAL RANKINGS

Founded in 1996 as a subsidiary of TÜBİTAK, ULAKBİM manages the infrastructure of the National Academic Network connecting national academic institutions with global research networks and maes networks more accessible for researchers.

One of the most important achievements of ULAKBİM is the TR Index which allows researchers to access national and scientific content electronically. The TR Index scans scientific journals for five essential subject categories: health (medical) sciences, engineering and fundamental sciences, social sciences and humanities, life sciences, and law.

Table G.2.1 shows the number of registered journals in the ULAKBİM TR Index according to the aforementioned subject categories by the end of 2016. According to the table, 618 scientific journals are registered to the TR Index; with 297 journals, the social sciences and humanities lead the subject categories. On the other hand, there are 169 journals in the medical sciences database, 62 in life sciences, 54 in engineering and fundamental sciences, and 36 in law.

69 of these journals are being indexed by Thomson Reuters Web of Science databases (SCI, SSCI, AHCI) (Table G.2.2). Looking at Table G.2.2, it can be seen that the majority of the journals with the highest number of publications are registered to medical sciences database. According to the table, Türk Pediatri Dergisi [Turkish Journal of Paediatrics] (2,587 publications), Veterinerlik ve Hayvan Bilimleri Dergisi [Journal of Veterinary and Zoology] (2,410 publications), Anadolu Kardiyoloji Dergisi [Anatolian Journal of Cardiology] (2,306 publications), Türk Kimyacı Dergisi [Turkish Journal of Chemists] (1,641 publications), Kafkas Üniversitesi Veteriner Fakültesi [Kafkas University Faculty of Veterinary Medicine] (1,607 publications) and Türk Tıp Bilimleri Dergisi [Turkish Journal of Medical Sciences] (1,607) are the journals with the most publications.

Table G.2.1 Number of registered journals in the ULAKBİM TR Index (2016)

	Medical sciences	Social sciences and humanities	Life sciences	Engineering and fundamental sciences	Law	Total
Number of journals	169	297	62	54	36	618

Source: Compiled using ULAKBİM TR Index data.

Table G.2.2 Turkey-based scientific journals indexed by Web of Sciences databases (SCI, SSCI, AHCI) according to their number of publications and citations (2016)

Rank	Title	Number of publications	Number of citations	Average impact factors
1	Turkish Journal of Earth Sciences	408	3,249	7.96
2	Journal of Sports Science and Medicine	1,242	8,161	6.57
3	Turkish Journal of Chemistry	1,641	10,689	6.51
4	Diagnostic and Interventional Radiology	711	3,437	4.83
5	Türk Psikoloji Dergisi	256	995	3.89
6	Turkish Journal of Botany	647	2,509	3.88
7	Records of Natural Products	498	1,629	3.27
8	Türk Psikiyatri Dergisi	515	1,752	3.40
9	Turkish Journal of Veterinary & Animal Sciences	2,410	7,732	3.21
10	Turkish Journal of Pediatrics	2,587	8,196	3.17
11	Turkish Journal of Agriculture and Forestry	727	2,577	3.54
12	Turkish Journal of Biology	706	2,380	3.37
13	Atmospheric Pollution Research	508	1,757	3.46
14	Ekoloji	379	1,047	2.76
15	Journal of Clinical Research in Pediatric Endocrinology	267	713	2.67
16	Turkish Journal of Fisheries and Aquatic Sciences	699	1,618	2.31
17	Mikrobiyoloji Bulteni	821	1,869	2.28
18	Experimental and Clinical Transplantation	966	2,014	2.08
19	Turkish Neurosurgery	1,230	2,766	2.25
20	Eklem Hastalıkları ve Cerrahisi	344	724	2.10
21	Turkish Journal of Field Crops	277	544	1.96
22	Acta Orthopaedica et Traumatologica Turcica	850	1,745	2.05
23	Turkish Journal of Zoology	836	1,681	2.01
24	NeuroQuantology	534	937	1.75
25	Ulusal Travma ve Acil Cerrahi Dergisi	961	1,738	1.81
26	Anadolu Kardiyoloji Dergisi	2,306	3,261	1.41
27	Hacettepe Journal of Mathematics and Statistics	648	954	1.47
28	Kafkas Üniversitesi Veteriner Fakültesi Dergisi	1,607	2,335	1.45
29	Turkish Journal of Medical Sciences	1,607	2,239	1.39
30	Turkish Journal of Electrical Engineering and Computer Sciences	1,076	1,380	1.28
31	Journal of the Entomological Research Society	263	364	1.38
32	Turkish Journal of Mathematics	577	799	1.38
33	Eurasia Journal of Mathematics Science and Technology Education	404	456	1.13
34	Hacettepe Üniversitesi Eğitim Fakültesi Dergisi	784	1,011	1.29
35	Eğitim ve Bilim	859	1,091	1.27
36	Tarım Bilimleri Dergisi	432	506	1.17
37	Türkiye Entomoloji Dergisi	317	361	1.14
38	Journal of the Faculty of Engineering and Architecture of Gazi University	770	794	1.03
39	Isı Bilimi ve Tekniği Dergisi	238	243	1.02
40	Tekstil ve Konfeksiyon	494	474	0.96
41	Turkish Journal of Gastroenterology	1,303	2,255	1.73
42	New Perspectives on Turkey	227	202	0.89
43	Ankara Üniversitesi Veteriner Fakültesi Dergisi	514	464	0.90
44	Adalya	202	148	0.73
45	Anadolu Psikiyatri Dergisi	527	492	0.93
46	Turkish Journal of Biochemistry	582	560	0.96
47	Klinik Psikofarmakoloji Bulteni	643	523	0.81
48	Kuram ve Uygulamada Eğitim Bilimleri	744	690	0.93
49	Turkish Journal of Hematology	646	538	0.83
50	UHOD-Uluslararası Hematoloji-Onkoloji Dergisi	378	217	0.57
51	Nöropsikiyatri Arşivi-Archives of Neuropsychiatry	596	344	0.58
52	OLBA	111	56	0.50
53	METU Journal of the Faculty of Architecture	288	167	0.58
54	Teknik Dergi	188	99	0.53
55	Journal of International Advanced Otology	488	279	0.57
56	Turkish Journal of Geriatrics-Türk Geriatri Dergisi	433	207	0.48
57	Turk Göğüs Kalp Damar Cerrahisi Dergisi	1,102	440	0.40
58	TÜRKDERM	545	164	0.30
59	Türkiye Fiziksel Tip ve Rehabilitasyon Dergisi	588	236	0.40
60	Journal of Neurological Sciences-Turkish	719	284	0.39
61	Uluslararası İlişkiler-International Relations	266	95	0.36
62	Balkan Medical Journal	570	353	0.62
63	Nobel Medicus	422	135	0.32
64	Amme İdaresi Dergisi	248	63	0.25
65	Bilig	406	60	0.15
66	Milli Folklor	709	47	0.07
67	Belleten	279	20	0.07
68	Archives of Rheumatology	166	31	0.19
69	Osmanlı Araştırmaları	238	4	0.02

Source: Compiled using CABİM data.

Table G.2.3 World ranking of scientific journals according to SCIMAGO (2015)

Rank	Title	SJR	*h* index	Number of documents (2015)	Number of documents (3 years)	Number of citations (3 years)	Number of cited documents (3 years)	Citations per document (2 years)	Country
1	Nature Reviews Molecular Cell Biology	32,928	324	170	539	7,978	202	37.1	UK
2	Annual Review of Immunology	32,720	254	26	74	2,937	74	35.72	US
3	Nature Reviews Genetics	32,615	267	157	676	8,171	212	36.13	UK
4	CA - A Cancer Journal for Clinicians	32,242	117	43	139	8,650	117	80.54	US
5	Cell	28,188	616	651	1,794	40,673	1,626	23.4	US
6	Annual Review of Astronomy and Astrophysics	27,065	138	16	41	1,373	40	35.04	US
7	Nature Reviews Immunology	26,850	292	163	551	7,353	195	39.23	UK
8	Nature Reviews Cancer	25,467	323	134	554	8,011	214	31.64	UK
9	Annual Review of Biochemistry	24,872	248	35	91	2,398	91	21.76	US
10	Reviews of Modern Physics	24,580	248	36	131	4,240	125	33.39	US
11	Nature Genetics	23,762	469	274	917	19,787	732	27.49	UK
12	Nature	21,936	948	2,653	7,961	109,587	4,055	24.46	UK
13	Nature Methods	21,715	189	358	1,142	16,776	592	21.18	UK
14	Nature Reviews Neuroscience	21,499	309	199	683	6,090	203	28.94	UK
15	Nature Materials	21,395	313	295	734	18,358	536	32.28	UK
16	Quarterly Journal of Economics	20,761	186	41	111	1,026	111	6.97	UK
17	Nature Nanotechnology	19,832	203	250	711	15,523	532	27.09	UK
18	Vital & health statistics. Series 3, Analytical and epidemiological studies	19,215	3	0	1	42	1	0	US
19	Chemical Reviews	19,143	514	275	700	31,537	673	36.84	US
20	Nature Biotechnology	18,932	335	293	1,053	12,420	509	27.08	UK
21	Nature Photonics	18,668	178	198	699	14,509	494	27.07	UK
22	Physiological Reviews	17,564	279	44	110	3,283	105	31.89	US
23	Annual Review of Neuroscience	16,725	200	21	76	1,616	75	14.73	US
24	Nature Reviews Microbiology	16,373	195	174	595	5,505	237	23.75	UK
25	Immunity	16,215	311	239	719	11,663	684	17.62	US
26	Academy of Management Annals	15,472	27	15	29	370	24	14.38	US
27	Chemical Society Reviews	15,228	305	383	1,258	44,442	1,206	33.75	UK
28	National vital statistics reports	14,932	71	12	37	715	37	15.92	US
29	Lancet	14,638	600	2,029	5,746	42,442	1,420	26.55	UK
30	New England Journal of Medicine	14,619	801	2,186	5,542	66,587	2,432	27.78	US
31	Journal of Finance	14,546	213	77	207	1,235	202	5.33	UK
32	Genome Research	14,352	232	178	633	8,697	617	11.59	US
33	Nature Cell Biology	14,131	294	187	612	7,326	497	14.77	UK
34	Nature Medicine	13,959	439	298	1,277	15,242	770	21.06	UK
35	Lancet Oncology	13,940	197	590	1,453	14,464	528	25.16	UK
36	Cancer Cell	13,922	249	185	549	8,645	519	15.1	US
37	Annual Review of Genetics	13,880	152	30	83	1,194	83	12.53	US
38	Annual Review of Cell and Developmental Biology	13,778	182	33	74	1,243	72	13.5	US
39	Molecular Cell	13,658	316	405	1,153	12,870	1,081	12.06	US
40	Annual Review of Pathology: Mechanisms of Disease	13,647	82	19	53	1.125	53	22.8	US
41	Nature Neuroscience	13,558	325	326	957	11.932	797	15.44	UK
42	Nature Physics	13,522	179	300	766	7.980	484	15.01	UK
43	Rhinology. Supplement	13,405	6	0	2	43	2	10	Netherlands
44	Nature Immunology	13,253	302	198	656	7.849	520	14.68	UK
45	Science	13,217	915	2,106	6,886	88.010	4,837	18.05	US
46	Cell Stem Cell	13,121	161	191	620	7.837	553	14.06	US
47	Annual Review of Plant Biology	13,038	199	24	89	2.103	88	23.2	US
48	Annual Review of Condensed Matter Physics	12,989	30	18	45	718	44	17	US
49	Annual Review of Psychology	12,856	181	7	71	1.727	69	20.43	US
50	Nature Structural and Molecular Biology	12,548	222	178	682	6.513	600	11.19	UK

Source: SCIMAGO (2017)

In terms of the number of citations, Türk Kimyacı Dergisi [Turkish Journal of Chemists] (10,689 citations), Türk Pediatri Dergisi [Turkish Journal of Paediatrics] (8,196 citations), Spor Bilimleri ve Tıp Dergisi [Journal of Sports Sciences and Medicine] (8,161 citations), Veterinerlik ve Hayvan Bilimleri Dergisi [Journal of Veterinary and Zoology] (7,732 citations), and Teşhis ve Girişimsel Radyoloji [Journal of Diagnostic and Interventional Radiology] (3,473 citations) are the most prominent. When journals are examined according to their average impact factor (number of citations divided by number of publications), Türk Dünyası Bilimleri Dergisi [Journal of Turkic World Sciences] has an average of 8 citations per publication, Spor Bilimleri ve Tıp Dergisi [Journal of Sports Sciences and Medicine] 6.6, Türk Kimyacı Dergisi [Turkish Journal of Chemists] 6.5, Teşhis ve Girişimsel Radyoloji [Journal of Diagnostic and Interventional Radiology] 4.8 and Türk Psikoloji Dergisi [Turkish Journal of Psychology] 3.9 citations per publication.

Created by SCImago to rank scientific journals around the world, journals' world rankings according to the SCImago Journal Rank (SJR) indicator are shown in Table G.2.3. The top 50 journals included in the SJR, that includes around 30,000 registered scientific journals, consists mostly of journals originating from the US (25 journals) and the UK (24 journals). Most of these journals are about medical sciences. The top 3 journals according to SJR indicator are Nature Reviews Molecular Cell Biology, Annual Review of Immunology, and Nature Reviews Genetics.

As previously mentioned, the *h* index considers the number of times a researcher's publications are cited. In this respect, the journal Nature, ranking 12th overall, has the highest *h* index (948), most documents and citations within a 3-year period, 7,961 and 109,587, respectively (Table G.2.3). In terms of the number of citations per document within a 2-year period, ranking 4*th* overall, CA - A Cancer Journal for Clinicians places first with 80.5 citations per document.

Table G.2.4 indicates the rankings of Turkey-based scientific journals on the SJR indicator. The top 50 Turkey-based scientific journals were included in the table. It can be seen that these journals rank between 4,000 and 14,000. According to the SJR indicator, there are 10 Turkey-based journals among the top 10,000 worldwide.

Ranking 12,218th on SJR, Türk Kimyacı Dergisi [Turkish Journal of Chemists] has the highest *h* index (36) among Turkey-based scientific journals (G.2.4). While Anadolu Kardiyoloji Dergisi [Anatolian Journal of Cardiology] has the highest number of documents (865), the most cited Turkey-based journal is Spor Bilimleri ve Tıp Dergisi [Journal of Sports Sciences and Medicine] with 558 citations. On the other hand, Çocuk Endokrinolojisinde Klinik Araştırmalar Dergisi [Journal of Clinical Research on Paediatric Endocrinology] is also prominent with its average of 1.7 citations per document in a 2-year period.

Table G.2.4 World rankings of Turkey-based journals according to SCIMAGO (2015)

Rank	Title	SJR	*h* index	Number of documents (2015)	Number of documents (3 years)	Number of citations (3 years)	Number of cited documents (3 years)	Citations per document (2 years)
4.121	Atmosfer Kirliliği Araştırmaları	1,022	14	125	201	365	194	1.56
6.632	Spor Bilimleri ve Tıp Dergisi	0,682	37	86	379	558	352	1.49
6.935	Türk Dünyası Bilimleri Dergisi	0,648	27	29	142	211	137	1.24
6.951	JCRPE Çocuk Endokrinolojisinde Klinik Araştırmalar Dergisi	0,647	17	85	164	288	155	1.72
7.601	Teşhis ve Girişimsel Radyoloji	0,586	28	84	260	435	249	1.62
8.706	Avrupa Diş Doktoru Dergisi	0,496	11	100	244	284	242	1.12
8.927	Türk Tarım ve Ormancılık Dergisi	0,481	27	97	268	324	268	1.26
9.672	Anadolu	0,433	14	84	159	93	112	0.58
9.800	Türk Biyoloji Dergisi	0,426	25	106	281	354	280	1.23
9.843	Doğa, Botanik Dergisi	0,423	26	102	315	378	313	1.28
10.188	Avrasya Matematik, Fen ve Teknoloji Öğretmenliği Dergisi	0,401	19	114	128	119	125	0.89
10.364	Doğal Ürünler Kayıtları	0,392	18	111	175	197	174	0.97
10.434	EurAsian Journal of BioSciences	0,388	2	8	19	23	19	1.21
10.585	Uluslararası Matematik Eğitim Elektronik Dergisi	0,380	5	17	22	9	21	0.41
10.634	Türk Eğitim Teknolojileri Dergisi	0,377	18	486	311	199	310	0.52
10.966	Tekstil ve Konfeksiyon	0,361	7	53	177	73	166	0.31
11.003	Eğitim ve Bilim	0,359	9	119	387	139	381	0.36
11.261	Insight Turkey	0,347	12	27	134	68	91	0.89
11.418	Mikrobiyoloji Bülteni	0,340	15	52	254	181	250	0.73
11.516	Uluslararası Enerji Ekonomisi ve Politikası Dergisi	0,336	11	107	167	219	167	1.2
11.684	Türk Zooloji Dergisi	0,329	20	156	293	220	293	0.8
11.688	Ekoloji	0,329	11	25	124	87	124	0.59
11.689	Tarla Bitkileri Dergisi	0,329	9	36	113	70	113	0.45
11.733	Uygulamalı Termodinamiğin Uluslararası Dergisi	0,327	22	28	88	61	82	0.57
11.742	Uluslararası Çevre ve Fen Eğitimi Dergisi	0,326	11	55	90	62	87	0.64
11.982	Madencilik	0,316	5	0	12	1	12	0.08
12.112	Türk Elektrik Mühendisliği ve Bilgisayar Bilimleri Dergisi	0,311	18	133	385	273	384	0.59
12.148	Acta Orthopaedica et Traumatologica Turcica	0,309	16	125	310	186	281	0.48
12.218	Türk Kimyacısı Dergisi	0,306	36	104	269	325	268	1.16
12.239	Kafkas Üniversitesi Veteriner Fakültesi Dergisi	0,305	11	152	552	253	546	0.42
12.270	Eğitim Araştırmaları	0,304	8	49	93	51	92	0.82
12.293	Deneysel ve Klinik Transplantasyon	0,303	18	231	401	267	364	0.65
12.317	Türk Su Ürünleri ve Su Bilimleri Dergisi	0,302	14	97	280	192	280	0.61
12.332	Tarım Bilimleri Dergisi	0,301	7	61	108	48	108	0.42
12.346	Türk Pediatri Dergisi	0,301	28	64	381	265	347	0.63
12.362	Eklem Hastalıkları ve Cerrahisi	0,300	9	37	121	87	110	0.85
12.364	Türk Nöroşirürji	0,300	16	180	518	349	488	0.57
12.388	Organik İletişim	0,299	9	17	53	46	51	0.61
12.408	Uluslararası Yenilenebilir Enerji Araştırmaları Dergisi	0,298	11	140	381	307	381	0.61
12.647	Türk Matematik Dergisi	0,290	17	83	229	93	228	0.4
12.927	Nörokültüroloji	0,279	13	51	189	126	177	0.69
13.144	Anadolu Kardiyoloji Dergisi	0,272	19	370	865	342	406	0.98
13.261	Hacettepe Matematik ve İstatistik Dergisi	0,267	12	0	185	78	184	0.34
13.492	Uzaktan Eğitim Dergisi	0,260	13	49	289	81	279	0.19
13.501	Türk Fizik Dergisi	0,260	19	34	149	77	147	0.57
13.606	Türk Gastroenteroloji Dergisi	0,257	21	130	629	282	418	0.49
13.649	Entomolojik Araştırma Topluluğu Dergisi	0,255	7	19	108	40	108	0.31
13.658	Uluslararası Öğretim Dergisi	0,255	3	29	58	22	55	0.4
13.735	Türk Patoloji Dergisi	0,252	6	58	144	85	136	0.62
14.070	Türk Psikiyatrı Dergisi	0,243	19	50	122	50	106	0.4

Source: SCIMAGO (2017)

INDICATOR G3

NATIONAL and INTERNATIONAL UNIVERSITY RANKINGS

Many institutions rank universities according to various criteria. These criteria include international publications, cited publications, number of students, number of academic staff, gender distribution among students, number of international students, number of projects, and industry income. In this section, World University and Asia University Rankings conducted by Times Higher Education (THE) and University Ranking by Academic Performance index (URAP) published by METU's Informatics Institute are analysed.

THE has been ranking world universities for 7 years and Asia for 5 years. World university ranking for the 2016-2017 period included 981 universities from 79 countries and 13 different indicators that can be classified into 5 different categories: education, research, citation, international outlook and industry income. Table G.3.1 shows the top 11 world universities and the top 17 Turkish universities. According to the rankings, the top 11 consists of 3 British universities, 7 American and 1 Swiss. According to the data, the University of Oxford is first, California Institute of Technology is second and Stanford University is third in this ranking. Koç University ranked between 251-300, while Sabancı University between 301-350, Bilkent University between 351-400, Atılım and Boğaziçi universities between 401-500, İTÜ between 501-600, Hacettepe, Istanbul, METU, TOBB ETÜ, and İzmir Institute of Technology between 601-800. Meanwhile Anadolu, Ankara, Erciyes, Gazi, Marmara and Yıldız universities ranked between 801-981. In general, with the exception of Berkeley, the number of students at the top 10 universities are fairly low (ranging between 2,000-20,000). On the other hand, these universities have a high rate of international students (16-52%). In addition, the student-faculty ratio is also low (6-15).

There is another THE ranking intended for Asian countries. Similar to the world university rankings, it consists of 13 different indicators under 5 different categories including education, research, citations, international outlook and industry income. 298 universities from 24 countries were evaluated in 2017. Table G.3.2 shows the top 10 countries in THE Asia University Rankings for 2016-2017, along with 17 Turkish universities that made the list. According to the table, the top 10 consists of universities from Singapore, China, Hong Kong, Japan and South Korea. Singapore National University ranked first. The other 4 universities among the top 5 are: Peking University (China), Tsinghua University (China), Nanyang Technological University (Singapore) and the University of Hong Kong (Hong Kong). In terms of Turkish universities, Koç University ranked 27th, Sabancı University 33rd, Bilkent University 46th, Boğaziçi University 52nd, Atılım University 64th and İTÜ 79th. Meanwhile, METU ranked between 101-110, Hacettepe and Istanbul universities between 161-171, İzmir Institute of Technology between 191-200, Erciyes, TOBB ETÜ and Yıldız Technical universities between 201-250, and Anadolu, Ankara, Gazi and Marmara universities ranked between 251-298.

University Ranking by Academic Performance (URAP) Research Laboratory at METU Informatics Institute has been ranking universities in Turkey with 9 indicators for 8 years using Web of Science and BHE data. These indicators are the following: number of articles, number of articles per faculty, citations, number of citations per faculty, total number of scientific documents, number of scientific documents per faculty, number of doctorate graduates, rate of doctorate students and the number of students per fac-

Table G.3.1 Times Higher Education World University Rankings (2016-2017)

Rank	University	Number of students	Student-staff ratio	Rate of international students (%)	Female-Male ratio	Total score	Citations	Industry income	International outlook	Research	Teaching
1	University of Oxford (England)	19,718	11	35	46:54	95	99.2	62.5	94.5	99.1	89.6
2	California Institute of Technology (US)	2,181	6.7	27	31:69	94.3	99.8	90.8	63.4	95.7	95.5
3	Stanford University (US)	15,658	7.7	22	42:58	93.8	99.9	60.9	76.5	95.9	92.6
4	Cambridge Üniversitesi (İngiltere)	18,655	11.3	35	45:55	93.6	96.8	50.4	92.4	97.2	90.6
5	Massachusetts Institute of Technology (US)	11,192	8.8	34	37:63	93.4	99.9	88.4	85.6	92.3	90.3
6	Harvard University (US)	19,890	8.8	25		92.7	99.7	47.3	77.9	98.3	87.5
7	Princeton University (US)	7,925	8.4	23	45:55	90.2	99.2	49.9	77.2	88.4	89.5
8	Imperial College London (İngiltere)	15,236	11.3	52	37:63	90	97.3	67.5	96.5	86.6	86.4
9	ETH Zürich	18,616	14.9	37	31:69	89.3	92.5	63.7	98.1	93.7	81.5
10	University of California, Berkeley (US)	34,834	12	16	52:48	88.9	99.8	37.6	59.6	96.1	82.4
10	University of Chicago (US)	13,486	6.2	24	42:58	88.9	99.1	37.7	67.8	89.1	88.1
251-300	Koç University	4,793	14.6	10	52:48	43.5-46.2	70.3	81.9	54.4	29.8	25.2
301-350	Sabancı University	2,999	17.7	8	39:61	40.7-43.3	61.6	77.7	46.7	32.9	24.3
351-400	Bilkent University	9,761	14.1	4	46:54	37.6-40.6	68.3	39.7	51.9	19.9	23.4
401-500	Atılım University	6,394	27.2	8		32.6-37.5	75.3	47.9	33.3	8.1	19
401-500	Boğaziçi University	11,555	25.6	7	50:50	32.6-37.5	57.7	57.4	45.4	23.8	20.9
501-600	İTÜ	34,649	16.6	5	33:67	27.6-32.5	32.4	100	24.8	24.6	24
601-800	Hacettepe University	38,109	18.2	5	57:43	18.6-27.5	36.5	32.6	21.9	10.5	20.3
601-800	İstanbul University	90,614	43.8	6	49:51	18.6-27.5	11.8	52.4	22.2	23.6	22.5
601-800	İzmir Institute of Technology	4,201	19	4	45:55	18.6-27.5	25.2	42.5	29.2	9	17.7
601-800	METU	26,355	23.3	7	44:56	18.6-27.5	31.4	58.8	27.8	19.5	27.3
601-800	TOBB ETÜ	4,506	17.6	1	42:58	18.6-27.5	28.3	32.4	30.1	10.6	13.6
801+	Anadolu University					<18.5	15.3	39.3	15.1	8.9	10.9
801+	Ankara University	59,554	16.4	4	53:47	<18.5	10.4	32.6	18.8	5.3	18
801+	Erciyes University	31,185	24.2	3	46:54	<18.5	26.6	37.1	19.8	10.1	15.4
801+	Gazi University	76,768	25	3	49:51	<18.5	9.6	36.8	14.5	9.1	17.5
801+	Marmara University	66,212	32.6	4	50:50	<18.5	10.4	32.1	19.8	3.2	14.8
801+	Yıldız Technical University	34,417	28.3	4	37:63	<18.5	22.5	44.7	18.5	8.1	13.6

Source: Compiled using Times Higher Education World University Rankings 2017 data.

Table G.3.2 Times Higher Education Asia University Rankings (2017)

Rank	University	Number of students	Student-staff ratio	Rate of international students (%)	Female-Male ratio	Total score	Citations	Industry income	International outlook	Research	Teaching
1	Singapore National University (Singapore)	31,111	16.7	32	50:50	80.6	79.7	61.3	96	87.4	74.7
2	Peking University (China)	42,977	8.8	15	48:52	77.5	71.6	100	50.3	79.7	83.2
3	Tsinghua University (China)	41,537	14.1	10	32:68	76.8	67.4	99.7	39.4	89.8	76.6
4	Nanyang Technological University (Singapore)	25,278	16.1	32	49:51	74.2	90.7	93.5	95.7	65.4	52.9
5	University of Hong Kong (Hong Kong)	20,095	17.8	39	51:49	73.7	73.2	52.9	99.4	78.7	66.9
6	Hong Kong Bilim ve Teknoloji Üniversitesi (Hong Kong)	11,960	27.3	38		73.5	91.2	62	82.8	71.8	54.9
7	University of Tokyo (Japan)	26,080	7	10		71.4	62.4	53.4	30.6	87.2	80.7
8	Korea Advanced Institute of Science & Technology (KAIST) (South Korea)	9,327	9.5	9	20:80	66.4	78.5	100	34.3	58.6	60.9
9	Seoul National University (South Korea)	26,777	13.1	11		66.1	58.8	85.2	32.4	72.9	71.3
10	Pohang University of Science and Technology (South Korea)	3,017	10	4	22:78	66	79.2	99.6	34.2	56.5	61
27	Koç University	4,793	14.6	10	52:48	49.5	70.3	81.9	54.4	36.3	29.1
33	Sabancı University	2,999	17.7	8	39:61	47.2	61.6	77.7	46.7	40.7	28.8
46	Bilkent University	9,761	14.1	4	46:54	40.7	68.3	39.7	51.9	22.7	26
52	Boğaziçi University	11,555	25.6	7	50:50	39.2	57.7	57.4	45.4	28.2	23
64	Atılım University	6,394	27.2	8		37.4	75.3	47.9	33.3	10.1	22.8
79	İTÜ	34,649	16.6	5	33:67	34.8	32.4	100	24.8	29.7	27.3
101-110	METU	26,355	23.3	7	44:56	29.4-30.7	31.4	58.8	27.8	21.4	28.9
161-170	Hacettepe University	38,109	18.2	5	57:43	23.9-24.4	36.5	32.6	21.9	12.1	23
161-170	İstanbul University	90,614	43.8	6	49:51	23.9-24.4	11.8	52.4	22.2	28.6	25.8
191-200	İzmir Institute of Technology	4,201	19	4	45:55	21.4-22.7	25.2	42.5	29.2	11	21.2
201-250	Erciyes University	31,185	24.2	3	46:54	18.2-21.3	26.6	37.1	19.8	12.5	18.4
201-250	TOBB EETÜ	4,506	17.6	1	42:58	18.2-21.3	28.3	32.4	30.1	13.2	16.3
201-250	Yıldız Technical University	34,417	28.3	4	37:63	18.2-21.3	22.5	44.7	18.5	10.1	16.3
251+	Anadolu University					<18.2	15.3	39.3	15.1	10.9	12.8
251+	Ankara University	59,554	16.4	4	53:47	<18.2	10.4	32.6	18.8	5.7	20.7
251+	Gazi University	76,768	25	3	49:51	<18.2	9.6	36.8	14.5	10.9	20.5
251+	Marmara University	66,212	32.6	4	50:50	<18.2	10.4	32.1	19.8	3.8	17.6

Source: Compiled using Times Higher Education Asia University Rankings 2017 data.

ulty. Moreover, URAP also ranks the top 2,000 universities in the world according to six academic productivity indicators. These indicators are the number of publications, number of citations, total number of scientific documents, total publication factor, total citation factor and international collaboration. Universities' Scientific publications are once again at the core of the indicators.

Table G.3.3 shows the top 15 universities in the world and the top 15 Turkish universities that made the list according to URAP 2016-2017 World Ranking. 71 universities from Turkey were able to rank within the top 2,000 universities. According to the rankings, 10 American, 4 British and 1 Canadian universities constituted the top 15. Harvard University ranked first, University of Toronto ranked second, University of Oxford ranked third, Stanford University ranked fourth and University College London ranked fifth. The rankings of the top 15 Turkish universities on URAP World Rankings are almost the same as the scientific publication rankings provided in Table G.3.4. Similar to other rankings, this indicates that URAP rankings are closely related to the number of publications.

In the *State of Turkish Universities in 2016 General World Rankings*, a report published by METU's Informatics Institute URAP Laboratory (2017), the general status of 159 universities in Turkey is evaluated through various ranking institutions. Table G.3.4 provides the status of Turkish universities in the general world rankings. According to the data, Istanbul University was present in every ranking. Meanwhile, METU, Hacettepe, İTÜ, Ankara and Gazi universities entered the rankings of many ranking institutions. **Istanbul, METU, Hacettepe, İTÜ, Boğaziçi, İ.D. Bilkent, Koç, Ege, Sabancı and Atılım universities were able to rank among the top 500 in at least one of the various rankings.**

Table G.3.3 URAP World University Rankings (2016-2017)

Rank	University	Score
1	Harvard University (US)	600,00
2	University of Toronto (Canada)	572,53
3	University of Oxford (England)	547,93
4	Stanford University (US)	534,41
5	University College London (England)	531,41
6	Johns Hopkins University (US)	530,22
7	Massachusetts Institute of Technology (US)	525,69
8	University of Cambridge (England)	522,07
9	University of California, Berkeley (US)	516,55
10	University of Michigan (US)	510,68
11	University of Washington (US)	506,37
12	University of California, Los Angeles (US)	501,59
13	University of Pennsylvania (US)	491,83
14	Columbia University (US)	486,70
15	Imperial College London (England)	479,64
515	İstanbul University	316,16
528	METU	315,43
546	Hacettepe University	314,55
552	İTÜ	314,29
600	Ege University	312,13
618	Ankara University	311,63
648	Gazi University	310,60
671	Boğaziçi University	309,73
830	Erciyes University	305,37
865	İ.D. BilkentUniversity	304,69
889	Dokuz Eylül University	303,89
895	Marmara University	303,76
902	Selçuk University	303,54
929	Yıldız Technical University	302,92
963	Atatürk University	302,21

Source: Compiled using URAP 2016-2017 World University Rankings data.

Table G.3.4 General status of Turkish universities in world rankings (2016)

Rank	University	Webometrics	URAP	US News & World Report	QS	Times Higher Education	Leiden	CWUR	RUR	ARWU	Total
1	İstanbul	710	515	619	700	700	353	652	540	450	9
2	METU	456	528	231	476	700	501	525	341		8
3	Hacettepe	764	546	550	700	700	452	668	587		8
4	İTÜ	513	552	257	676	550	575	700	416		8
5	Ankara	743	618	557	700	801	612	720	580		8
6	Gazi	902	648	760	700	801	554	857	642		8
7	Boğaziçi	629	671	166	476	450		813	418		7
8	İ.D. Bilkent	678	865	389	416	375		828	357		7
9	Koç	919	998	576	456	275			466		6
10	Ege	796	600	593			482	761			5
11	Erciyes	1,166	830	933		801	686				5
12	Dokuz Eylül	1,065	889	942			715	954			5
13	Marmara	1,296	895	888		801			677		5
14	Yıldız Technical	1,235	929	718		801			680		5
15	Sabancı	1,006	1,250		446	325			339		5
16	Atatürk	1,282	963	999			761				4
17	Çukurova	1,261	1,036	700	700						4
18	Selçuk	1,335	902				717				3
19	Fırat	1,567	1,020	999							3
20	Akdeniz	1,518	1,090	992							3
21	Süleyman Demirel	1,432	1,091	829							3
22	KTÜ	1,220	1,102				806				3
23	Anadolu	770	1,246			801					3
24	Gaziantep	1,503	1,267	831							3
25	Mersin	1,875	1,361	706							3
26	Gaziosmanpaşa	2,089	1,432	838							3
27	İzmir Institute of Technology	1,511	1,489			700					3
28	TOBB ETÜ	1,410	1,593			700					3
29	Atılım	1,963	1,623			450					3
30	Adnan Menderes	2,143	1,724	999							3

Source: Compiled using data from the *State of Turkish Universities in 2016 General World Rankings* report (March 2017) published by METU Informatics Institute URAP Laboratory. SCIMAGO rankings were not included to the table.

INDICATOR G4

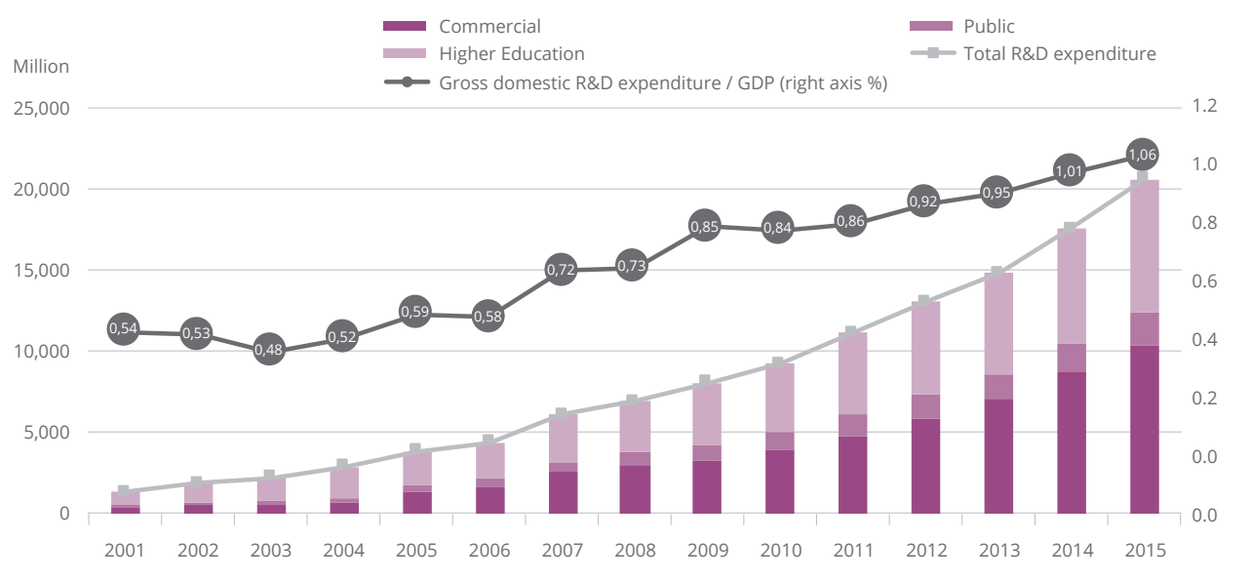
R&D IN HIGHER EDUCATION

Another prominent indicator of the higher education performance is Research & Development (R&D). R&D expenditure and human resources were analysed via the Research & Development Activity Report data published by TURKSTAT on November 18 2016. After providing the number of higher education patent applications, universities rankings on TÜBİTAK's Entrepreneurial and Innovative University Index are discussed.

The aforementioned R&D Activity Report by TURKSTAT is prepared according to the budget and personnel roster of public universities and based on survey results for public institutions, foundation universities and the commercial sector. Figure G.4.1 shows the trends in gross domestic R&D expenditures according to sectors and its ratio to the GDP. The data indicates that gross domestic R&D expenditure has steadily increased over the years. R&D expenditures in 2015 reached TL 20.615 billion with a 17.1% increase. Analysing R&D expenditure's share in the GDP, it can be seen that this share has steadily increased since 2011. While the gross domestic R&D expenditure's represented 0.54% in 2001, it reached 1.06% in 2015.

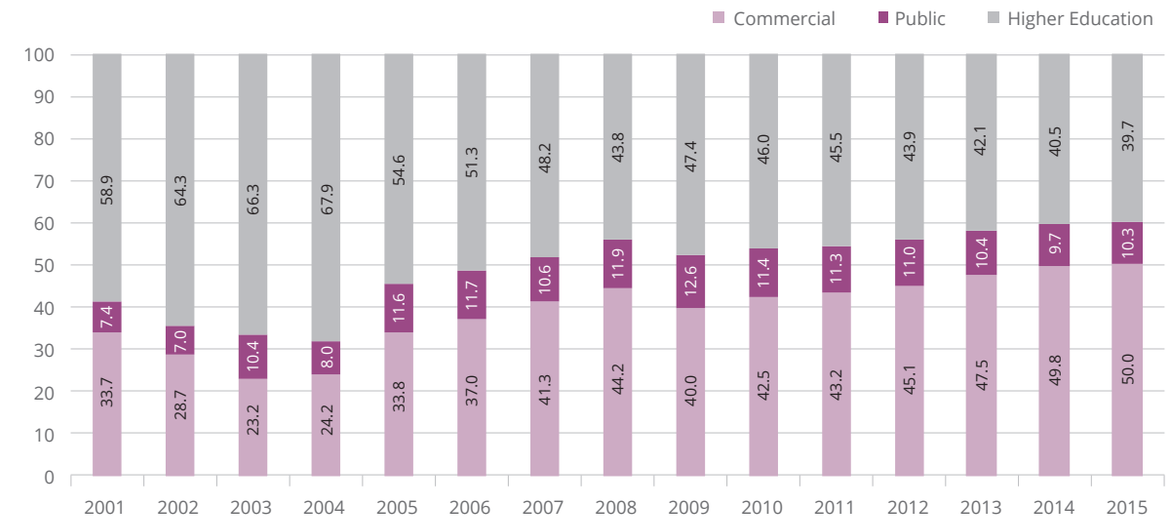
Figure G.4.2 shows the trends in the proportional distribution of gross domestic R&D expenditures according to different sectors between the years 2001 and 2015. It would be more beneficial to separate the table into two different periods. According to the data, the share of the commercial sector within total R&D expenditures declined between the years 2001-2004, while higher education's share increased. On the other hand, between the years 2005-2015, the commercial sector's share in the total R&D expenditures steadily increased, while higher education's share declined. Meanwhile, the public sector's share in total R&D expenditures has remained stable from 2005 onwards. In 2015, the commercial sector had the highest share in gross domestic R&D expenditure with 50%; this is followed by higher education with 39,7% and public sector with 10.3% (TURKSTAT, 2016).

Figure G.4.1 Trends in gross domestic R&D expenditures according to sectors and its ratio to the GDP (2001-2015)



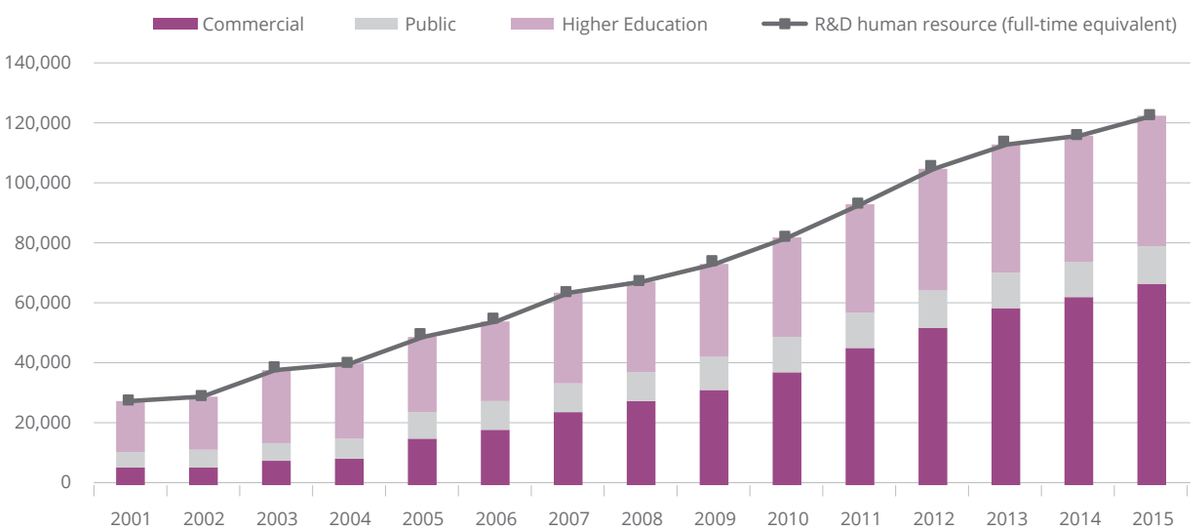
Source: Compiled using TURKSTAT's R&D Activity Report data.

Figure G.4.2 Trends in the proportional distribution of gross domestic R&D expenditures by sector (2001-2015)



Source: Compiled using TURKSTAT's R&D Activity Report data.

Figure G.4.3 Trends in the number of R&D personnel by sectors (2001-2015)

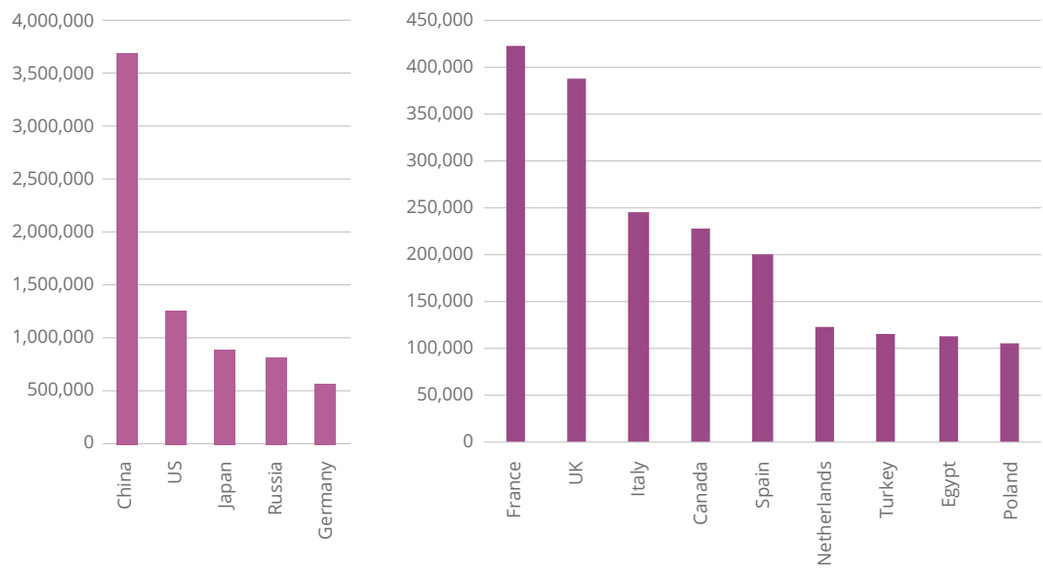


Source: Compiled using TURKSTAT's R&D Activity Report data.

Figure G.4.3 shows the trends in the number of R&D personnel by sector between the years 2001-2015. According to the data, the number of R&D personnel in the form of full-time equivalent has increased 120% over 10 years, surpassing the 122,000 mark. It can be seen that the rise in the number of R&D personnel in 2015 was 5.9%. In terms of distribution, according to 2015 data, 54.5% of the total R&D personnel is employed in the commercial sector, while 35.4% are employed in higher education and 10.1% in the public sector. The distribution of R&D personnel to sectors in the form of full-time equivalent is similar to the distribution of R&D expenditure by sector.

Figure G.4.4 displays the numbers of R&D personnel in certain select countries in 2014. According to the data, China has 3,700,000 R&D personnel, the US has 1,265,000, Japan has 895,000, Russia has 829,000, Germany has 601,000, France has 422,000 and Turkey has 115,000. It can be asserted that countries with an advanced economy and technology have higher numbers of R&D personnel.

Figure G.4.4 Numbers of R&D personnel in select countries (2014)

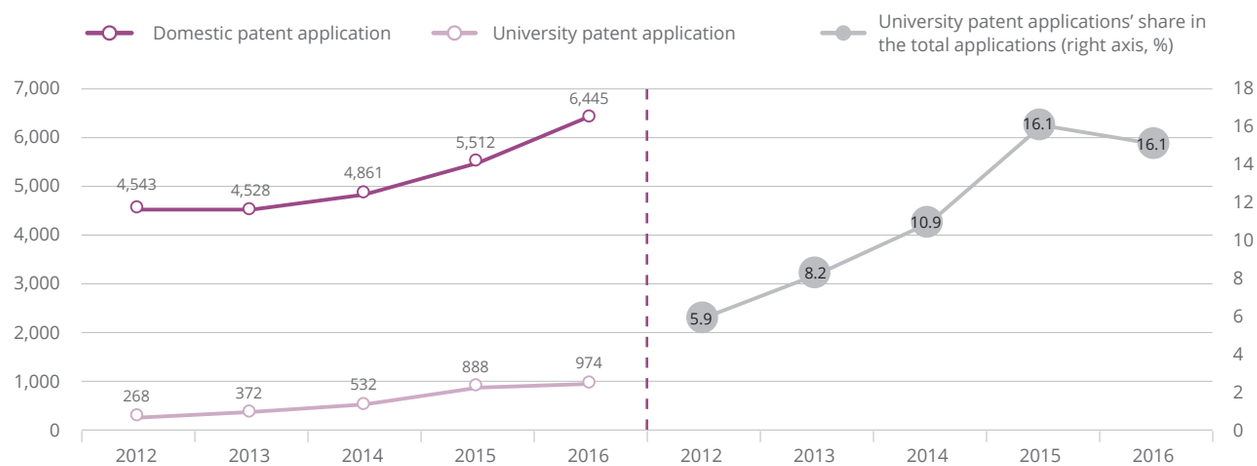


Source: Compiled by using UNESCO and OECD data.
Note: Canada's data is from 2013.

Figure G.4.5 Trends in the proportional distribution of higher education R&D expenditure by type of expense (%) (1990-2015)

Source: Compiled using TURKSTAT's R&D Activity Report data.

Figure G.4.6 Trends in the number of university domestic patent applications and the total number of patent applications (2012-2016)

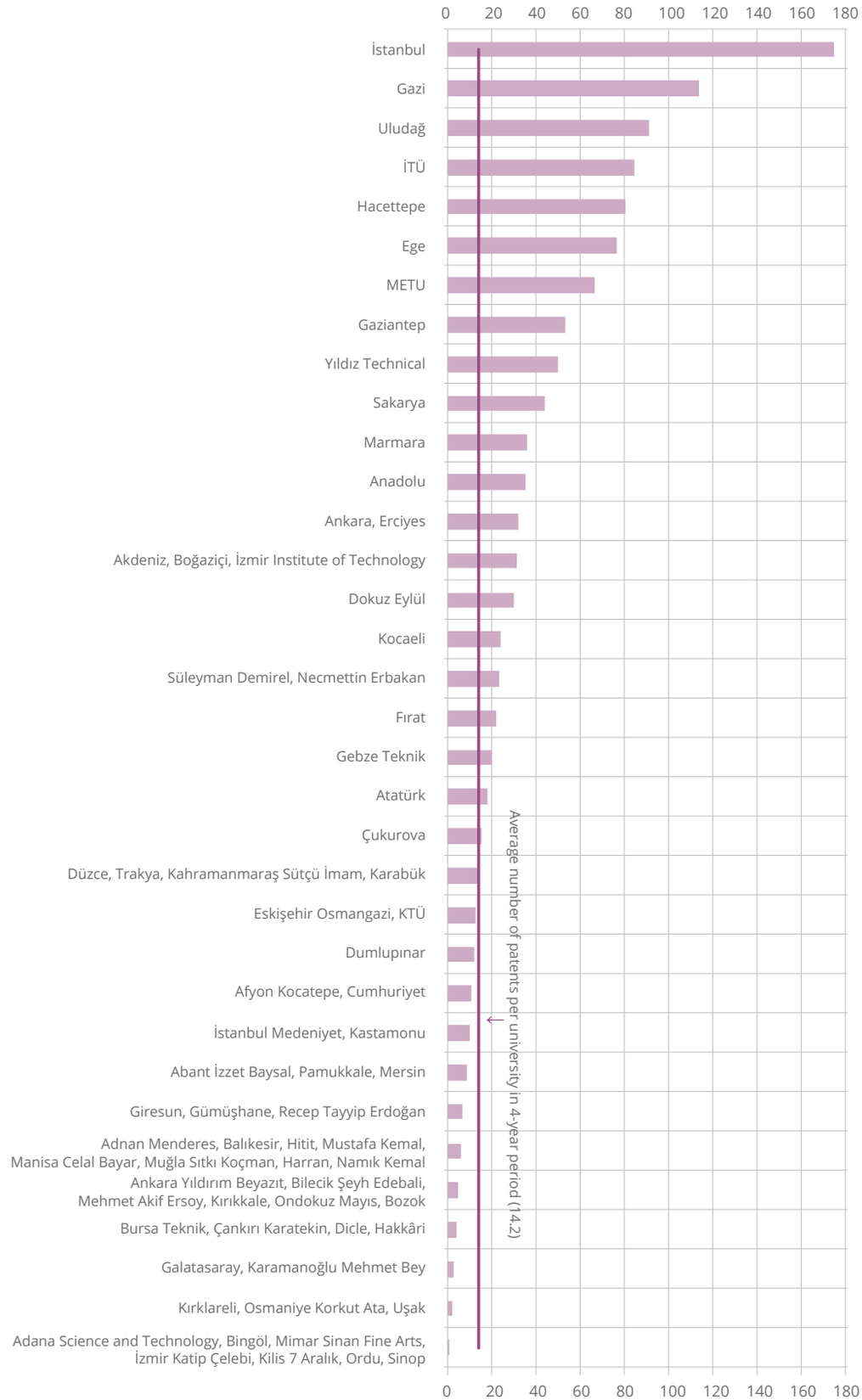


Source: Compiled using TURKPATENT data.

Figure G.4.5 shows the trends in the proportional distribution of higher education R&D expenditures by type of expense between the years 1990 and 2015. The graph indicates that the current expenditure's share fluctuated over the years, shifting between 85-90% in the last few years. While current expenditures include personnel and various other current expenses, investment expenditures include machinery, equipment and facility expenses. In this respect, approximately 90% of the R&D expenditures were used for personnel and various other current expenses.

With the Statutory Decree No.544 passed in 1994, the Turkish Patent Institute (TPE) was founded as a subsidiary of the Ministry of Industry and Commerce. In 2016, it was renamed as the Turkish Patent and Trademark Office (TURKPATENT) with the Industrial Property Law No.6769 (TURKPATENT, 2017). Turkey-based patent applications (national and international) are made through TURKPATENT. Figure G.4.6 demonstrates the number of patent applications made by universities and their share of the total number of domestic patent applications. According

Figure G.4.7 Total number of national patent applications made by public universities (2012-2015)



Source: Compiled using TURKPATENT Patent Vadisi [Patent Valley] data.
Note: The average number of national patent applicants was calculated for 108 public universities.

to the data, while the number of patent applications made by universities was 268 in 2012, it reached 974 in 2016, steadily increasing every year. On the other hand, while the share of patent applications made by universities was 5.9% in 2012, it increased until 2015, reaching 16.1%. In 2016, this rate experienced a slight decline, decreasing to 15.1%.

Figure G.4.7 shows the total number of national patent applications made by public universities between the years 2012-2015. Domestic patent applications include both national and international patent applications that originate from Turkey. Foundation university data was not included in this graph; 306 patent applications were submitted by foundation universities between the years 2012-2015. During the same period, 72 public universities submitted 1,837 national patent applications. On the other hand, 36 public universities did not submit any patent applications. Istanbul University submitted the most patent applications during the 2012-2015 period, followed by Gazi University (113), Uludağ University (91), İTÜ (84), Hacettepe University (80), Ege University (76), METU (66), Gaziantep University (56) and Yıldız Technical University (50). The average number of patents per university in the 4 - year period is 14.2, which translates to 3.5 patents annually.

In order to assess the patent performance of Turkish universities, it is better to compare them with international institutions, rather than national ones. The Patent Cooperation Treaty (PCT) is a regulation which allows the creator of a patent to protect their inventions in other countries. As it is advantageous in terms of fees and procedures, the PCT is a preferred international application method (TURKPATENT, 2017). Table G.4.8 shows the rankings of corporations and universities that submit patent applications through PCT. According to the data, technology companies were the primary PCT applicants in 2016. While Chinese technology companies ZTE and Huawei ranked first and second, respectively, US-based Qualcomm ranked third. In terms of universities, it can be seen that universities in the US lead in patent applications. University of California (35th) has 434, Harvard University (120th) 162, Johns Hopkins University (125th) 158 and University of Texas System (136th) made 152 international patent applications. The only entry from Turkey was Koç University which ranked 1687th with 13 international patent applications.

It can be seen that the companies with the most patent applications originate from countries with large economies (Table G.4.8). It is not possible to assert that Turkey is at the desired level of technological development and number of patents.

Table G.4.9 shows the top 5 universities and public institutions from countries with the most patent applications between the years 2010-2013. According to the table, universities in China, the leading patent applicant, are prominent. Between the years 2010 and 2013, Zheijang University in China made 9,488 patent applications, while Claude Bernard University in France made 171, TU Dresden 257, University of Tokyo in Japan 1,478, Yonsei University in South Korea 2,275 and North-western University in the US

Table G.4.8 PCT application world rankings (2016)

Rank	Applicant	Country	PCT applications
1	ZTE	China	4,123
2	Huawei	China	3,692
3	Qualcomm	US	2,466
4	Mitsubishi	Japonya	2,053
5	LG	South Korea	1,888
6	Hewlett-Packard	US	1,742
7	Intel	US	1,692
8	Boe	China	1,673
9	Samsung	South Korea	1,672
10	Sony	Japan	1,665
11	Ericsson	Sweden	1,608
12	Microsoft	US	1,528
35	University of California	US	434
120	Harvard University	US	162
125	Johns Hopkins University	US	158
136	University of Texas System	US	152
174	Seoul National University	South Korea	122
198	University of Tokyo	Japan	108
208	Stanford University	US	104
220	Hanyang University	South Korea	101
234	University of Florida	US	97
239	University of Pennsylvania	US	96
245	University of Michigan	US	94
262	Shenzhen University	China	87
1687	Koç University	Turkey	13

Source: Compiled by using the WIPO Statistics, Data Centre (March 2017).

Table G.4.9 Universities and public institutions with the most patent applications (2010-2013)

Applicant public institutions	Country	2010	2011	2012	2013	Total
Zheijang University	China	2,111	2,217	2,380	2,780	9,488
Tsinghua University	China	1,643	1,779	2,125	2,060	7,607
Harbin Institute of Technology	China	1,168	1,146	1,574	2,065	5,953
Shanghai Jiao Tong University	China	1,135	1,338	1,573	1,763	5,809
Southeast University	China	961	1,304	1,433	1,939	5,637
Alternative Energies and Atomic Energy Commission	France	585	634	665	731	2,615
National Centre for Scientific Research	France	484	485	516	532	2,017
National Institute of Health and Medical Research	France	58	129	119	172	478
Claude Bernard University	France	39	31	52	49	171
National Centre for Space Studies	France	34	41	45	38	158
Fraunhogfer Society	Germany	434	441	491	523	1,889
German Aerospace Centre	Germany	232	205	222	238	897
TU Dresden	Germany	75	78	78	26	257
Max Planck Society	Germany	82	60	60	53	255
Karlsruhe Institute of Technology	Germany	58	59	51	16	184
National Institute of Advanced Industrial Science and Technology	Japan	801	664	677	628	2,770
University of Tokyo	Japan	379	364	327	408	1,478
Tohoku University	Japan	365	337	324	300	1,326
Osaka University	Japan	243	226	272	256	997
Kyoto University	Japan	212	210	224	235	881
Korea Electronics Telecomm	South Korea	1,752	1,996	2,694	2,558	9,000
Korea Advanced Institute of Science & Technology	South Korea	1,015	1,006	1,101	856	3,978
SNU R&DB Foundation	South Korea	621	550	609	599	2,379
Yonsei University	South Korea	535	552	577	611	2,275
Korea University Research and Business Foundation	South Korea	494	518	509	473	1,994
The United States Navy	US	231	204	92	65	592
North-western University	US	73	103	91	167	434
The United States Army	US	165	126	61	64	416
Massachusetts Institute of Technology	US	88	76	56	33	253
Wisconsin Alumni Research Foundation	US	40	52	54	98	244

Source: Compiled using the WIPO Statistics, Data Centre (March 2017).

made 434 patent applications. The number of patent applications made by the Zheijang University (2,780) in 2013 alone was almost 8 times more than the total number of patent applications made by Turkish universities (372) in 2015 and approximately 3 times more than the total number of patent applications made by Turkish universities (974) in 2016. As these numbers suggest, universities in Turkey have a low number of patent applications.

Table G.4.10 shows the Entrepreneurial and Innovative University Index Rankings conducted by TÜBİTAK. Universities are assessed according to five criteria: expertise in scientific and technological research, intellectual property repository, cooperation and interaction, culture of entrepreneurship and innovation, and economic contribution and commercialization. **This ranking should not be perceived as a general university or education/research ranking. It aims to create awareness, in the case of the aforementioned five criterias, and encourage more entrepreneurship and innovation.** According to the 2016 ranking, Sabancı University ranked first. Meanwhile, METU ranked second, İ.D. Bilkent University third, İTÜ fourth and Boğaziçi University ranked fifth. It can be seen that the top five universities had similar rankings in the previous years.

Table G.4.10 The Entrepreneurial and Innovative University Index Rankings (2016)

Rank	University	Total	Expertise in scientific and technological research	Intellectual property repository	Cooperation and interaction	Culture of entrepreneurship and innovation	Economic contribution and commercialization	Rank (2015)	Rank (2014)	Rank (2013)	Rank (2012)
1	Sabancı	95.03	20.0	13.1	25.0	12.5	24.4	1	2	2	1
2	METU	85.80	20.0	10.5	22.6	13.9	18.8	2	1	1	2
3	İ.D. Bilkent	82.63	19.4	10.1	24.0	10.5	18.5	4	4	3	3
4	İTÜ	80.41	16.5	9.3	22.5	13.6	18.6	6	7	5	5
5	Boğaziçi	80.11	18.0	10.2	24.1	11.1	16.7	3	3	4	6
6	Koç	78.61	18.0	10.0	24.9	9.7	16.0	5	5	8	8
7	Gebze Technical	77.82	19.4	8.0	16.5	10.1	23.7	11	12	13	9
8	Özyeğin	75.31	16.4	7.5	20.8	12.3	18.3	7	6	7	4
9	İzmir Institute of Technology	68.65	19.4	7.7	22.6	7.6	11.3	8	9	6	7
10	Yıldız Technical	67.64	12.3	11.1	18.5	11.6	14.1	10	11	15	19
11	TOBB ETÜ	63.79	16.4	13.8	18.3	3.7	11.5	9	8	9	10
12	Selçuk	58.73	11.0	11.6	14.4	13.7	8.0	12	10	11	16
13	Ege	55.19	12.5	4.5	16.4	15.0	6.8	15	15	14	12
14	Erciyes	52.86	11.2	3.8	13.6	12.5	11.8	13	21	21	13
15	İstanbul Şehir	52.63	10.6	4.4	18.1	7.9	11.6		36	50	
16	Gaziantep	51.64	10.0	6.9	12.2	12.7	9.9	24	25	28	28
17	Hacettepe	51.57	12.8	7.6	14.4	9.1	7.7	14	14	10	11
18	Çankaya	50.78	9.8	10.1	10.5	8.0	12.5	20	22	19	17
19	Atılım	50.58	12.3	4.8	14.4	7.8	11.3	26	17	20	26
20	Anadolu	50.41	7.8	5.9	14.0	12.1	10.6	16	13	16	37
21	Gazi	50.33	12.1	5.2	11.1	13.1	8.8	18	16	12	15
22	Ankara	46.63	12.1	1.7	13.2	13.0	6.6	32	29	26	23
23	Abdullah Gül	46.28	12.2	5.6	14.8	1.2	12.5	17			
24	Uludağ	45.26	8.6	8.6	14.5	9.1	4.4	19	19	29	25
25	Sakarya	43.78	7.9	6.0	10.0	8.8	11.1	21	45		38
26	Dokuz Eylül	43.48	9.6	1.9	12.6	12.5	6.9	23	33	32	27
27	Yeditepe	43.38	9.6	9.5	16.1	4.0	4.3	25	26	18	21
28	Çukurova	42.87	10.6	2.0	12.9	7.1	10.2	22	18	17	20
29	İzmir University of Economics	42.74	9.0	6.3	16.2	5.7	5.5	39	28	35	34
30	İstanbul	42.53	9.6	4.6	9.1	13.8	5.5	31	32	36	35
31	Akdeniz	42.11	9.2	3.5	13.6	11.9	3.9	30	34	25	22
32	Mersin	42.05	10.5	2.9	6.4	11.9	10.3	44	31	27	29
33	Kocaeli	41.81	7.5	2.2	10.8	8.3	13.0	27	24	23	24
34	Pamukkale	40.93	8.1	3.5	10.9	10.4	8.0	42	48	42	40
35	Süleyman Demirel	39.20	11.1	4.7	10.4	4.2	8.8	28	20	22	14
36	Bahçeşehir	38.81	6.8	2.7	12.9	8.1	8.3	36	27	24	18
37	Fırat	38.25	10.5	1.9	8.7	12.1	5.0	45	46	34	39
38	KTÜ	37.98	9.5	3.5	10.5	7.8	6.8	35	38	30	31
39	Yaşar	34.90	9.1	5.7	13.9	6.3	0.0				
40	Marmara	34.87	8.2	3.1	11.2	8.1	4.3	43			47
41	Bursa Technical	33.90	12.4	7.7	13.4	0.4	0.0				
42	Gaziosmanpaşa	33.34	10.1	3.6	10.5	4.5	4.7	46		47	
43	Okan	32.46	4.7	9.7	4.9	7.2	5.9	40	35	41	46
44	İstanbul Bilgi	32.21	5.5	2.4	15.1	5.0	4.2				
45	Kadir Has	31.42	7.1	2.2	17.0	5.1	0.0	37	47	45	30
46	Dumlupınar	31.17	9.7	2.1	5.7	2.9	10.8				
47	University of Turkish Aeronautical Association	31.12	5.1	0.0	8.5	0.0	17.5				
48	Atatürk	30.98	11.5	0.6	5.4	10.8	2.7	50	43	37	33
49	Başkent	30.78	6.2	3.2	5.5	5.9	9.9			48	
50	Eskişehir Osmangazi	30.48	8.8	2.7	6.8	5.4	6.8	49	42	49	

Source: Compiled using TÜBİTAK Entrepreneurial and Innovative University Index Rankings data.

CHAPTER G

HIGHLIGHTS

When Turkey-based publications on international databases like Scopus and Web of Science are analysed, it can be seen that the number of Turkey-based scientific publications have been increasing over the years, while the number of citations lagged behind, causing a decline in the number of citations per publication (**Indicator G1**). This indicates that there are issues with the quality of scientific publications. Considering that Turkey's number of international scientific publications reached approximately 40,000, it is important to increase incentives for these publications. Moreover, considering world publication rankings, Turkey has been ranking between 18-20 in the last several years, unable to progress further. **Aiming to become a top 10 economy, thus establishing an economy based on advanced technology and knowledge, Turkey has to investigate why the number of publications is not increasing adequately.**

The number of academic projects proposed to TÜBİTAK ARDEB has been increasing in the last few years; however, the number of projects supported is increasing at a slower rate than the number proposed. While 46% of the proposed projects were approved in 2002, this rate declined to 18% in 2015. In other words, **TÜBİTAK only deemed one out of every five projects worthy of support.**

Both in world and regional university rankings, it can be seen that the top universities have higher rates of international researchers and students than universities in Turkey as well as a lower number of students per academic staff. Moreover, with the exception of the University of California, Berkeley, the top-ranking universities usually have less than 20,000 students. **Considering that rankings rely heavily on the number of scientific publications, it is definite that these top-ranking universities attract prominent researchers with numerous publications.**

RECOMMENDATIONS

- Considering that the number of scientific publications and R&D capacity relies on well-educated human resources, Turkey has to take precautions aiming to increase and improve human resources. In this respect, **immediate precautions should be taken especially to improve doctorate graduate resources (Chapter C)**. Similarly, special support programs regarding academic personnel employment must be developed for smaller universities, as universities with higher numbers of academic personnel have an increased research capacity and various advantages in university rankings.
- In academic promotions and appointment processes, along with the number of publications and patents, additional criteria such as the number of citations and licensed products with patents should also be regarded.
- Considering that TÜBİTAK only deems one out of every five R&D projects worthy of support, universities and TÜBİTAK should continue to provide lectures and seminars on how to prepare proper projects. Moreover, a platform that would bring academics experienced in project application and management together with those who are less experienced should be established.
- In order to improve the quality and international reputation of universities in Turkey, **special measures aiming to attract international researchers and students to Turkish universities should be taken.** In this respect, as part of good governance in universities, administrative principles should be set together with students and academics. Moreover, academic freedoms must be extended, research infrastructure improved and more financially attractive conditions must be created for researchers and students.
- To truly improve universities' relations with industries as well as society, higher education administrators and top-level management both at the institutional and governmental level should be made accountable (Gür, 2016).

CHAPTER G

REFERENCES

CABİM. (2017). Türkiye bilimsel yayın performans raporları. http://cabim.ulakbim.gov.tr/bibliyometrik-analiz/turkiye-bilimsel-yayin-performans-raporlari/

Çetinsaya, G. (2014). *Büyüme, kalite, uluslararasılaşma: Türkiye yükseköğretimi için bir yol haritası* [Growth, quality, internationalization: A roadmap for Turkish higher education]. Eskişehir: Yükseköğretim Kurulu.

Gür, B. S. (2016). *Egemen üniversite: Amerika'da yükseköğretim sistemi ve Türkiye için reform önerileri* [The dominant university: Higher education system in the US and reform suggestions for Turkey]. İstanbul: EDAM.

ODTÜ Enformatik Enstitüsü URAP Laboratuvarı. (2017). *Üniversitelerimizin 2016 yılı dünya genel sıralamalarındaki durumu* [State of Turkish Universities in 2016 General World Rankings]. Ankara: ODTÜ Enformatik Enstitüsü.

TURKSTAT. (2016). *Araştırma-geliştirme faaliyetleri araştırması* (Haber Bülteni No. 21782) [Research & Development Activity Report (Bulletin No.21782)]. Ankara: Türkiye İstatistik Kurumu. http://www.tuik.gov.tr/PreHaberBultenleri.do?id=21782

TURKSTAT. (2017). *Uluslararası Standart Kitap Numarası (ISBN) istatistikleri*, 2016 (No. 24674) [International Standard Book Number (ISBN) statistics, 2016 (No.24674)]. Türkiye İstatistik Kurumu. http://www.tuik.gov.tr/PreHaberBultenleri.do?id=24674

TURKPATENT. (2017). Türk Patent ve Marka Kurumu. http://www.turkpatent.gov.tr

ULAKBİM. (2015). *2015 faaliyet raporu* [2015 activity report]. Ankara: TÜBİTAK.

The Outlook on Higher Education in Turkey

Monitoring and Evaluation Report

2017

Educators Trade Union General Center

Oğuzlar Neighbourhood Av. Özdemir Özok Street No: 5 Balgat-Ankara/TURKEY

Phone: +90 312 231 23 06 / Gsm: +90 533 741 40 26 / Fax: +90 312 230 65 28

www.ebs.org.tr facebook.com/egitimbirsen twitter.com/egitimbirsen