A Summary of Selected Innovation-Related Indicators for Turkey

Yeditepe University Economics Notes Series

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1 Introduction

The recent earthquake scare in Istanbul has once again highlighted the commonly neglected issue of vast spatial economic imbalances in Turkey. As of 2017 about 31% of the economic activity and 18% of the population was concentrated in only one location, Istanbul (Turkish Statistical Institute, 2019). This report focuses on one dimension of economic activity, the R&D and Innovation-related sectors, as major drivers of regional economic growth, and hence, powerful causes and consequences of spatial agglomeration and concentration.

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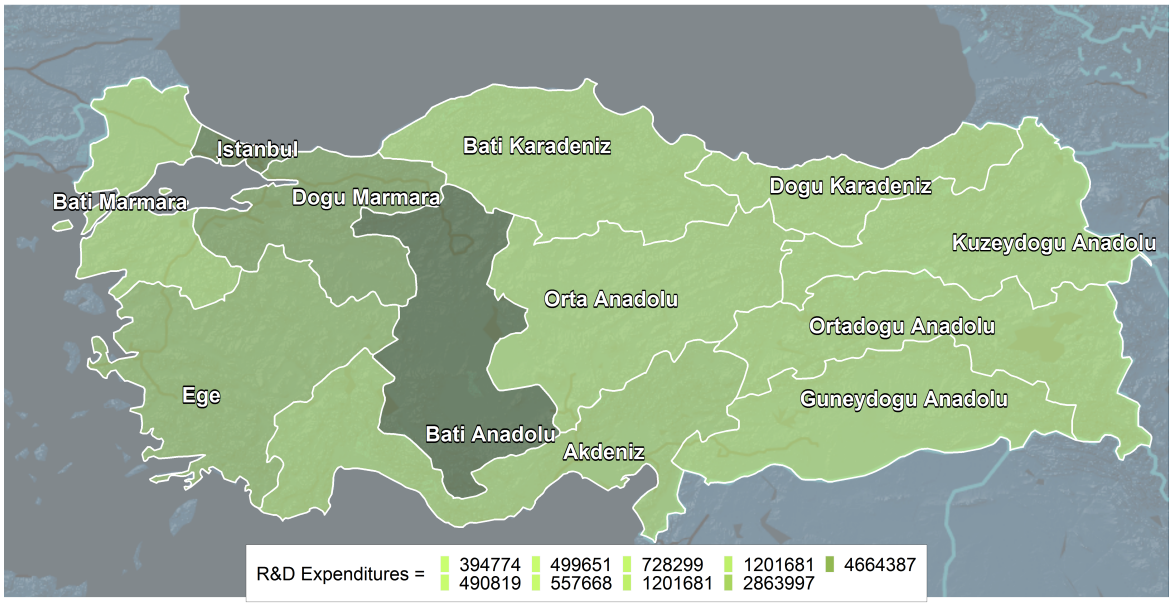
This descriptive report summarizes the set of variables presented in Table 1 for the statistical regions of Turkey. Data availability issues for specific regional scales such as province level (NUTS 3), together with missing data for certain years require the summary of these variables to be made for different spatial scales and time periods. The data are obtained from Turkish Statistical Institute, OECD Stat, and Euro Stat, and visualized for the reader using the R packages ggmap and ggplot. The time trends, together with regional patterns are summarized for each indicator through key observations listed under each figure.

Table 1.
Summarized Indicators

Indicator	Territorial Level	Source
R&D Expenditures	NUTS 1 (12 Regions)	Turkstat
Employment in R&D		
Employment in Information and Communication		Eurostat
Employment in High-Technology Sectors		
Employment in Professional, Scientific, and Technical Activities		
Employment in Knowledge-Intensive Services		
Employment in High Technology Manufacturing	NUTS 2 (26 Regions)	OECD Stat
Tertiary Labor Force		
Employment in Knowledge-Intensive Services		
Patent Applications		
Co-patent Applications		

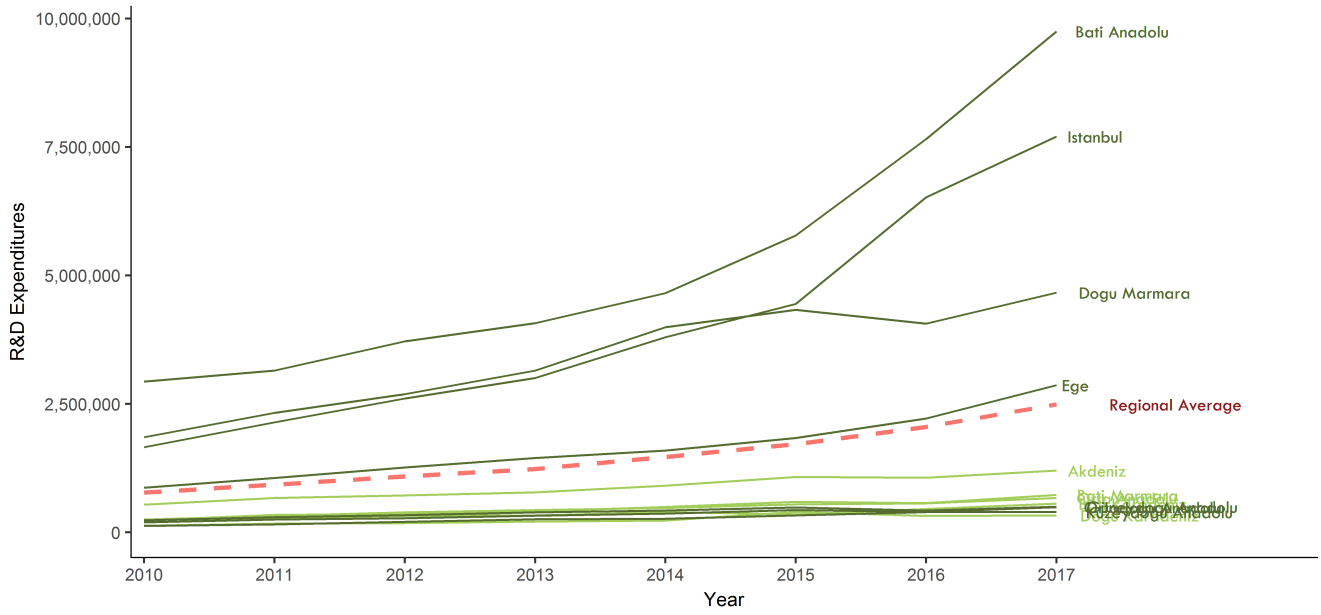
2 Descriptive Summary of Selected Variables

Figure 1.
R&D Expenditure by Region (2017), current TL



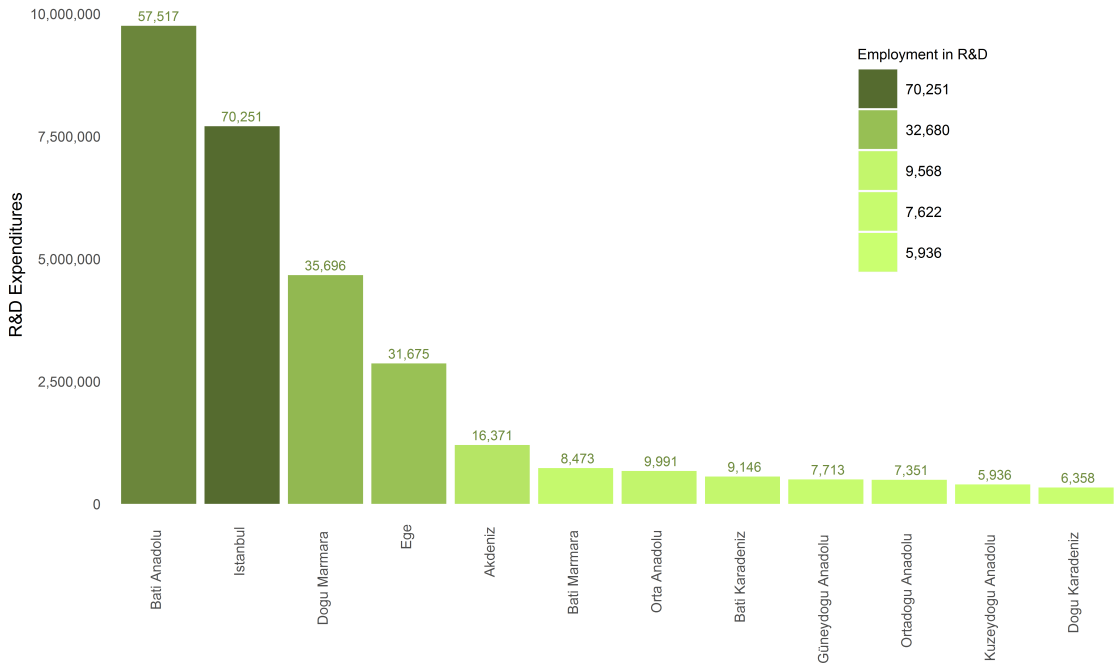
- In 2017, the region with the highest value of R&D Expenditures was Bati Anadolu with 9,751,434 Turkish Liras.
- Bati Anadolu was followed by Istanbul and Dogu Marmara with values of 7,701,448 and 4,664,387 Turkish Liras respectively.
- The average value of R&D Expenditures across regions was 2,487,956.3 Turkish Liras.
- The region with R&D Expenditures closest to the average is Ege with 2,863,997 Turkish Liras.
- The region with the lowest value of R&D Expenditures was Dogu Karadeniz with 332,608 Turkish Liras.
- The total amount of R&D Expenditures was 29,855,476 Turkish Liras.
- The region with the highest value of R&D Expenditures (Bati Anadolu) had around 33 percent of the all R&D Expenditures in 2017.
- The region with the lowest value of R&D Expenditures (Dogu Karadeniz) had around 1 percent of the all R&D Expenditures in 2017.
- With a coefficient of variation of 129%, the R&D Expenditures indicator pose a mediocre level of variation relative to the other variables covered in this report.

Figure 2.
R&D Expenditure by Region (2010 – 2017), current TL



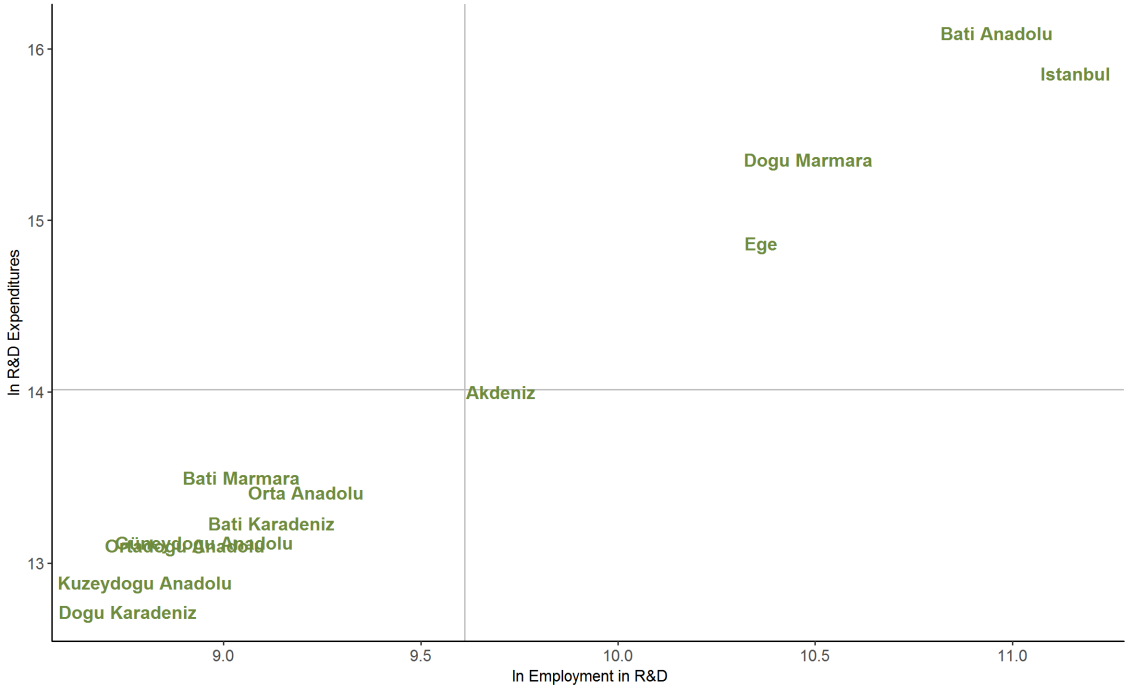
- The average regional change in R&D Expenditures has been 222.1 percent between 2010 and 2017.
- The region that experienced the highest absolute change in R&D Expenditures is Bati Anadolu with 6,817,883 Turkish Liras.
- The region that experienced the lowest absolute change in R&D Expenditures is Dogu Karadeniz with 199,777 Turkish Liras.
- The region that experienced the highest percentage change in R&D Expenditures is Istanbul with 364.7 percent.
- The region that experienced the lowest percentage change in R&D Expenditures is Güneydogu Anadolu with 113.9 percent.
- The region that experienced a percentage change that is closest to the regional average of R&D Expenditures was Ege with 229.1 percent.

Figure 3.
R&D Expenditure and Employment in R&D by Region (2017)



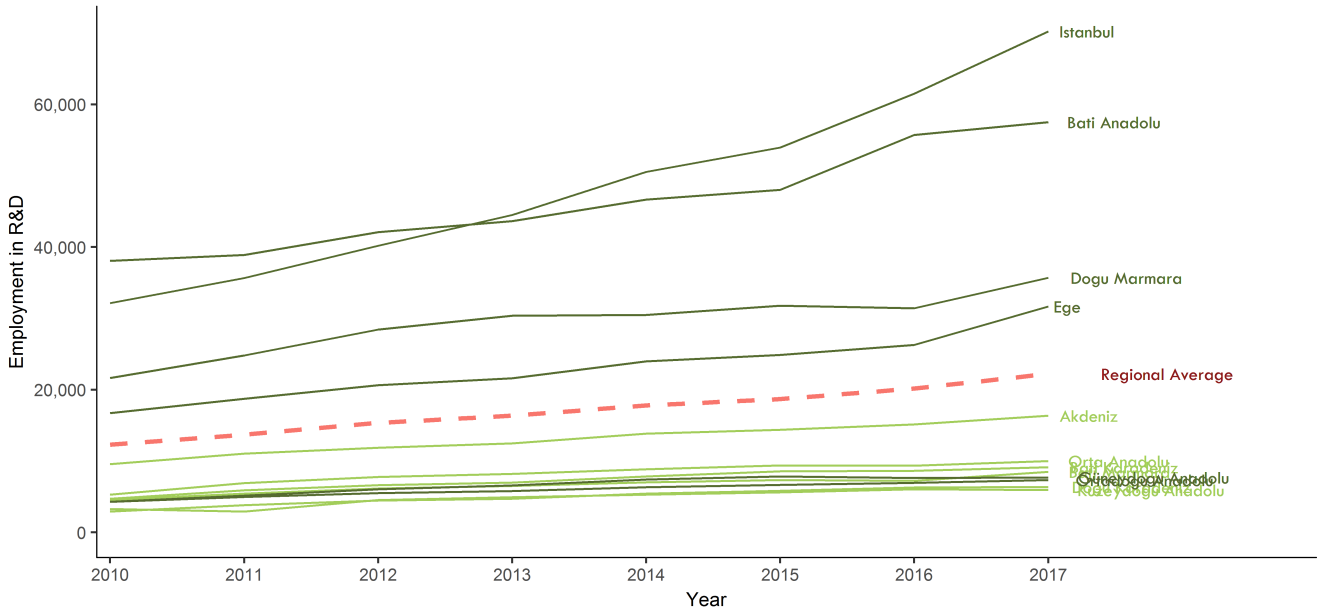
- Bars represent the levels of R&D Expenditures while darker colors indicate higher levels of Employment in R&D.
- In 2017, the region with the highest value of Employment in R&D was Istanbul with 70,251 People.
- Istanbul was followed by Bati Anadolu and Dogu Marmara with values of 57,517 and 35,696 people respectively.
- The region with the lowest value of Employment in R&D was Kuzeydogu Anadolu with 5,936 people.
- The average value of Employment in R&D across regions was 22,206.5 people.
- The region with Employment in R&D closest to the average is Akdeniz with 16,371 people.
- The total amount of Employment in R&D was 266,478.
- The region with the highest value of Employment in R&D (Istanbul) had around 26 percent of the all Employment in R&D in 2017.
- The region with the lowest value of Employment in R&D (Kuzeydogu Anadolu) had around 2 percent of the all Employment in R&D in 2017.
- The variation of Employment in R&D across regions is relatively low as implied by a coefficient of variation of 99 %.

Figure 4.
R&D Expenditure and Employment in R&D by Region (2017)



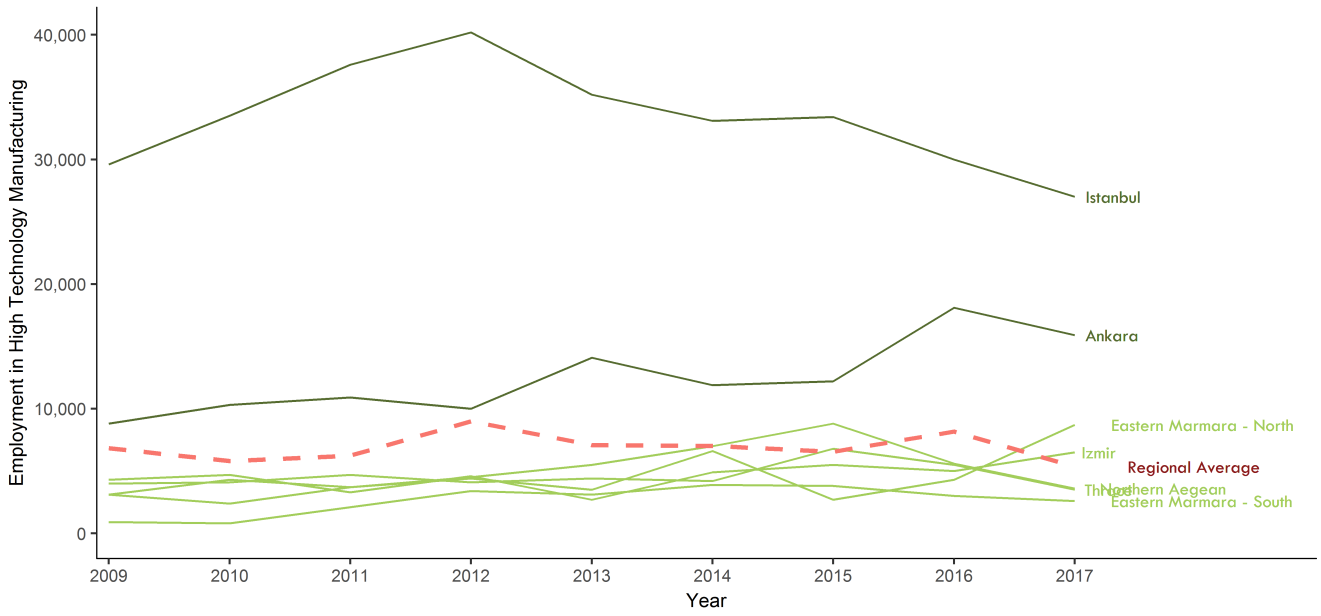
- R & D Expenditures and Employment in R&D are reported natural logarithms in the above scatterplot for the purpose of condensing the graph.
- While the actual values would result with observations extending too far out towards the upper-right-hand side due to large regional differences, this monotonic transformation is still useful to convey the order of regions in regards to R&D Expenditures and Employment in R&D.
- The vertical and horizontal lines represent the mean of ln Employment in R&D and ln R&D Expenditures respectively.
- The regions in Quadrant I are those with R&D Expenditures and Employment in R&D that are higher than regional averages (Bati Anadolu, Dogu Marmara, Ege, Istanbul. Akdeniz is in quadrant 3 - the associated data point is not plotted in the graph).
- The regions in Quadrant III are those with R D Expenditures and Employment in R&D that are lower than regional averages (Akdeniz, Bati Karadeniz, Bati Marmara, Dogu Karadeniz, Güneydogu Anadolu, Kuzeydogu Anadolu, Orta Anadolu, Ortadogu Anadolu).
- The regions in Quadrant II are those with higher-than-average values of R&D Expenditures and lower-than average values of Employment in R&D (There are no regions in this category for this variable).
- The regions in Quadrant IV are those with lower-than-average values of R&D Expenditures and higher-than average values of Employment in R&D (There are no regions in this category for this variable).

Figure 5.
R&D Employment by Region (2010 – 2017), number of people



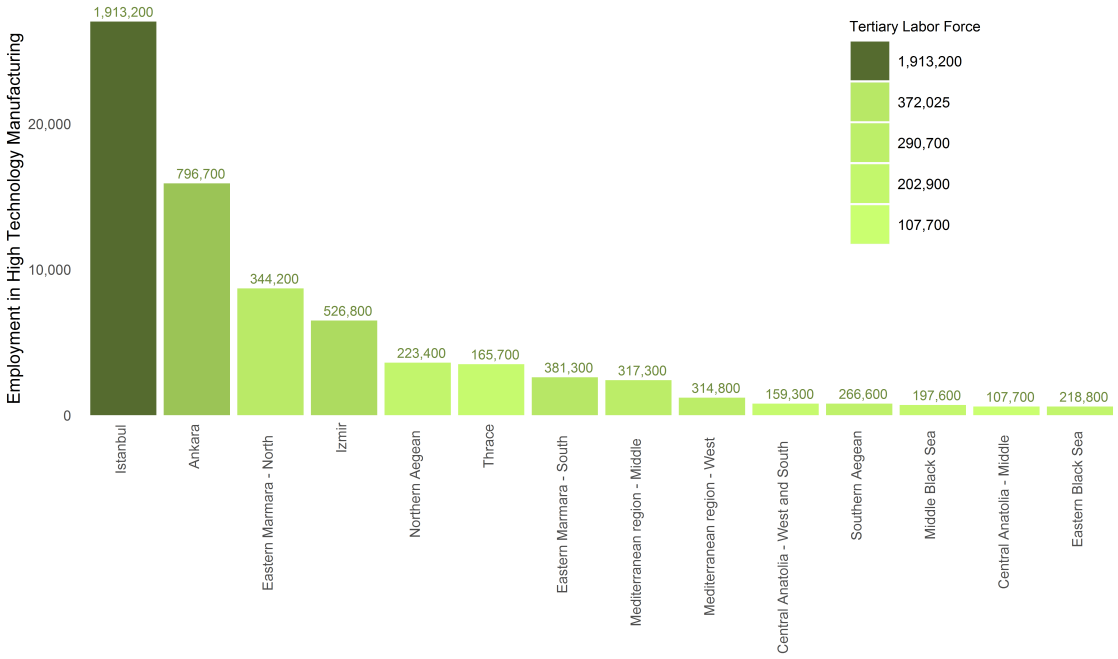
- The average regional change in Employment in R&D has been 80.8 percent between 2010 and 2017.
- The region that experienced the highest absolute change in Employment in R&D is Istanbul with 38,127 people.
- The region that experienced the lowest absolute change in Employment in R&D is Kuzeydogu Anadolu with 2,649 people.
- The region that experienced the highest percentage change in Employment in R&D is Istanbul with 118.7 percent.
- The region that experienced the lowest percentage change in Employment in R&D is Bati Anadolu with 51.1 percent.
- The region that experienced a percentage change that is closest to the regional average of Employment in R&D was Kuzeydogu Anadolu with 80.6 percent.

Figure 6.
Employment in High Technology Manufacturing by Region (2009 – 2017), number of people



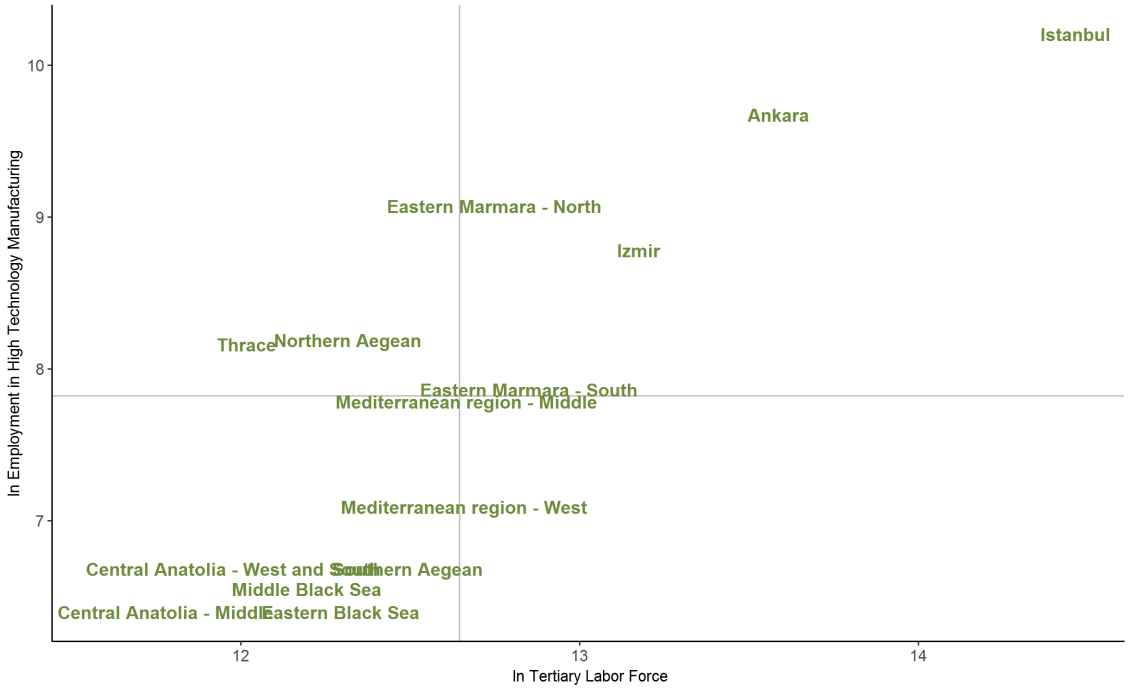
- The average regional change in Employment in high technology manufacturing has been -1.2 percent between 2009 and 2018 (the final year is not shown in the graph).
- The region that experienced the highest absolute change in Employment in high technology manufacturing is Ankara with 8,800 people.
- The region that experienced the lowest absolute change in Employment in high technology manufacturing is Izmir with a decline of 500 people.
- The region that experienced the highest percentage change in Employment in high technology manufacturing is Eastern Marmara - North with 225.8 percent.
- The region that experienced the lowest percentage change in Employment in high technology manufacturing is Izmir with a decline of 11.6 percent.

Figure 7.
Employment in High Technology Manufacturing by Region (2017), number of people



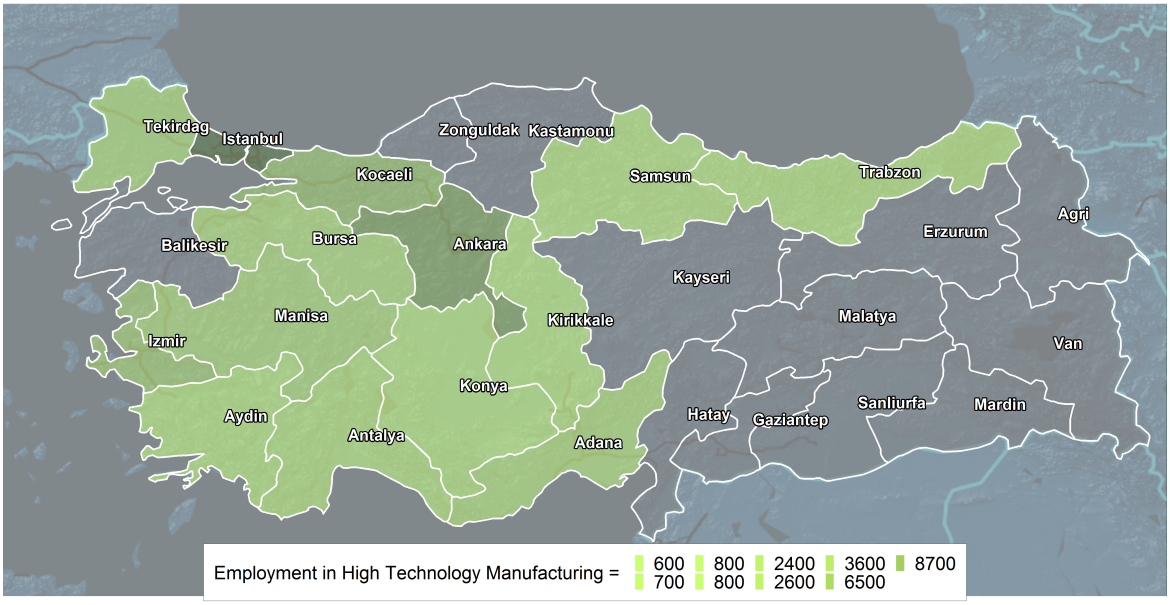
- Bars represent the levels of Employment in high technology manufacturing while darker colors indicate higher levels of Tertiary Labor Force.
- In 2017, the region with the highest value of Tertiary Labor Force was Istanbul with 1,913,200 people.
- Istanbul was followed by Ankara and Izmir with values of 796,700 and 526,800 people respectively.
- The region with the lowest value of Tertiary Labor Force was Central Anatolia - Middle with 107,700 people.
- The average value of Tertiary Labor Force across regions was 423,814.3 people.
- The region with Tertiary Labor Force closest to the average is Eastern Marmara - South with 381,300 people.
- The total amount of Tertiary Labor Force was 5,933,400.
- The region with the highest value of Tertiary Labor Force (Istanbul) had around 32 percent of the all Tertiary Labor Force in 2017.
- The region with the lowest value of Tertiary Labor Force (Central Anatolia - Middle) had around 2 percent of the all Tertiary Labor Force in 2017.
- The variation of Tertiary Labor Force across regions is mediocre (relative to the other indicators presented in this report) as implied by a coefficient of variation of 109 %.

Figure 8.
Employment in High Technology Manufacturing and Tertiary Labor Force by Region
(2017)



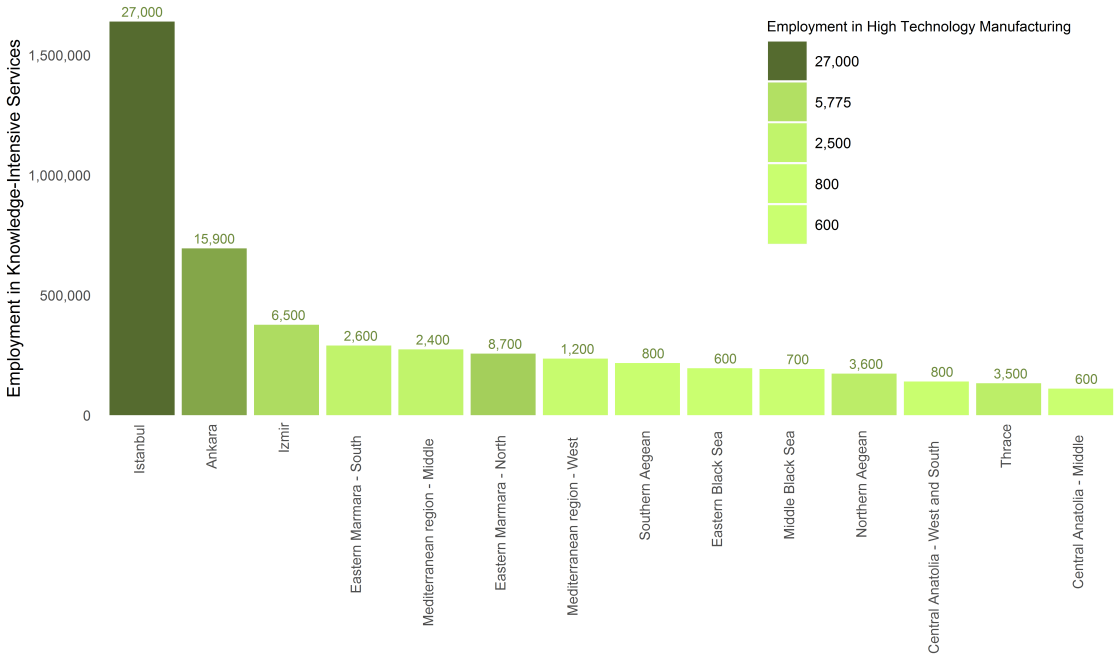
- Employment in high technology manufacturing and Tertiary Labor Force are reported natural logarithms in the above scatterplot for the purpose of condensing the graph.
- The vertical and horizontal lines represent the mean of ln Tertiary Labor Force and ln Employment in high technology manufacturing respectively.
- The regions in Quadrant I are those with Employment in high technology manufacturing and Tertiary Labor Force that are higher than regional averages (Ankara, Istanbul, Izmir).
- The regions in Quadrant III are those with Employment in high technology manufacturing and Tertiary Labor Force that are lower than regional averages (Central Anatolia - Middle, Central Anatolia - West and South, Eastern Black Sea, Eastern Marmara - South, Mediterranean region - Middle, Mediterranean region - West, Middle Black Sea, Southern Aegean, Thrace).
- The regions in Quadrant II are those with higher-than-average values of Employment in high technology manufacturing and lower-than average values of Tertiary Labor Force (Northern Aegean, Thrace, Eastern Marmara - North).

Figure 9.
Employment in High Technology Manufacturing by Region (2017)



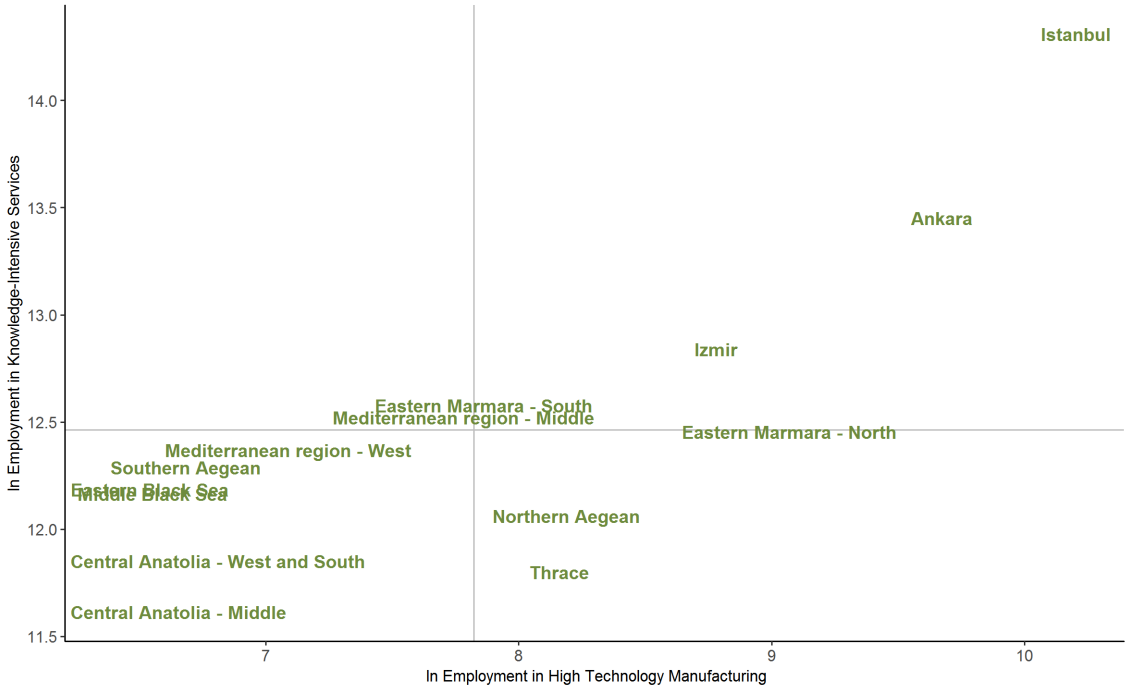
- In 2017, the region with the highest value of Employment in high technology manufacturing was Istanbul with 27,000 people. Regions that are not colored are those with missing data for this year.
- Istanbul was followed by Ankara and Eastern Marmara - North with values of 15,900 and 8,700 people respectively.
- The region with the lowest value of Employment in high technology manufacturing was Central Anatolia - Middle, and Eastern Black Sea with 600 people.
- The average value of Employment in high technology manufacturing across regions was 5,350 people.
- The region with Employment in high technology manufacturing closest to the average is Izmir with 6,500 people.
- The total amount of Employment in high technology manufacturing was 74,900 people.
- The region with the highest value of Employment in high technology manufacturing (Istanbul) had around 36 percent of the all Employment in high technology manufacturing in 2017.
- The regions with the lowest values of Employment in high technology manufacturing (Central Anatolia - Middle, and Eastern Black Sea) had around 1 percent of the all Employment in high technology manufacturing in 2017.
- The variation of Employment in high technology manufacturing across regions is high as implied by a coefficient of variation of 141 %.

Figure 10.
Employment in Knowledge-Intensive Services by Region (2018), number of people



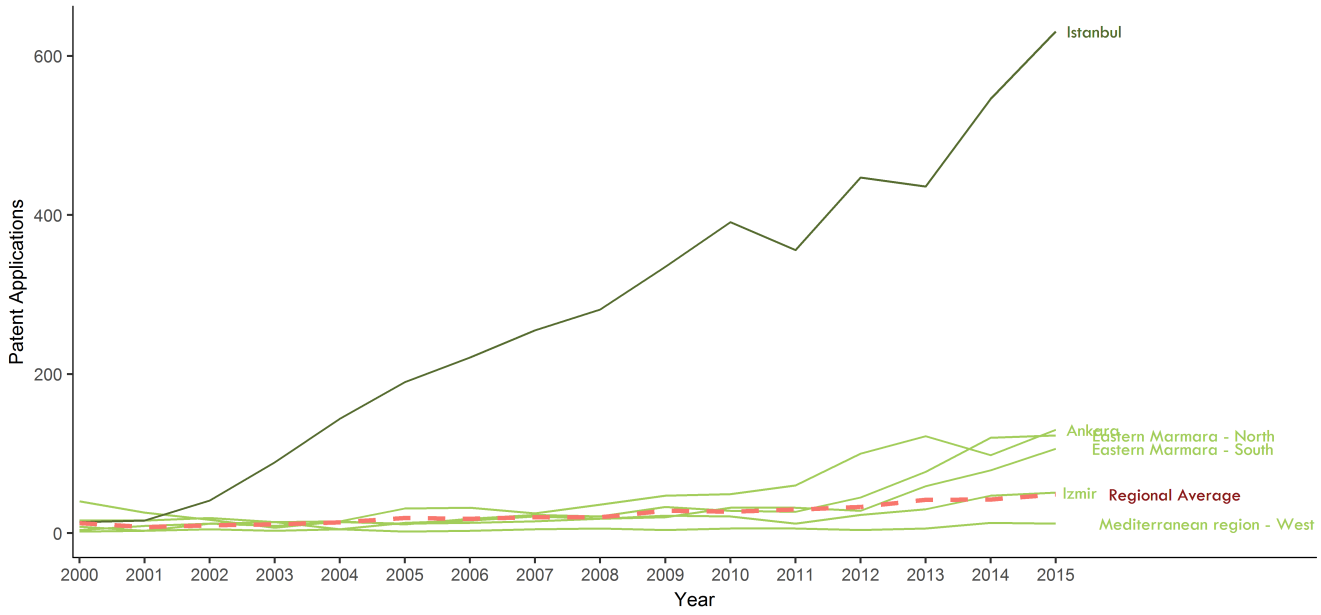
- Bars represent the levels of Employment in knowledge-intensive services while darker colors indicate higher levels of Employment in high-technology manufacturing.
- In 2017, the region with the highest value of Employment in high-technology manufacturing was Istanbul with 27,000 people.
- Istanbul was followed by Ankara and Eastern Marmara - North with values of 15,900 and 8,700 people respectively.
- The region with the lowest value of Employment in high-technology manufacturing was Central Anatolia - Middle, Eastern Black Sea with 600 people.
- The average value of Employment in high-technology manufacturing across regions was 5,350 people.
- The region with Employment in high-technology manufacturing closest to the average is Izmir with 6,500 people.
- The total amount of Employment in high-technology manufacturing was 74,900.
- The region with the highest value of Employment in high-technology manufacturing (Istanbul) had around 36 percent of the all Employment in high-technology manufacturing in 2017.
- The region with the lowest value of Employment in high-technology manufacturing (Central Anatolia - Middle, Eastern Black Sea) had around 1 percent of the all Employment in high-technology manufacturing in 2017.
- The variation of Employment in high-technology manufacturing across regions is mediocre relative to the other indicators as shown by a coefficient of variation of 141 %.

Figure 11.
Employment in Knowledge-Intensive Services and High Technology Manufacturing by Region (2018)



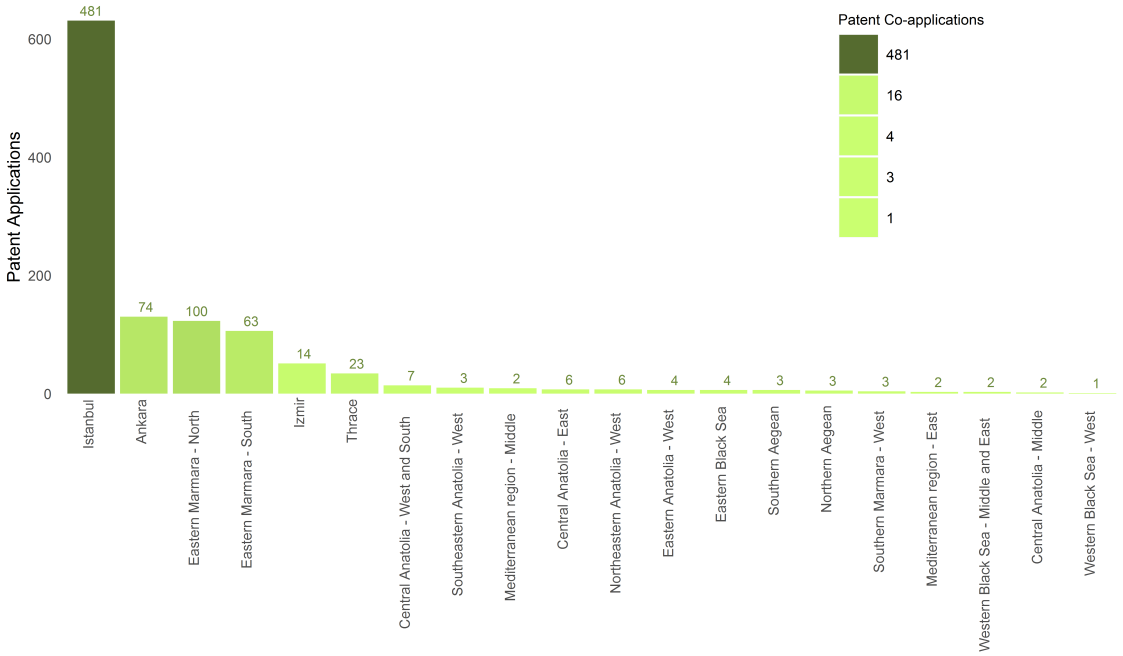
- Employment in knowledge-intensive services and Employment in high-technology manufacturing are reported natural logarithms in the above scatterplot for the purpose of condensing the graph.
- The vertical and horizontal lines represent the mean of ln Employment in high-technology manufacturing and ln Employment in knowledge-intensive services respectively.
- The regions in Quadrant I are those with Employment in knowledge-intensive services and Employment in high-technology manufacturing that are higher than regional averages (Ankara, Eastern Marmara - North, Istanbul, and Izmir).
- The regions in Quadrant III are those with Employment in knowledge-intensive services and Employment in high-technology manufacturing that are lower than regional averages (Central Anatolia - Middle, Central Anatolia - West and South, Eastern Black Sea, Mediterranean region - West, Middle Black Sea, and Southern Aegean).
- The regions in Quadrant II are those with higher-than-average values of Employment in knowledge-intensive services and lower-than average values of Employment in high-technology manufacturing (Eastern Marmara - South, Mediterranean region - Middle).
- The regions in Quadrant IV are those with lower-than-average values of Employment in knowledge-intensive services and higher-than average values of Employment in high-technology manufacturing (Northern Aegean and Thrace).

Figure 12.
Patent Applications by Region (2000 – 2015), fractional count



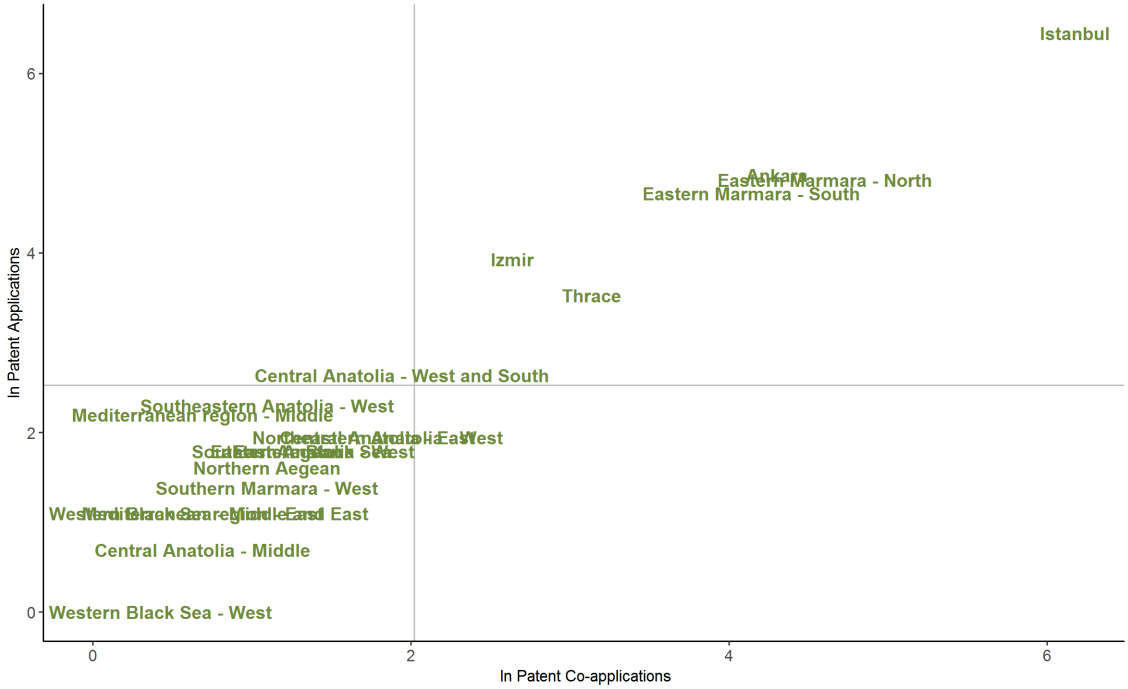
- The average regional change in Patent applications has been 79.4 percent between 2010 and 2015.

Figure 13.
Patent Applications by Region (2015), fractional count



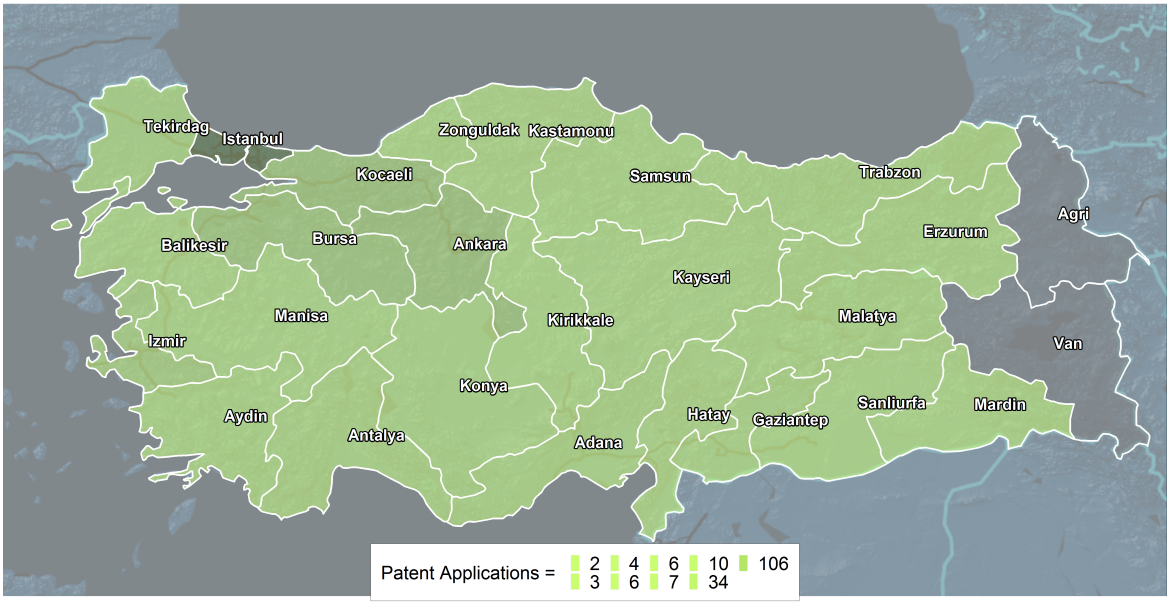
- Bars represent the levels of Patent applications while darker colors indicate higher levels of Co-patent applications.
- In 2015, the region with the highest value of Co-patent applications was Istanbul with 481 applications.
- Istanbul was followed by Eastern Marmara - North and Ankara with values of 100 and 74 applications respectively.
- The region with the lowest value of Co-patent applications was Western Black Sea - West with 1 applications.
- The average value of Co-patent applications across regions was 40.1 applications.
- The region with Co-patent applications closest to the average is Thrace with 23 applications.
- The total amount of Co-patent applications was 803.
- The region with the highest value of Co-patent applications (Istanbul) had around 60 percent of the all Co-patent applications in 2015.
- The region with the lowest value of Co-patent applications (Western Black Sea - West) had less than one percent of the all Co-patent applications in 2015.

Figure 14.
Patent Applications and Patent Co-applications by Region (2015), fractional count



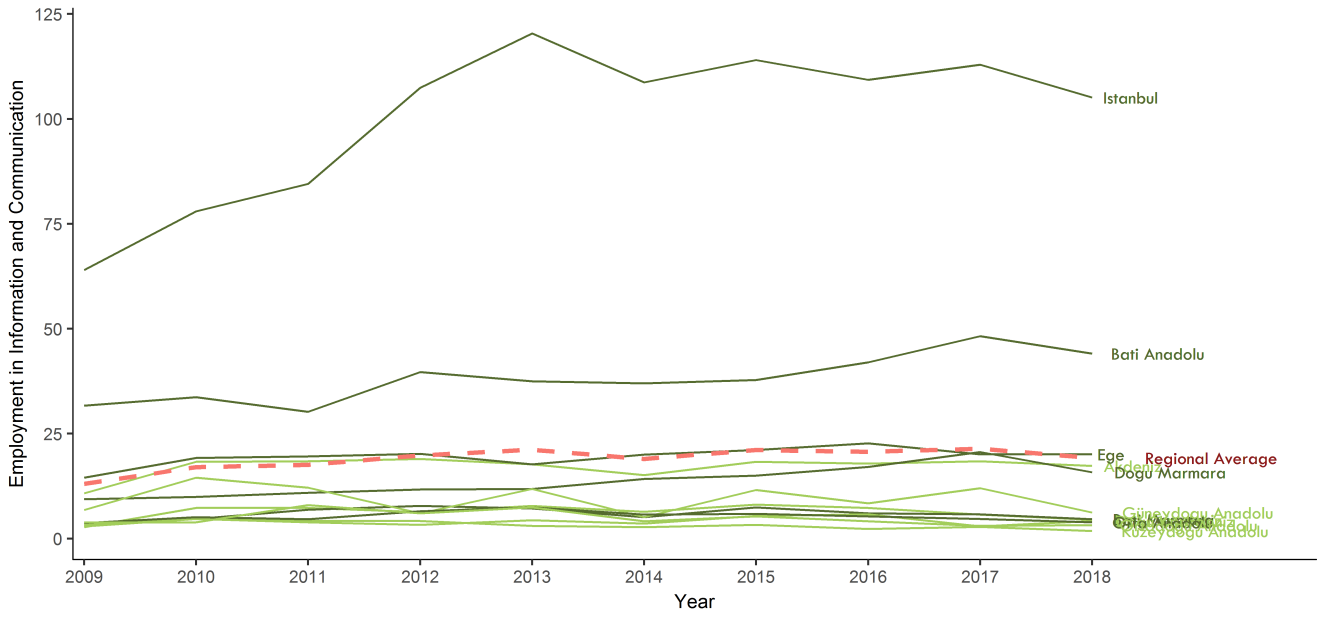
- Patent applications and Co-patent applications are reported natural logarithms in the above scatterplot for the purpose of condensing the graph.
- The vertical and horizontal lines represent the mean of ln Co-patent applications and ln Patent applications respectively.
- The regions in Quadrant I are those with Patent applications and Co-patent applications that are higher than regional averages (Ankara, Eastern Marmara - North, Eastern Marmara - South, Istanbul, Izmir, and Thrace).
- The regions in Quadrant III are those with Patent applications and Co-patent applications that are lower than regional averages (Central Anatolia - East, Central Anatolia - Middle, Central Anatolia - West and South, Eastern Anatolia - West, Eastern Black Sea, Mediterranean region - East, Mediterranean region - Middle, Northeastern Anatolia - West, Northern Aegean, Southeastern Anatolia - West, Southern Aegean, Southern Marmara - West, Western Black Sea - Middle and East, and Western Black Sea - West).

Figure 15.
Patent Applications by Region (2015)



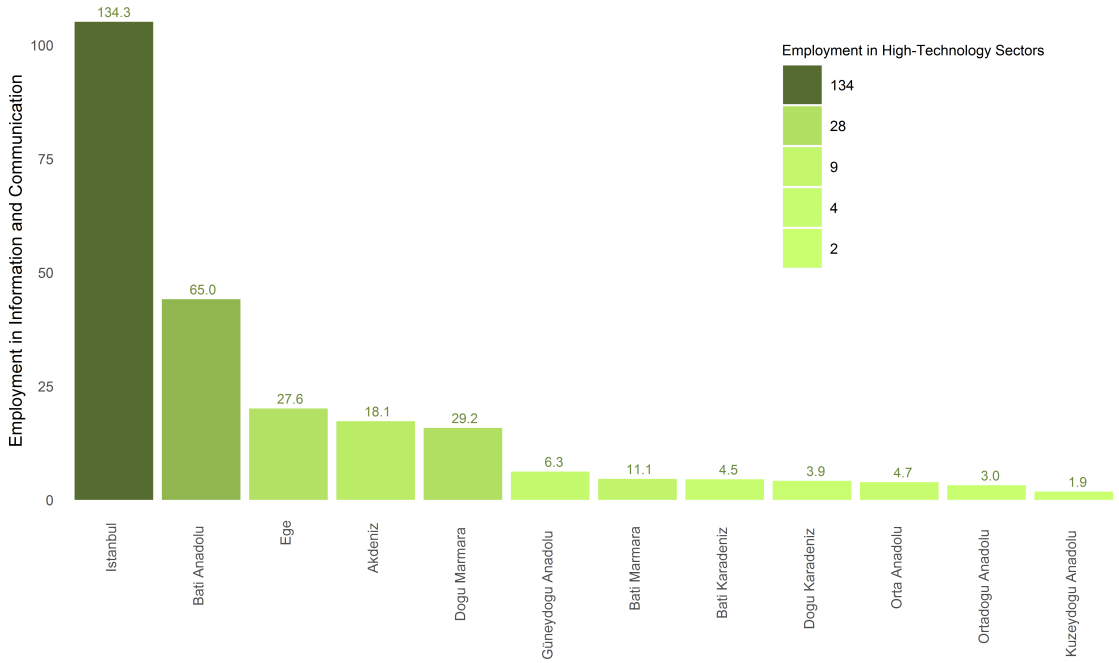
- In 2015, the region with the highest value of Patent applications was Istanbul with 631 applications. The regions without color are those with missing data for this year.
- Istanbul was followed by Ankara and Eastern Marmara - North with values of 130 and 123 applications respectively.
- The region with the lowest value of Patent applications was Southeastern Anatolia - East, Southeastern Anatolia - Middle, Western Black Sea - West with only 1 application.
- The average value of Patent applications across regions was 48.9 applications.
- The region with Patent applications closest to the average is Izmir with 51 applications.
- The total amount of Patent applications was 1,174 applications.
- The region with the highest value of Patent applications (Istanbul) had around 54 percent of the all Patent applications in 2015.
- The region with the lowest value of Patent applications (Southeastern Anatolia - East, Southeastern Anatolia - Middle, Western Black Sea - West) had around 0 percent of the all Patent applications in 2015.
- This indicator has the highest coefficient of variation among those covered in this report (266 %), implying that the regional differences are particularly vast regarding this innovation indicator.

Figure 16.
Employment in Information and Communication (2009 – 2018), Thousands of people



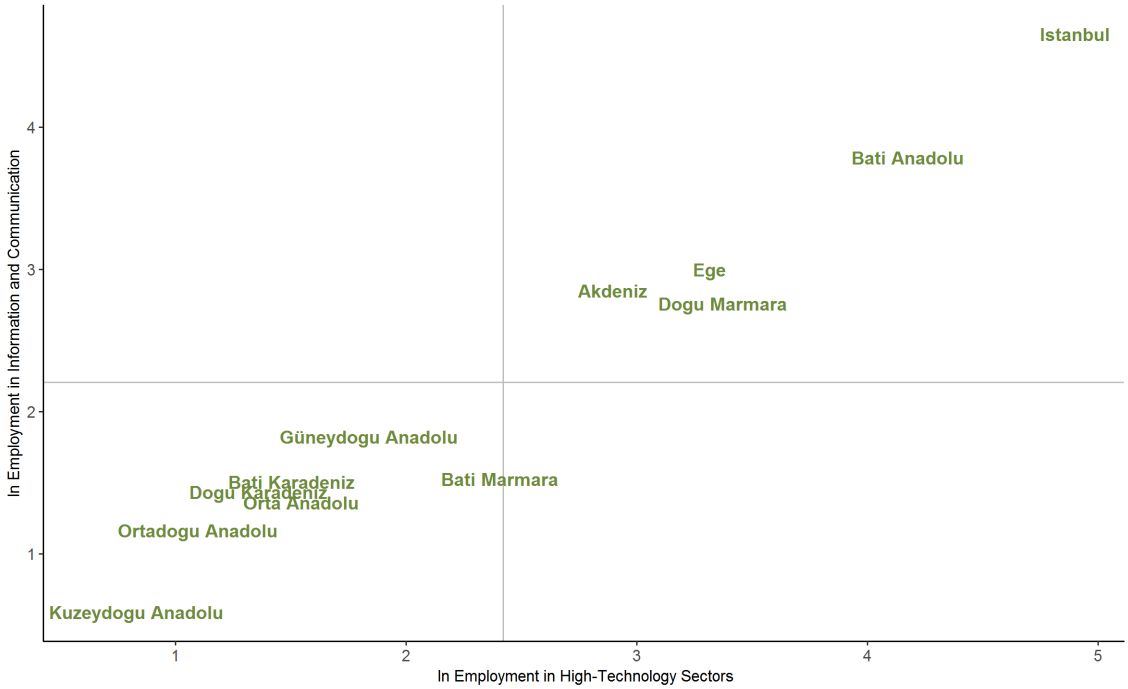
- The region that experienced the highest percentage change in Employment in Information and Communication is Dogu Marmara with 68.1 percent.
- The region that experienced the highest absolute change in Employment in Information and Communication is Istanbul with 41.1 thousand people.
- The region that experienced the lowest absolute change in Employment in Information and Communication is Kuzeydogu Anadolu with a decline of 1.6 thousand people.
- The region that experienced the lowest percentage change in Employment in Information and Communication is Kuzeydogu Anadolu with a decline of 47.1 percent.
- The region that experienced a percentage change that is closest to the regional average of Employment in Information and Communication was Dogu Karadeniz with 44.8 percent.

Figure 17.
Employment in Information and Communication (2018), Thousands of People



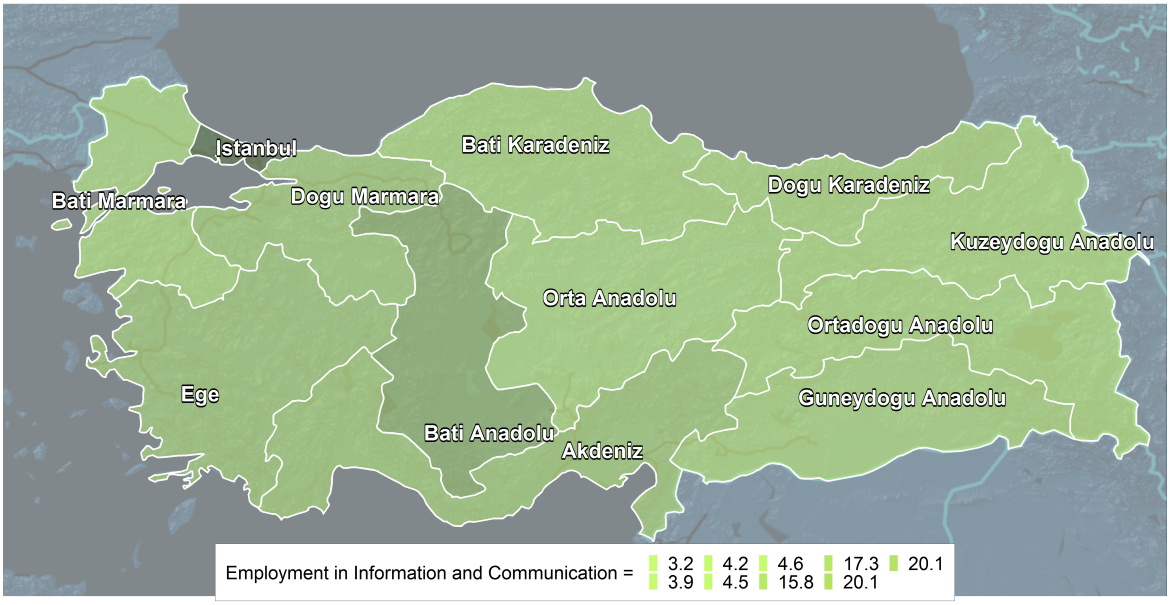
- Bars represent the levels of Employment in Information and Communication while darker colors indicate higher levels of Employment in High-Technology Sectors.
- In 2018, the region with the highest value of Employment in High-Technology Sectors was Istanbul with 134.3 thousand people.
- Istanbul was followed by Bati Anadolu and Dogu Marmara with values of 65 and 29.2 thousand people respectively.
- The region with the lowest value of Employment in High-Technology Sectors was Kuzeydogu Anadolu with 1.9 thousand people.
- The average value of Employment in High-Technology Sectors across regions was 25.8 thousand people.
- The region with Employment in High-Technology Sectors closest to the average is Ege with 27.6 thousand people.
- The total amount of Employment in High-Technology Sectors was 309.6.
- The region with the highest value of Employment in High-Technology Sectors (Istanbul) had around 43 percent of the all Employment in High-Technology Sectors in 2018.
- The region with the lowest value of Employment in High-Technology Sectors (Kuzeydogu Anadolu) had around 1 percent of the all Employment in High-Technology Sectors in 2018.
- The variation of Employment in High-Technology Sectors across regions is relatively high as implied by a coefficient of variation of 150 %.

Figure 18.
Employment in Information and Communication and Employment in High-Technology Sectors (2018), Thousands of People



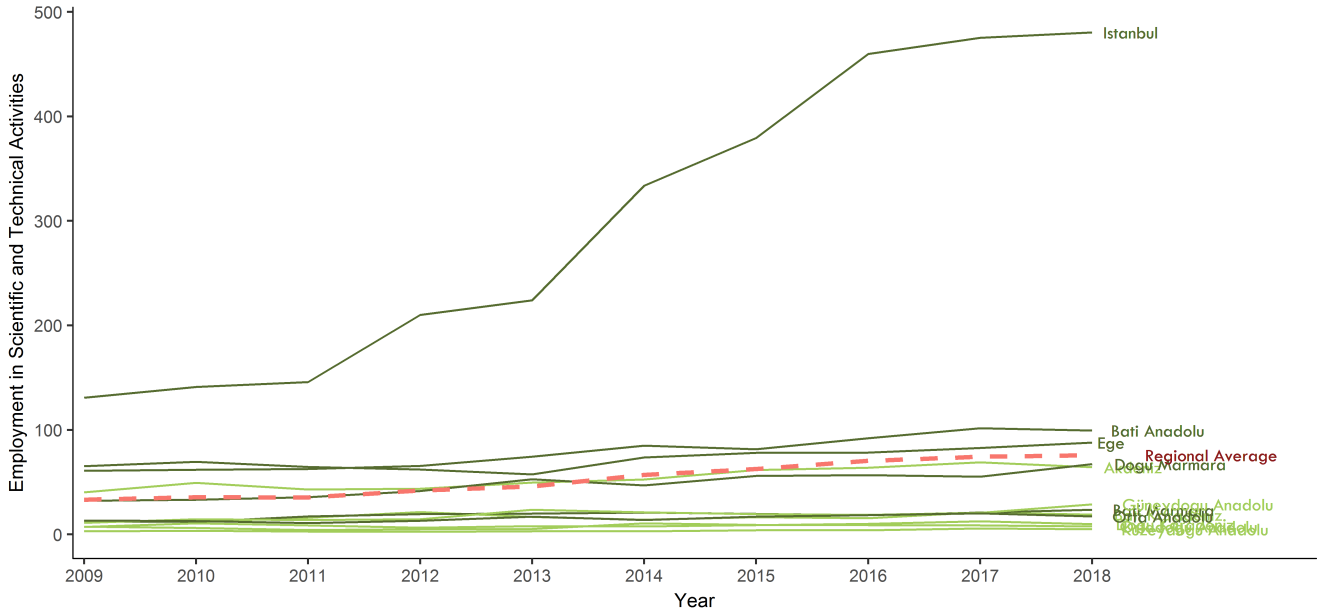
- Employment in Information and Communication and Employment in High-Technology Sectors are reported natural logarithms in the above scatterplot for the purpose of condensing the graph.
- The vertical and horizontal lines represent the mean of ln Employment in High-Technology Sectors and ln Employment in Information and Communication respectively.
- The regions in Quadrant I are those with Employment in Information and Communication and Employment in High-Technology Sectors that are higher than regional averages (Bati Anadolu, Ege, Istanbul, Akdeniz, and Dogu Marmara).
- The regions in Quadrant III are those with Employment in Information and Communication and Employment in High-Technology Sectors that are lower than regional averages (Bati Karadeniz, Bati Marmara, Dogu Karadeniz, Güneydogu Anadolu, Kuzeydogu Anadolu, Orta Anadolu, Ortadogu Anadolu).

Figure 19.
Employment in Information and Communication (2018), Thousands of People



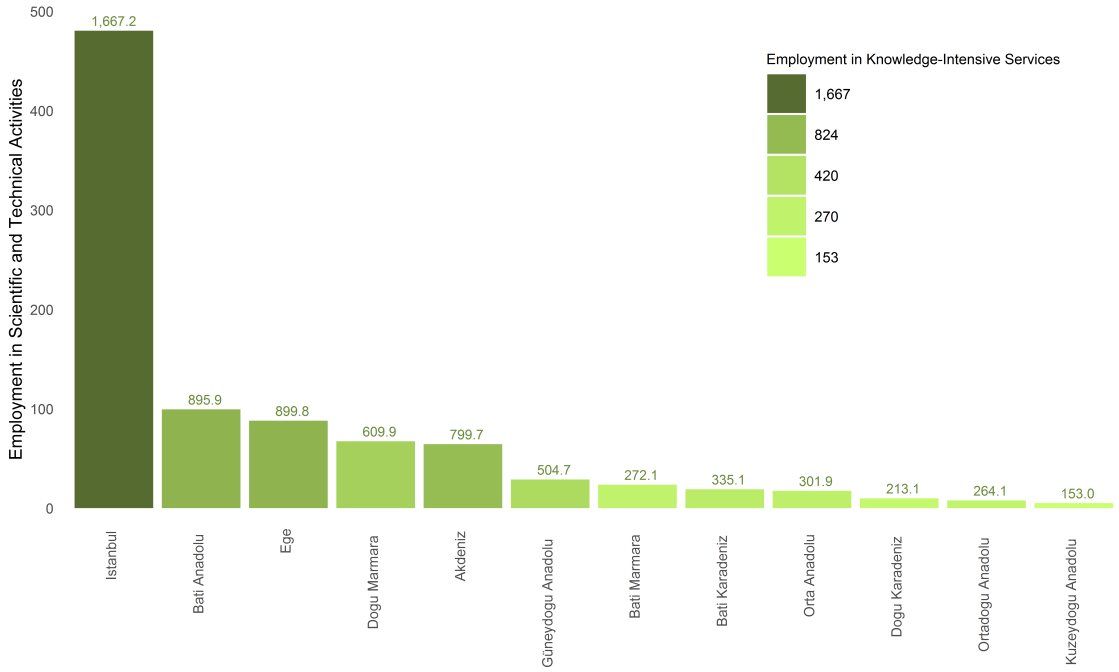
- In 2018, the region with the highest value of Employment in Information and Communication was Istanbul with 105.1 thousand people.
- Istanbul was followed by Bati Anadolu and Ege with values of 44.1 and 20.1 thousand people respectively.
- The region with the lowest value of Employment in Information and Communication was Kuzeydogu Anadolu with 1.8 thousand people.
- The average value of Employment in Information and Communication across regions was 19.2 thousand people.
- The region with Employment in Information and Communication closest to the average is Ege with 20.1 thousand people.
- The total amount of Employment in Information and Communication was 230.8 thousand people.
- The region with the highest value of Employment in Information and Communication (Istanbul) had around 46 percent of the all Employment in Information and Communication in 2018.
- The region with the lowest value of Employment in Information and Communication (Kuzeydogu Anadolu) had around 1 percent of the all Employment in Information and Communication in 2018.
- The variation of Employment in Information and Communication across regions is relatively high as implied by a coefficient of variation of 154 %.

Figure 20.
Employment in Professional, Scientific, and Technical Activities (2009 – 2018), Thousands of People



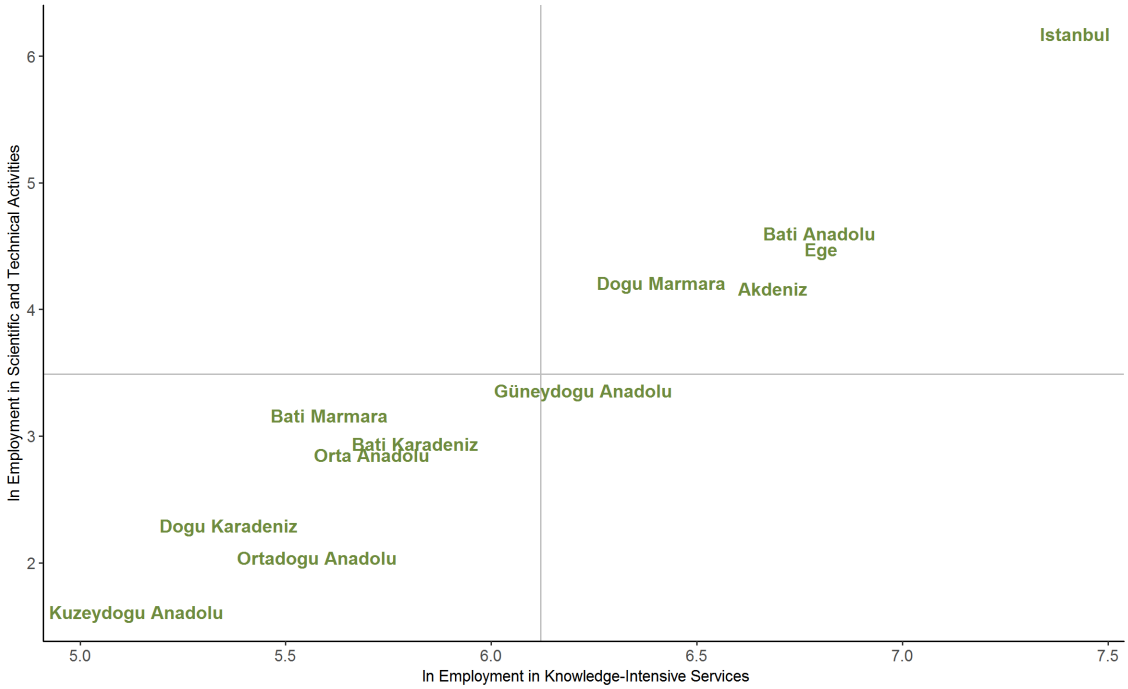
- The average regional change in Employment in Professional, Scientific, and Technical Activities has been 129.4 percent between 2009 and 2018.
- The region that experienced the highest absolute change is Istanbul with 349.8 thousand people.
- The region that experienced the lowest absolute change in Employment in Professional, Scientific, and Technical Activities is Ortadogu Anadolu with 0.4 thousand people.
- The region that experienced the highest percentage change is Istanbul with 267.6 percent.
- The region that experienced the lowest percentage change is Ortadogu Anadolu with 5.5 percent.
- The region that experienced a percentage change that is closest to the regional average of Employment in Professional, Scientific, and Technical Activities was Dogu Marmara with 109.7 percent.

Figure 21.
Employment in Professional, Scientific, and Technical Activities (2018), Thousands of People



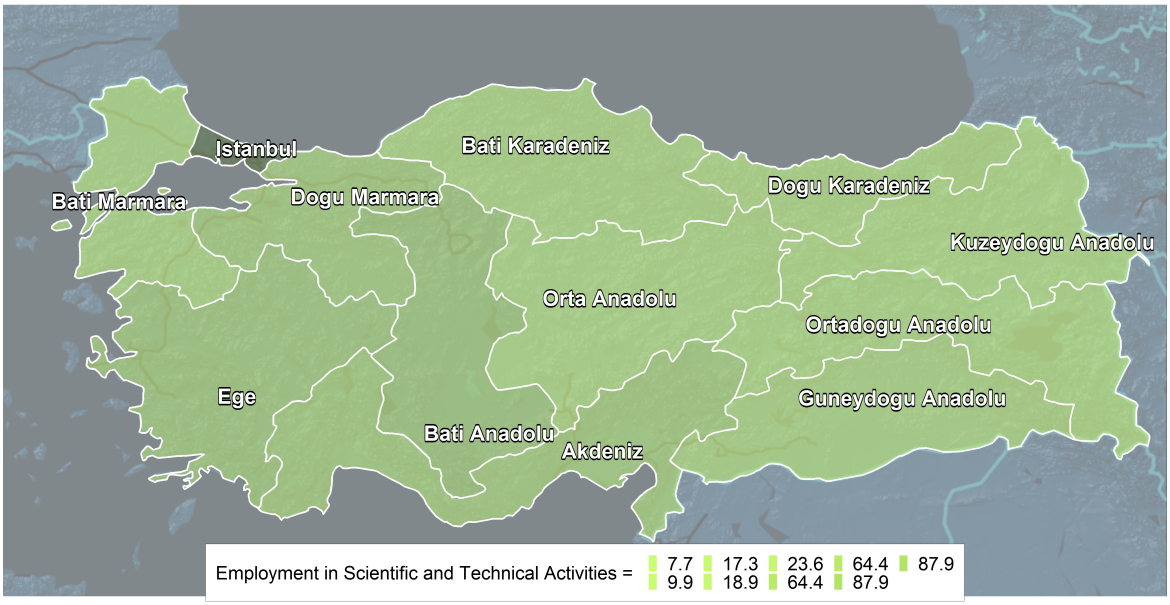
- Bars represent the levels of Employment in Professional, Scientific, and Technical Activities while darker colors indicate higher levels of Employment in Knowledge-Intensive Services.
- In 2017, the region with the highest value of Employment in Knowledge-Intensive Services was Istanbul with 1,667.2 thousand people.
- Istanbul was followed by Ege and Bati Anadolu with values of 899.8 and 895.9 thousand people respectively.
- The region with the lowest value of Employment was observed in Kuzeydogu Anadolu with 153 thousand people.
- The average value of Employment in Knowledge-Intensive Services across regions was 576.4 thousand people.
- The region with the Employment level that is closest to the average is Dogu Marmara with 609.9 thousand people.
- The total amount of Employment was 6,916.5.
- The region with the highest value of Employment in Knowledge-Intensive Services (Istanbul) had around 24 percent of the all employment in this sector in 2017.
- The region with the lowest value of Employment in Knowledge-Intensive Services (Kuzeydogu Anadolu) had around 2 percent of the all Employment in High-Technology Sectors in 2017.
- The variation of Employment in Knowledge-Intensive Services across regions was relatively low as implied by a coefficient of variation of 76 %.

Figure 22.
Employment in Professional, Scientific, and Technical Activities and Knowledge-Intensive Services (2018), Thousands of People



- Employment in Professional, Scientific, and Technical Activities and Employment Knowledge-Intensive Services are reported natural logarithms in the above scatterplot for the purpose of condensing the graph.
- The vertical and horizontal lines represent the mean of ln Employment in Knowledge-Intensive Services and ln Employment in Professional, Scientific, and Technical Activities respectively.
- The regions in Quadrant I are those with Employment in Professional, Scientific, and Technical Activities and Employment in Knowledge-Intensive Services that are higher than regional averages (Bati Anadolu, Ege, Istanbul, Dogu Marmara, Akdeniz).
- The regions in Quadrant III are those with Employment in Professional, Scientific, and Technical Activities and Employment in Knowledge-Intensive Services that are lower than regional averages (Bati Karadeniz, Bati Marmara, Dogu Karadeniz, Güneydogu Anadolu, Kuzeydogu Anadolu, Orta Anadolu, Ortadogu Anadolu).

Figure 23.
Employment in Professional, Scientific, and Technical Activities (2018), Thousands of People



- In 2018, the region with the highest value of Employment in Information and Communication was Istanbul with 480.5 thousand people.
- Istanbul was followed by Bati Anadolu and Ege with values of 99.4 and 87.9 thousand people respectively.
- The region with the lowest value of Employment in Information and Communication was Kuzeydogu Anadolu with 5 thousand people.
- The average value of Employment in Information and Communication across regions was 75.9 thousand people.
- The region with Employment in Information and Communication closest to the average is Dogu Marmara with 67.3 thousand people.
- The total amount of Employment in Information and Communication was 910.7 thousand people.
- The region with the highest value of Employment in Information and Communication (Istanbul) had around 53 percent of the all Employment in Information and Communication in 2018.
- The region with the lowest value of Employment in Information and Communication (Kuzeydogu Anadolu) had around 1 percent of the all Employment in Information and Communication in 2018.
- The variation of Employment in Information and Communication across regions is high as implied by a coefficient of variation of 173 %.

3 Conclusion

The indicators summarized in this report represent outcomes regarding the science and technology sector and the technical progress related determinants of the regions of Turkey. A wide gap between Istanbul and the rest of the country is visible for almost all variables. This observation is in parallel with the existing economic and social regional disparities in Turkey.

The report also illustrates the evident issue of insufficient spatial data for Turkey. The data is grouped – in a seemingly arbitrary manner – such that locations like the capital Ankara and the relatively minor city Karaman, or the touristic center of Antalya and Kahramanmaras are in the same statistical region. Aside of the 81 NUTS 3 regions of Turkey which are actual provinces, the other NUTS groupings do not correspond to any governance structure. Therefore, it is particularly essential that indicators should be reported in the provincial level as well. Forming supra-regional groups is a realizable task for researchers, while disaggregating indicators that are only available for large "regions" that are merely statistical constructs is impossible.

Furthermore, most regional indicators for the EU countries are also disaggregated by industry. While such disaggregated figures are available for Turkish regions for certain indicators, most other variables are reported without a regional dimension. This drawback is further exacerbated due to the earlier discussed regional grouping practice. This being said, in the recent years newly designated informative indicators are reported. Nevertheless, the aforementioned regional groupings and the lack of industry-specific classifications create a substantial challenge for researchers and policy-makers – particularly when the goal is to provide policy-related findings regarding the concentration of economic activity over space in Turkey.

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