TURKEY ON HER WAY OUT OF MIDDLE-INCOME GROWTH TRAP

VOLUME 1: WHICH TURKEY? MACRO AND REGIONAL ANALYSIS

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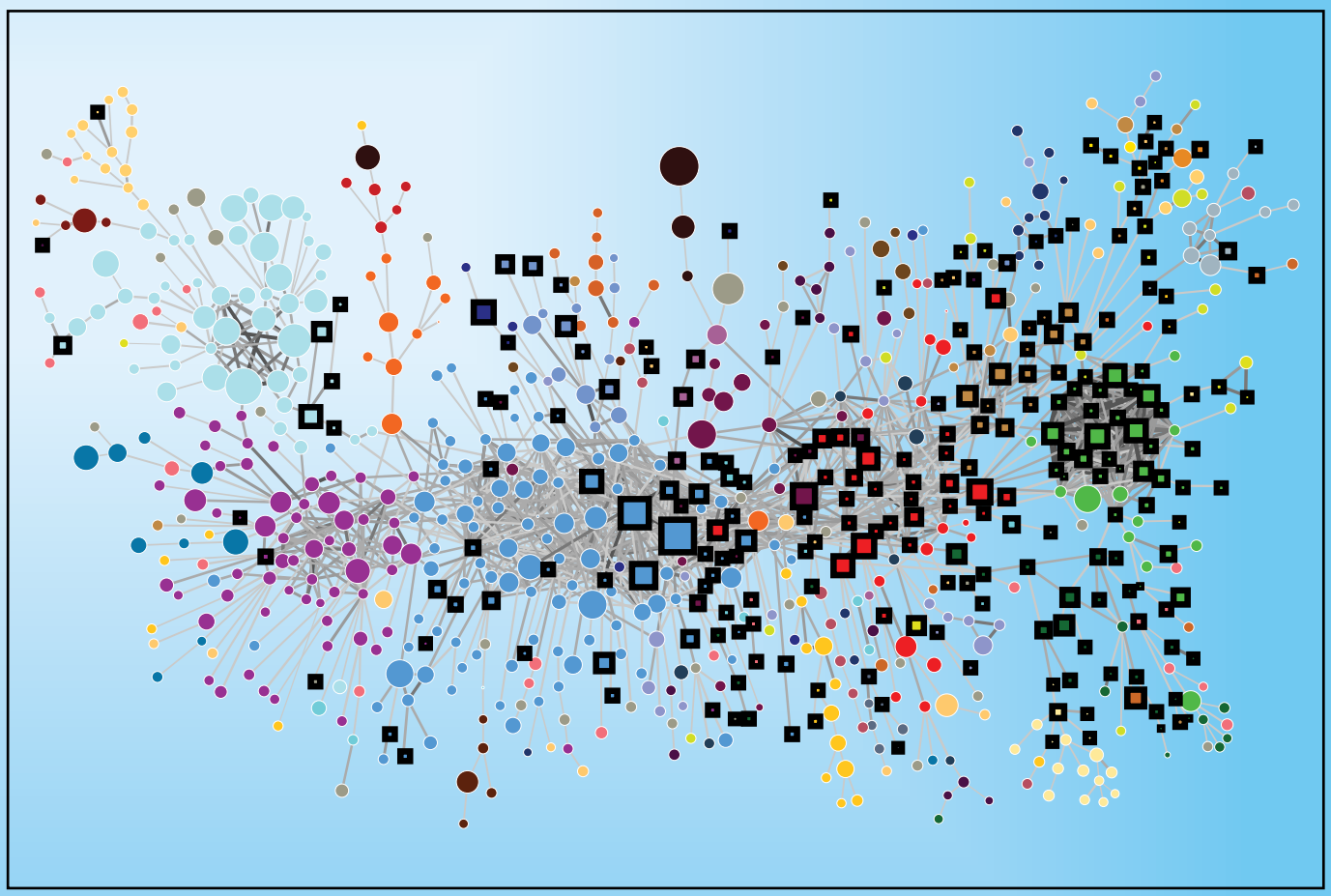

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TURKISH ENTERPRISE AND BUSINESS CONFEDERATION

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ACRONYMS

ASEAN	:	Association of Southeast Asian Nations
BEC	:	United Nations – Classification by Broad Economic Categories
BG	:	Basic Goods
CAGR	:	Compound Annual Growth Rate
Central Region	:	Developed region with an economy largely based on industry
COMTRADE	:	United Nations – International Trade Database
Emprical	:	Experimental and measurement based
EU	:	European Union
EUROSTAT	:	European Union Statistics Office
FCaG	:	Final Capital Goods
FCG	:	Final Consumption Goods
GaWC	:	Globalization and World Cities Study Group and Network
GDP	:	Gross Domestic Product
GRO	:	Gross Regional Output
GVA	:	Gross Value Added
IMF	:	International Monetary Fund
ISIC	:	International Standard Industrial Classification
KGM	:	General Directorate of Highways
Level-2 Regions	:	26 Level-2 regions according to the Classification of Statistical Regional Units by Turkish Institute of Statistics
MTP	:	Medium-Term Plan
NACE	:	Nomenclature statistique des Activités économiques dans la Communauté Européenne
OECD	:	Organization for Economic Cooperation and Development
Peripheral Region	:	Underdeveloped regions whose economy is dominated by primary sectors
PIM	:	Perpetual Inventory Method
PPP	:	Purchasing Power Parity
RCA	:	Revealed Comparative Advantage
R&D	:	Research and Development
SG	:	Semi-finished goods
SMSE	:	Small and Medium Size Enterprise
TFE	:	Total Factor Productivity
TFP	:	Total Factor Productivity
TÜRKONFED	:	Turkish Enterprise and Business Confederation
TÜİK	:	Statistics Institute of Turkey
UN	:	United Nations
US	:	United States of America

EXECUTIVE SUMMARY

Although quite complex, development stories of countries and regions are still explainable to a certain extent. This process encompasses the transfer of labour force and capital used in low productivity economic activities to the sectors and industries with high productivity, capital accumulation, and industrialization, transition to new production structures by using new production techniques, urbanization, new social institutions and cultural change. While new theories and approaches have their appeal, development episodes of countries including specific economic policies pursued and how various stages were completed are still contested topics for economists.

The basic objective for any country taking steps forward in the process of development is to improve the level of welfare of its people or, to put it more clearly, to ensure a stable increase in per capita national income. However, many recent studies reveal that this stable course of increase had not been possible for many countries and regions; and there were backward trends in national incomes of quite some countries. Leaving Sub-Saharan Africa aside, there is mention of a *Middle-Income Trap* risk for some developing countries including Turkey, Brazil, China, Thailand and Poland, each of which has a considerable size of population.

So what is the "Middle-Income Trap"? It is a problem of developing countries that had reached a given level of progress and maturity in per capita income. In its simplest definition, it is understood to be a situation where countries and/or regions attaining a specific ("middle") income level get stuck at that interval, with a serious lag before re-accelerating to higher income levels. Though there is no rigid definition, the yardstick of not being able to move beyond the 58% of per capita income of the US is frequently referred as a critical threshold. Given this recognition, many questions arise: How does a country attain (and get trapped at) the middle-income level? Provided this state of affairs has indeed been the case, how long does it take to get out of this "trap"? How should this transition occur? What is the "best and fastest" way of transforming a given economic structure? What measures should be taken in relation to human resources and foreign policy, product design and position in global competition?

In order to speak about the middle-income trap risk for a country or region, firstly it is required that this country or region is in the process of transition from a state where primary industries and the subsistence economy were dominant, to another state where there is the predominance of a labour-intensive manufacturing industry capable of producing under relatively more advanced technology. Increasing the competitiveness of this manufacturing industry in the global markets is another prerequisite for attaining middle-income level.

After this brief definition, let's summarize how Middle-Income Trap risk gets itself in the agenda of Turkey.

In his article published on 10 September 2012, Prof. Murat YÜLEK, a columnist writing on economic affairs in daily *Dünya* reminded that, *"Prof. İbrahim Öztürk from the Marmara University, writing articles in economics in papers Zaman and Today's Zaman is the first person introducing the concept of Middle-Income Trap in the context of Turkey. In June last year, he wrote three articles under the title 'Saving Turkey from the middle-income trap."* Prof. Yülek explains the risks of this trap for Turkey as follows: "*There are many problems that countries caught in Middle Income Trap face. These include, turning into an open market, excessive dependence to imports and short and long term liabilities that may disturb financial balances. Turkey's current deficit now exceeding 8% in spite of the rate of growth falling under 5% can be considered as one of the symptoms of MIT."*

- The 2012 report by the MÜSİAD titled "*New Threshold on the Road to Development: MIDDLE-INCOME TRAP*" continued to maintain the issue in the current agenda,
- Güngör Uras wrote about technology policy and Turkey's position vis-á-vis Korea in *Milliyet* on 26 June 2012,
- Metin Ercan underlined the relationship of the issue with education in *Radikal* on 4 August 2012,
- Ege Cansen pointed out to the necessity of transforming economic structure in *Hürriyet* on 12 September 2012,
- Okan Müderrisoğlu wrote about the need for reform in his article in *Sabah* on 23 September 2012,
- Prof. İbrahim ÖZTÜRK commented on the mention of Middle-Income Trap in the Medium-Term Plan in *Zaman* on 11 October 2012.

Perhaps the most striking comment coming from columnists in economics was that of Şeref OĞUZ writing in *Sabah* on 20 September 2012, *"Turkey cannot get out of middle income trap unless our governing cadres get themselves out of middle intelligence trap."*

Since middle income trap is a growth related problem, it is also directly related to production structures in the country and in its regions. Thus, the components of these structures which are enterprises, labour force, employment, sectors, regions, levels of technology, foreign trade, product design, incentives and support mechanisms all need to be analysed in detail in defining the problem and developing suggestions for solution.

The present study first defines the problem in detail at the national scale, exposes the international position of Turkey and investigates further the possibility of a "*product trap*" in terms of foreign trade patterns. It puts the rationale of the question "Which Turkey?" first, and distinguishes itself from other studies by seeking answers first and foremost to the question of regional income disparities within the national economy at large. We believe that for the first time in Turkey the present study identifies regions and their stages in development with respect to aggregate production structures, technology levels of sectors and foreign trade patterns, and engages in assessing the middle income trap risk on not only on the *national*, but also on a *regional* basis. While responding to the question "Which Turkey?", our study underlines many relevant findings for some relatively more developed regions of the country, which is counter-balanced by rather pessimistic ones for other, more backward regions.

The objective of this Volume-1, then, is not to introduce simple ready-made solutions to all prolonged and chronic problems of Turkey, but to offer a framework of analysis as the basis of solutions and to "diagnose" the problem clearly in regional and sectorial terms in the light of analytical findings and carefully developed data. These can be summarized as follows by respective sections:

- Throughout the Republican era (1923-2011) Turkish economy enjoyed an annual rate of growth in real terms by 4.5%. Rates of growth in different periods are as follows: The so-called Özal years during the period 1980-88 (5.2%); the periods of unregulated financial liberalization (1989-1997) and close IMF monitoring (1998-2012/3.8%) and the sub-period of the latter after 2003 (4.8%).
- The period of remaining in middle-low income level which was 17 years in the People's Republic of China is longer than 50 years for Bulgaria and Turkey. Turkey reached middle-low income level in 1955 and it took 50 years to attain middle-high income level in 2005. Turkey is one of the three countries (others are Bulgaria and Costa Rica) where the status of middle-income country lasted the longest in relative terms.
- The trend of Total Factor Productivity (TFP) in Turkey was positive in the period 1980-89. In the period 1990-1999, TFP exhibited a highly fluctuating trend and it tended to fall in the period after

2000. In spite of leaving behind the fluctuating trend of the 1990s, do our findings suggest the existence of a "productivity fatigue" in the 2000s?

- The study shows that the most important obstacle to capital accumulation is diminishing rates of return. Altuğ, Filiztekin and Pamuk (2006), on the other hand, stress that the problem stems not from excessively capital-intensive growth of Turkey but from slow growth in capital stock in general.
- As a matter of fact, the new literature on economic growth demonstrates that there are direct and strong relations between education, knowledge (R&D) and other social infrastructure spending and national income growth. Investments in education and training directly contribute to higher labour productivity and provide significant externalities for sustainable growth. Additionally, R&D activities carried out by public and private sectors lead to capital accumulation by enhancing information and knowledge base. So economic growth is fed by two mutually reinforcing sources: Education/training and accumulation of R&D capital. To enhance labour productivity, investments in education and training that ensure qualified labour stock are essential.
- While it is possible to speak about various factors determining the duration of "remaining" trapped in the middle income group; and those conditions that set the character and pace of leaving this stage behind (such as macroeconomic stability, structural conditions, quality of relevant institutions etc), it is worthwhile stressing the critical nature of transition from low to high productivity activities.
- As stressed in the works of Hidalgo and Hausmann (2009), Hausmann et al. (2007) and Hidalgo et al. (2007), in attaining higher income group along with economic development, it is critical to ensure transition from merely re-producing the same group of goods more and more efficiently to more diversified goods and productive activities.
- Beginning from the late 70s when the Turkish economy started to integrate with global markets, the change in the volume of foreign trade which displayed insignificant increases at early periods later gained momentum in the 90s and particularly in the 2000s. In the process, the export pattern of the 70s that was largely consisting of agricultural goods shifted to textiles and garments in the 80s. The textiles and garment sector maintained its weight until the mid-90s as the main force driving Turkey's integration with other economies in the world. Starting from the 2000s, machinery, automotive and electronic devices have been goods whose shares in total exports rising significantly.
- The export pattern of Turkey which, in the 70s, consisted mainly of agricultural products, then moving to traditional labour-intensive sectors in the 80s and shifting over to sectors with "middle-low" and "middle-high" technology in the 90s, also reflects transformations that the production sectors of the economy underwent.
- For the period 1996-2001, the shares of capital goods, intermediate goods and consumption goods in total imports are 17.5%, 70.6% and 11.4%, respectively. In this period, considered together with the rising share of intermediate goods in exports, the steady decline in the share of capital goods against steady increase in the shares of intermediary and consumption goods in total imports suggest shifts in foreign trade and therefore in the composition of the production of value added.
- For the Textiles (17) sector, if the change over time of comparative advantage indicator of selected countries at different stages of production process is examined, it appears that in this specific sector that had traditionally been specialized in, Turkey is losing its comparative advantage in intermediate, semi-finished and final consumption goods in the face of increasing competition.
- A general observation suggests that the market share of Turkey in the group of low-technology goods is getting larger along with sectors enjoying high rates of growth. Given the high share of EU-15 countries in the group of countries considered, it is possible to conclude that Turkey continues to

specialize in exports of low-technology goods to industrialized countries.

- On the other hand, Turkey's market share in the group of Chemicals (24) which enjoys high demand at all stages of production is extremely slow. In terms of middle-high technology group of goods, those that Turkey has serious market share are quite limited.
- In the sector of Medical Devices, Precision Optical Devices and Watches (33) which is mainly dominated by advanced economies, Turkey's foreign trade share is too small (average share in total exports for the 2000s is 0.29%, average share in imports is 2.1%) and the country is disadvantaged in the global market for all stages of production in this sector.
- It must be recognized that regional development needs to be addressed from an economic perspective and negative social phenomena derive from poorly focused economic perspectives. In this context, another reason why desired success could not be attained in regional development policies is the fact that regional development is not sufficiently fed in by various other fields including agricultural development, site selection for industries, transportation, capital movements, monetary policy and the finance system, foreign trade and international relations.
- Turkish economy does not display a homogeneous structure and given its heterogeneity, centrifugal-centripetal effects may play in differently in the context of centre-periphery relations. It is to the extent that economic relations between Diyarbakır and Şanlıurfa as two neighbouring provinces are much less developed than economic relations between any of these two provinces with İstanbul.
- While in 2004 there were only 10 Level-2 regions above the threshold of 10 billion $ of gross regional output (GRO), this number increased to 21 as of the year 2011. Of these 21 regions 5 have GRPs with 50 billion $ and above. These regions also enjoy rather strong industrial production and attract foreign investments. There are 16 regions in the interval 10-30 billion $ while 5 regions have their GRPs under 10 billion $. In terms of their GRO levels it can be said that there are 5 developed, 16 developing and 5 underdeveloped regions.
- However, it is observed that the rate of increase in Gross Regional Output has slowed down in the period 2008-2011 under the effect of the global crisis. Nevertheless, it is a positive sign that compared to industrialized economies of the US and EU, there was no backward turn and all regions preserved their position in terms of GRO.
- GRO values of level-2 regions are attached on the map of region levels in the new system of incentives declared on 6 April. Drawing a line on this map extending from Zonguldak to Hatay, 601 billion $ of national product amounting to 772.3 billion $ (78%) is accounted for by 12 regions to the west of this line covering 30 provinces. The remaining part of 171.3 billion $ is by 14 eastern regions covering 51 provinces. In 2011, four regions, namely TR10 İstanbul and TR51 Ankara, TR41 Bursa, Eskişehir, Bilecik and TR42 Kocaeli, Sakarya, Bolu, Düzce, Yalova together stand for **376 billion US$** part of total national product.

To underline the importance of this size represented by 4 regions mentioned above, some international comparisons can be made. A size amounting to **376 billion $** is**:**

- about the total for Finland (194 billion $) and Hungary (196 billion $),
- larger than the total for Iraq (139 billion $) and Israel (237 billion $) and
- larger than that of Greece (294 billion $), Norway (266 billion $), Romania (267 billion $), Singapore (315 billion $) and Switzerland (354 billion $).

- As another agglomeration area, the triangle TR31 İzmir, TR33 Manisa, Kütahya, Afyon, Uşak and TR33 Denizli, Aydın, Muğla, contributed **115 billion $** to national product in 2011. The third

agglomeration with contribution exceeding 50 billion $' is TR61 Antalya, Isparta, Burdur, TR51 Konya, Karaman and TR62 Adana, Mersin with **79 billion $**.

- Against these rather pleasing developments in western regions, slow rates of growth in the east are worth noting. Leaving aside few semi-central provinces like Kayseri, Gaziantep and Kahramanmaraş presently moving forward in industrialization, too slow rates of growth and increase in welfare levels in terms of per capita income in the rest of the east of the country suggests that outmigration and many social problems associated with it will remain in the agenda.
- Thus, without doing any injustice to the success of our rapidly developing and competitive regions that are integrated with the rest of the world, developing different development prescriptions for slowly developing and backward regions is a must for Turkey on her way towards "Vision 2023".
- According to GRO estimates for the years 2004, 2008 and 2011, per capita income in TR10 İstanbul region was $8,974 in 2004. After 8 years, this figure has almost doubled to reach $15,674 as of the end of 2011. The average per capita income for the country increased from $5,764 to $10,335 in the same period.
- In the period 2004-2008, the proportion of per capita incomes to per capita income in the US has strikingly increased in all regions and the distance in-between has become considerably smaller. However, the rate of increase slowed down in the period 2008-2011 with the impact of the global crisis. According to the table above, regions can be classified as those with per capita income exceeding 30% of that in the US, those in the interval 29-19% and others. Following this approach, regional groups are presented in the chart below in terms of middle-income trap.

As of 2011:

(i) 6 regions immune from the middle-income trap Risk:

TR10 İstanbul,

TR42 Kocaeli, Sakarya, Bolu, Düzce, Yalova,

TR41 Bursa, Eskişehir, Bilecik,

TR51 Ankara,

TR21 Tekirdağ, Edirne, Kırklareli

TR31 İzmir,

(ii) 12 regions with Middle-Income Trap Risk:

TR61 Antalya, Isparta, Burdur,

TR22 Balıkesir, Çanakkale,

TR81 Zonguldak, Karabük, Bartın,

TR32 Aydın, Denizli, Muğla,

TR33 Manisa, Afyon, Kütahya, Uşak,

TR62 Adana, Mersin,

TR90 Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane,

TR52 Konya, Karaman,

TR83 Samsun, Tokat, Çorum, Amasya,

TR71 Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir,

TR72 Kayseri, Sivas, Yozgat,

TR82 Kastamonu, Çankırı, Sinop

(iii) 8 regions in Middle-Low Income Group:

TR63 Hatay, Kahramanmaraş, Osmaniye

TRA1 Erzurum, Erzincan, Bayburt

TRB1 Malatya, Elazığ, Bingöl, Tunceli

TRC1 Gaziantep, Adıyaman, Kilis

TRC3 Mardin, Batman, Şırnak, Siirt

TRA2 Ağrı, Kars, Iğdır, Ardahan

TRC2 Şanlıurfa, Diyarbakır

TRB2 Van, Muş, Bitlis, Hakkari.

- The country average fits the group of regions facing middle income risk. Taking 2004 as basis, 12 out of 22 regions of Turkey in the Middle-Low Income group jumped to the higher group as of the end of 2011 while 2 of them jumping higher to the first group immune from the middle-income trap. In 2004, TR10 İstanbul, TR42 Kocaeli, Sakarya, Bolu, Düzce, Yalova, TR41 Bursa, Eskişehir, Bilecik and TR51 which used to be in the group facing the risk moved to the first group in 2004. 8 regions that were in the Middle-Low income group in 2004 could not alter their groups despite significant increases in their per capita GRO values.
- When regions are ranked according to the proportion of agricultural value added to population, eastern provinces where rural population is dominant appear at the bottom of this list. This fact contradicts the general discourse that the "economies of these regions are based on agriculture." In fact, these regions face the problem of marketization; agricultural production is for mere subsistence rather than being an economic activity in proper sense and it is mostly supported by direct and indirect social transfer mechanisms.
- The regions where industrial produce per population is high are as follows: TR41 Bursa, Eskişehir, Bilecik, TR42 Kocaeli, Sakarya, Yalova, Bolu, Düzce and TR21 Tekirdağ, Kırklareli, Edirne. In addition to their internal development dynamics, this position of regions mentioned also derive from their geographical proximity to TR10 İstanbul region, which contributes 213 billion $ to national economy as of the end of 2011 and which has a foreign trade volume of 181 billion $. It is clear from 2004 and 2008 figures on TR21 Tekirdağ, Kırklareli, Edirne region that what Krugman calls agglomeration effects is specifically valid for this region. The set back that TR10 İstanbul region faced in this period suggests that the region has already reached its limits in terms of existing industrial infrastructure and it consequently dispatches additional-excess demand to nearby regions.
- For the same period, we see a backward trend in TR31 İzmir region while TR51 Ankara region maintained its position. As far as industrialization is concerned, 6 regions at the bottom of ranking are from the underdeveloped eastern triangle which appears at level 6 in the new system of incentives.
- With respect to services sector, the region contributing most to local welfare is TR10 İstanbul region. İstanbul is followed by TR51 Ankara where the number of public employees is relatively high and TR31 İzmir. Hence the table is as follows: TR10 İstanbul as the "national economic centre" of Turkey with an economy of 772.3 billion$; TR51 Ankara as "public centre" producing policies and wisdom with its public sector institutions, strong university-research centres, advanced technological infrastructure and qualified human resources and finally TR31 İzmir as a trade centre preserving its historical position with its foundations for foreign trade and industry.
- In highly industrialized TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova region too, shift to services, although slightly, may be seen as transition to supplementary services as a result of saturation of industrial sectors. As in the case of industry, it is the eastern and south-eastern regions where the contribution of services sector to regional welfare is very limited.

- It must be clear that analysing per capita income values alone would not be enough in properly assessing middle-income trap risk. The causes of this risk are immanent in economies of countries and regions. Hence, it will be appropriate to analyze in detail the economies of different regions in Turkey. By "analysing in detail" we refer to examining production, labour force and financial markets included in the periodic flow chart of economies together with their interactions as well as their relations with the rest of the world (i.e. imports-exports with respect to production of goods and services; migratory flows with respect to labour force and direct-indirect foreign investments with respect to the financial market).
- The approach adopted to identify the levels of technology is an **index** based on sector wise aggregation of technology levels of regions, which itself was derived from TÜİK's Regional-Annual Business Statistics covering the period 2003-2008.
- Agénor et al. (2012) outline the process in which a country or region gets caught in Middle-Income Trap as follows:
    - When countries graduate from low to middle income group, labour force shifts from agriculture to labour-intensive and low-cost sectors in manufacturing industry.
    - The economy experiencing a delayed development process ensures increases in labour productivity by using imported technologies and, labour force in agriculture shifts to manufacturing industry.
    - After a certain period, the possibilities for the pool of unqualified labour to transfer to other sectors shrink as employment in this area reaches its peak and employment generation capacity of the economy gets weaker.
    - When countries and regions in this group reach middle-income level, real wages in urban manufacturing industries rise, labour costs increase and competitive power of producers diminish together with switch to imported foreign technology.
    - Increases in productivity hitherto obtained through the composition of production, sectorial shifts and imported technology wanes, international competitiveness starts melting down, economic growth and increase in total output slows down and the economy finds itself in middle-income trap. As a result of this spiral, no transition to the higher income group takes place.
- The taxonomy developed for the present study introduces a 5-level classification with respect to regions' levels of development based on the intensity of technology in their leading economic sectors.
- According to the number of enterprises and local units, regions with advanced levels of technology are R51 Ankara, TR10 İstanbul, TR41 Bursa, Eskişehir, Bilecik, TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova, TR31 İzmir, TR81 Zonguldak, Karabük, Bartın, TR72 Kayseri, Sivas, Yozgat and TR21 Tekirdağ, Edirne, Kırklareli.
- In terms of the number of working people, TR51 Ankara region is at the top of the list. Ankara is followed by industrially developed regions of TR41 Kocaeli, Sakarya, Düzce, Bolu, Yalova, TR10 İstanbul and TR41 Bursa, Eskişehir, Bilecik. While remaining below the country average, it is interesting to note that TR72 Kayseri, Sivas, Yozgat region has a higher status.
- In terms of salary and wage payments, regions at the highest levels of technology are TR51 Ankara, TR10 İstanbul, TR41 Bursa, Eskişehir, Bilecik, TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova and TR31 İzmir. Salaries and wages constitute one of the essential factors in enterprises' site selection and labour force mobility. Wage flexibility of qualified labour force is higher relative to other groups of labour force. In Ankara, wages paid to qualified labour force are higher than the corresponding rate

of employment. Wages of those working with advanced technology in such industrialized provinces as İzmir, Kocaeli and Bursa are lower than that of their counterparts in Ankara.

- With respect to total annual turnover of enterprises, regions with high technology are TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova, TR51 Ankara, TR10 İstanbul and TR41 Bursa, Eskişehir, Bilecik. The regions at the bottom of the list are the same with those having the least number of enterprises. Another common characteristic of these regions is that they are all giving migration out.
- In terms of investments, high technology regions are TR10 İstanbul, TR41 Bursa, Eskişehir, Bilecik, TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova and TR51 Ankara. It is only natural that regions where the scale of enterprises are also the leading ones in gross investments in material goods. The difference between investments and operating capital/turnover stems from the fact that large-scale enterprises in these regions import goods at higher levels of technology relative to their production structures while supplying relatively low technology goods. Ankara is characterized by employing more qualified labour force at relatively smaller enterprises and paying higher wages compared to other regions.
- Across the level-2 regions in Turkey, the one with the highest level of technology is TR51 (Ankara), followed by regions TR10 (İstanbul) and TR42 (Kocaeli, Sakarya, Düzce, Bolu, Yalova). Other regions with index value higher than 2.5 are TR31 (İzmir), TR41 (Bursa, Eskişehir, Bilecik) and TR81 (Zonguldak, Karabük, Bartın). The country average increased from 2.26 to 2.43 from 2003 to 2008. The lowest ranking regions are TRA2 (Ağrı, Kars, Iğdır, Ardahan) and TRB2 (Van, Muş, Bitlis, Hakkari).
- It is observed that regions enjoying highest increase in per capita GRO are, at the same time, those with the advanced technology levels. These regions are already forcing the boundaries of this level to graduate to middle-high technology level. It is not surprising that, according to 2011 per capita GRO data, these regions are among those that seem to overcome the middle-income trap risk.
- The average national income in the period 2003-2008 as well as increases in per capita incomes and technology levels of regions reflects the rapid growth and transformation in the composition of production experienced in this period.
- As can be seen in data supplied, while accounting for 40% of our country's total tax revenues, TR10 İstanbul region is, at the same time, the main source of Turkey's foreign trade deficit. Indeed, while foreign trade deficit of Turkey was 104 billion $ in 2011, İstanbul's deficit was 62.3 billion $. Within the last 10 years, the cost of the foreign trade composition of İstanbul to the country was 316.5 billion $. In this respect, İstanbul is followed by TR51 Ankara with 26.3 billion $, TR63 (Hatay, Osmaniye, Kahramanmaraş) with 12.6 billion $, TR81 (Zonguldak, Karabük, Bartın) with 12.3 billion $ and finally TR31 İzmir with 5.8 billion $.
- There is a serious difference between the number of exporting and importing firms in Turkey. In 2011, there are 54,553 exporting firms while the number of importing firms is 66,872.
- The TR33 Manisa, Afyon, Kütahya, Uşak region as an exporter stands as the closest one to middle-high technology level in terms of exportation. This fact can be explained by the existence of many high technology enterprises in the region. This region is followed by TR41 Bursa, Eskişehir, Bilecik region where automotive industry has its weight (index value: 3.486), TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova region coming to the fore with its strong infrastructure in automotive, chemicals, textiles etc (index value: 3.465) and TR51 Ankara region with its high technology enterprises and technology development centres (index value: 3.282). Taking export data from respective regions, we see that while their export volumes are quite low, regions such as TRA1, TRA2, TRB2 and TR71 may come to the fore due to their existing export sectors. The total exports from 16 provinces in these 4 regions are less than 2 billion $ in 2011.

- The technology balance of İstanbul's foreign trade remained stagnant in the period 2002-2011. This means that the difference between exports and imports in the given technology composition continued and İstanbul remained as a region exporting middle-low technology while importing middle-high technology. The cost of this for 2011 is the foreign trade deficit amounting to 62.5 billion $. Given this, the reason for larger foreign trade deficit in 2011 compared to smaller one in 2002 is increases in production capacity and volume of foreign trade.
- Development does not consist of stability in macroeconomic indicators ensured at the national level. Each country has its interrelated but different local and regional dynamics together with historically shaped social structures, internal dynamics and emerging competitive sectors.
- İstanbul is at the top of the list in terms of both total and per capita value added. It also leads the list with its rate of urbanization of 99 percent. The level-2 region with the lowest per capita gross value added (GVA) is TRB2 (Van, Muş, Bitlis, Hakkari). İstanbul produces more than four times the GVA produced by the region TRB2. The two regions with lowest rates of urbanization, TRA2 (Ağrı, Kars, Iğdır, Ardahan) and TRB2 (Van, Muş, Bitlis, Hakkari) are also at the bottom of the list in terms of per capita income. While per capita income in both of these regions is around 3,500%, the rate of urbanization is below 50%.
- In terms of rate of urbanization, Level-2 regions that follow İstanbul are İzmir, Ankara and TR41 (Bursa, Eskişehir, Bilecik). Though having highest shares in country's total value added, these regions still lag behind some others in terms of per capita GVA. In terms of per capita value added, the Level-2 TR41 (Bursa, Eskişehir, Bilecik) ranks third, Ankara fourth and İzmir sixth. Ranking second in terms of per capita value added, the Level-2 TR42 (Kocaeli, Sakarya, Düzce, Bolu, Yalova) region remains around 80% in rate of urbanization.
- Studies covering OECD countries reveal that chances of employment of population groups with higher education and postgraduate degrees are higher than those labour force groups with lower education status. As for the OECD average, 84 out of every 100 persons with higher education and postgraduate degree are in employment. While this figure is as high as 90 in such developed Nordic countries as Sweden and Norway, it is only 70 in Turkey.
- One of the main reasons why Turkey, as a middle-income country, cannot make it to the high-income group of countries is due to its low labour productivity which, in turn, stems from the level of quality of labour force. In fact, labour productivity in large cities of Turkey which profoundly influence the course of national economy lags far behind the comparable major cities of the world.
- Average years of schooling in Turkey increased to 6 at the end of the 90s while it was 2.14 in 1960. For the year 2011, the average year of schooling per person is 7.2. In the 60s, South Korea was one of those countries facing the middle-income trap as Turkey. However, through achievements and reforms in its system of education, South Korea managed to extend average years of schooling from 5 to 13.34 in 2010.
- Like South Korea, Greece is also among those countries saving itself from the middle-income trap thanks to advances in levels of education. Argentina and Mexico having a similar course of economic development with Turkey, on the other hand, remain in the realm of the trap by exhibiting a low performance in terms of average years of schooling which are 9.8 and 8.4, respectively.

In 2008:

- The Level-2 regions TR51 (Ankara), TR31 (İzmir) and TR41 (Bursa, Eskişehir, Bilecik) enjoy the longest years in schooling with averages as 7.67, 6.81 and 6.7, respectively.

- While average years of schooling for the country is 7.2, there are 11 regions with years of schooling above the country average. The remaining 15 Level-2 regions have years of schooling below the country average.
- As a result of all these analyses, it may be concluded that there is no middle-income trap risk for Turkey as a whole. This conclusion, however, may invite the question "Which Turkey?". Responding to this question, it can be said that there are three different "Turkeys": there is no middle-income trap risk for the first one that is developed and industrialized; such a risk does exist for the second Turkey and, finally, there is the third Turkey for which one can speak not only of middle-income but also poverty risk. Since the "first Turkey" accounts for a very large share of both national product and population and also rooms in administrative, political, economic, commercial, industrial and media-related power centres, delays may be expected in this "Turkey's" awareness about the problems of other regions and in developing pertinent solutions.

Thus, it is inevitable to develop different policy designs for regions at different levels of income and development:

- Focusing on technology-intensive areas and preferring supply-sided policies of incentive in regions that seem to have overcome the middle-income trap risk,
- Developing transportation infrastructure and supporting middle-low and middle-high technology based production in regions with middle-income trap risk,
- For other regions, adopting measures geared to solving the problem of scale in agriculture, ensuring transition from subsistence economy to industrial production and designing demand-side incentives for goods produced in these regions.
- Such regional institutions as development agencies need to be structured in compliance with production characteristics of respective regions. Hence, the composition of development agencies may vary with respect to regions. For example, while there may be a financial development agency in İstanbul responding to the needs of this particular sector, the development agency in regions such as Bursa and Kocaeli may be tailored to the automotive sector in particular and that in Ankara may focus on the sector of informatics.

To investigate possible ways of attaining 2023 targets, Volume 2 which will follow this study aims at engaging in gap analysis first, exposing, in comparative terms, the methods of "rehabilitation" on the basis of this analysis and developing policy options that will be based on economic impact analyses through computable general equilibrium models. To be more specific, the main objective of the study at the present stage is to come up with a dynamic growth model that describes the economic development course of Turkish economy together with medium and long-term sources of growth and, by identifying the impact level of these sources, to discuss whether Turkey is confronted with middle-income trap risk. This also includes the examination of income distribution in terms of regions and sectors.

We believe that this study will help cover an important gap in Turkey in the development of economic policies. The study provides stimulating information to private sector enterprises most of which are SMSEs on the overall trajectory of the country and also gives significant clues to decision makers at government level.

I. INTRODUCTION

I. INTRODUCTION

"Economic growth" and "sources of growth" are phenomena that economists cannot explain very well. According to widely accepted remarks by historians, early phases of economic growth are relatively easy and fast. The transition from traditional agriculture to the manufacture of light consumption goods can be achieved by relatively high rates of growth. In this process, "surplus labour" in rural economy means almost "unlimited" resource transfer to urban economies. High rates of profit in urban economy encourage capital accumulation and as capital accumulates, growth gains further momentum.

However, as countries approach "middle-income" level, the stimulating role of relatively easier growth driven by rural-to-urban labour force transfer and high rates of profit to capital investments diminishes; technologies get mature and then become obsolete. The profitability of capital investments shrinks and primitive capital accumulation based on the exploitation of labour force and of natural resources loses momentum. From this point on, growth has to be driven not by new capital investments but mainly through gains in productivity. Increasing productivity, in turn, requires education and research-development (R&G) investments in human capital and institutional reforms.

Economists stress that it is not so easy to overcome this bottleneck at middle-income level and call it *"middle-income trap."* Economic history suggests that apart from Europe as the pioneer of industrial revolution and its offspring like the US, Canada and Australia, only Japan and Korea as lately industrialized countries could manage to leave this trap behind.

Barry Eichengreen, Professor of Economics in the University of California, Berkeley and his colleagues[1] analyze *middle income trap* on the basis of three main criteria: (1) per capita income rising to 16,000 US$ (in 2005 fixed prices); (2) per capita income reaching to 58% of that of the US and (3) the share of manufacturing industry in total national income reaching 23 percent.

As far as Turkey is concerned, it is clear that the issue does not consist merely of setting a *quantitative* threshold and a simple quantification exercise on how this threshold is to be left behind. Before identifying alternative strategic elements of breaking through *Middle Income Trap,* it will be appropriate to consider the following concrete components of the problem: *Which thresholds and traps of which Turkey? With which technology and product patterns?*

It will be a correct choice to start with an examination of the regional distribution of economic activities in Turkey. In terms of Gross Regional Output as the basic measure of the size of the economy, while there were only 10 Level-2 regions exceeding the 10 billion $ threshold in 2004, there are 21 such regions in 2011. 5 out of these 21 regions have GRPs 50 billion $ and over. These regions, at the same time, have strong industrial output and they attract foreign investments. There are 16 regions with their GRPs in the interval 10-30 billion $ and 5 regions with GRPs less than 10 billion $. In terms of their GRPs, regions can be classified as developed (5 regions), developing (16 regions) and underdeveloped (5 regions). Under the impact of the global crisis, however, it appears that the rate of growth of Gross Regional Output has slowed down in the period 2008-2011. In spite of this, it should be regarded as a positive sign that all regions maintained their position in terms of GRO without any decline.

Drawing a line on a map of Turkey extending from Zonguldak to Hatay, 601 billion $ of national product amounting to 772.3 billion $ (78%) is accounted for by 12 regions to the west of this line covering 30 provinces. The remaining part of 171.3 billion $ is by 14 eastern Level-2 regions covering 51 provinces.

1 Eichengreen et al. (2011)

In 2011, four regions, namely TR10 (İstanbul), TR51 (Ankara) TR41 (Bursa, Eskişehir, Bilecik) and TR42 (Kocaeli, Sakarya, Bolu, Düzce, Yalova) contributed 376 billion $ to total national product.

To make it clearer, a size amounting to **376 billion $** is**:**

- about the total for Finland (194 billion $) and Hungary (196 billion $),
- larger than the total for Iraq (139 billion $) and Israel (237 billion $) and
- larger than that of Greece (294 billion $), Norway (266 billion $), Romania (267 billion $), Singapore (315 billion $) and Switzerland (354 billion $).

As another agglomeration area, the triangle TR31 (İzmir), TR33 (Manisa, Kütahya, Afyon, Uşak) and TR33 (Denizli, Aydın, Muğla) contributed **115 billion $** to national product in 2011. The third agglomeration with contribution exceeding 50 billion $' consists of Level-2 regions TR61 (Antalya, Isparta, Burdur), TR51 (Konya, Karaman) and TR62 (Adana, Mersin) with **79 billion $**.

We see the existence of three different "Turkeys" even in a classification based on this basic criterion. Growth performances of these "Turkeys" may be the subject of another investigation. Is the main hypothesis of the mainstream economic theory, which is known as "convergence", valid? In other words, can we say that the distance between the respective regions will be closed as a result of relatively high growth rates of underdeveloped regions while developed ones face progressively slower rates due to diminishing returns to capital?

The issue can be addressed not only in terms of regional income differences but also on the basis of *commodity patterns* of different "Turkeys". Which goods should be produced and exported? If the relative competitive advantage in international markets is disappearing as a result of more active participation of actors like China to the sector of textiles and garments, which Turkey's problem is this?

If the types of bank deposits are analyzed on the basis of data provided by the Union of Banks of Turkey, the case of Denizli, for example, shows that saving deposits had a share of 34.6% and commercial deposits had 3.4% (together 37.9%) in 1996. In 2002, these shares first increased to 36.3% and 5.1% (together 41.4%) in 2002 and then to 57.5% and 9.8% (together 67.3%), respectively, as of the end of 2011. This trend points out to the existence of SMSEs in Denizli which slowly withdraw from local textiles industry and prefer to maintain liquidity. As far as this specific sector is concerned, it is not too hasty to conclude that a similar situation exists in Bursa, Kocaeli and Adana. In Kahramanmaraş region, on the other hand, there is an impressive development in the very same sector. So, while it may be important for a region to support the development of a specific sector in terms of generating incomes and welfare, the same sector may face a dead-end in another region as a result of market dynamics. In sum, responses to such questions as "which commodity pattern" and "which Turkey" are extremely critical for SMSEs and regional development. As to the question "to which direction", it is directly related to the present stage of development in respective regions.

According to Rodrik and Imb (2007), there is significant positive correlation between the goods that countries export and their growth performances. The problematic of *"preferring right goods"* epitomized in the metaphor "*Potato chips or computer chips"* draws attention to the question by which commodity and technology patterns countries can improve their growth performances without falling into the *product trap.*

To sum it up, the problem of middle income trap is not only an issue related to a country's average income. It is a problem that requires awareness about differences between middle-high and middle-low income regions. In addition to regional income differences, the second dimension of the problem is related to the need to focus on producing and exporting "right" goods of advanced technology in order to avoid the *product trap.*

The purpose of this study is to discuss alternatives for Turkey's exit from the middle-income trap and strategies for sustainable development in the medium and longer term. Incorporating both analytical and empirical dimensions, the study is designed as two main stages. The present *First Volume* of the study addresses many dimensions of the issue including sources of growth, human resources, capacity for technology and innovation, foreign trade, transportation infrastructure and geographical externalities, and engages in analyses whether Turkey will be one of those countries escaping from the middle-income trap.

The second stage of the study (Volume II) aims at coming up with a growth model that will make it possible to keep track of the dynamics of the Turkish economy in medium/long term. The model will be constructed so as to dissect the sources of growth as human capital and information capital (R&D) accumulation. The main emphasis of model construction is based on the relationship of complementarity between public investment spending in education and other components of information capital on the one side and private sector driven information capital and R&D investments on the other. It aims at distinguishing individual growth dynamics of the Turkish economy.

This present report **"Turkey on her Way out of Middle-Income Trap: Which Turkey? Macro and Regional Analysis"** that constitutes the first part (Volume I) of the study is structured in nine chapters. The second chapter following the present one will address the conceptual framework of middle-income trap and the convergence hypothesis. Chapter Three will discuss the course of growth in Turkish economy while Chapter Four will take the issue in the context of product trap. Chapters five, six and seven will present region-based analyses and middle-income risk will be elaborated with respect to agglomeration economies, regional technology development and regional foreign trade. In Chapter Eight the relationship between human capital and income/efficiency will be established by addressing the "human" dimension of the issue. Finally, Chapter Nine will dwell on the economic outcomes of transportation infrastructure.

2. MIDDLE-INCOME TRAP

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2.1. Conceptual Framework and Theoretical Origins

It is a common knowledge after studies made since Solow that a growth model based solely on physical capital accumulation is not sustainable. This fact, known since Solow's work (1956), makes it clear that the most important obstacle to capital accumulation is diminishing rates of return to factors. To combat this outcome, therefore, we need a mechanism to generate non-diminishing returns to factor accumulation. Investments in education directly contribute to labour productivity and provide significant externalities for a sustainable growth. Indeed, the new literature on economic growth shows that there is direct and strong correlation between growth of national income and education, information (R&D) and spending in other social infrastructure. In addition to this, R&D activities carried out by public and private sectors lead to capital accumulation by improving knowledge base. So, economic growth is fed from two sources that mutually reinforce each other: Education and capital accumulation in R&D. Investments in education that will provide a qualified labour stock are indispensible in improving the productivity of labour. R&D activities by public and private sectors lead to capital accumulation by improving information and knowledge base. As two important sources of economic growth, education and R&D/innovation capacity will bring along externalities that will ensure higher productivity.

The theoretical origins of middle-income trap in fact confront us as a natural extension of the standard growth model of mainstream economic theory. It is based on the production function approach of the neo-classical mainstream economic paradigm. In this approach, if the total national income of a given country is taken as a single good Y, capital (K), labour (L) and level of technology as production factors determine the level of production through the production function:

$$Y = AK^{\alpha}L^{(1-\alpha)} \qquad (1)$$

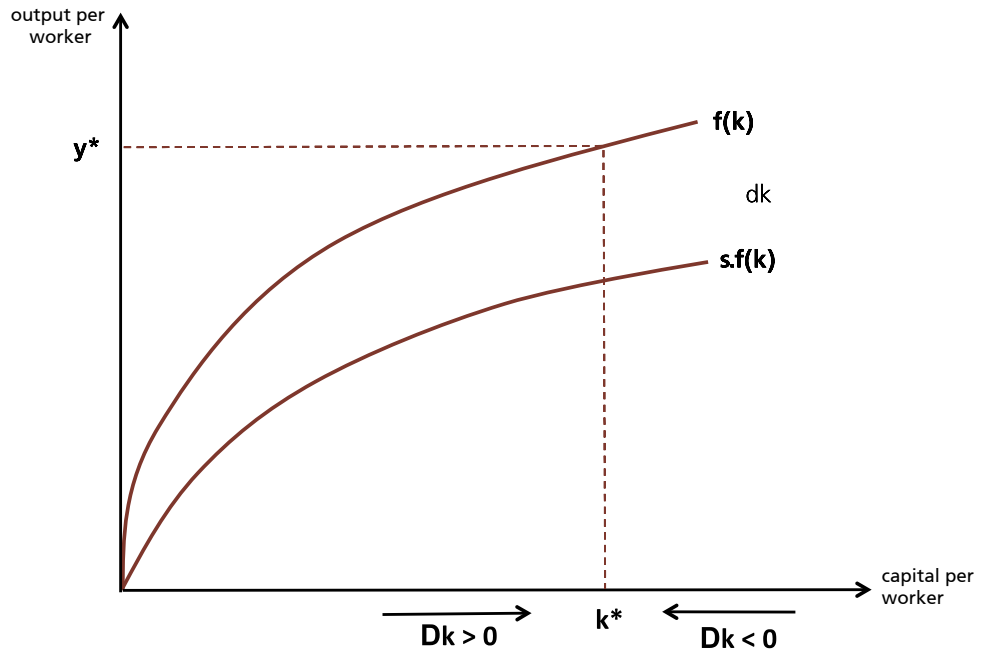
F (.,.,.) is determined as a continuous and derivable function. The neo-classical paradigm assumes that, in the production function, if capital input is increased while technology and labour inputs remain constant, the level of production rises, but eventually at diminishing rates. The assumption of diminishing returns to capital constitutes the main construction of the standard approach as the fundamental neo-classical feature of the production function.

The neo-classical paradigm develops another hypothesis at this stage: net price (rates of wage and profit) of a production factor is regarded as the ultimate net contribution of that factor to the process of production. In other words, when there is a unit increase in capital input, the net increase in the amount of produce is equal to the price of capital (i.e. rate of profit). It therefore establishes that the rate of profit is equal to the marginal product of capital. Expressed mathematically:

$$\frac{\partial F}{\partial K} = r \qquad (2)$$

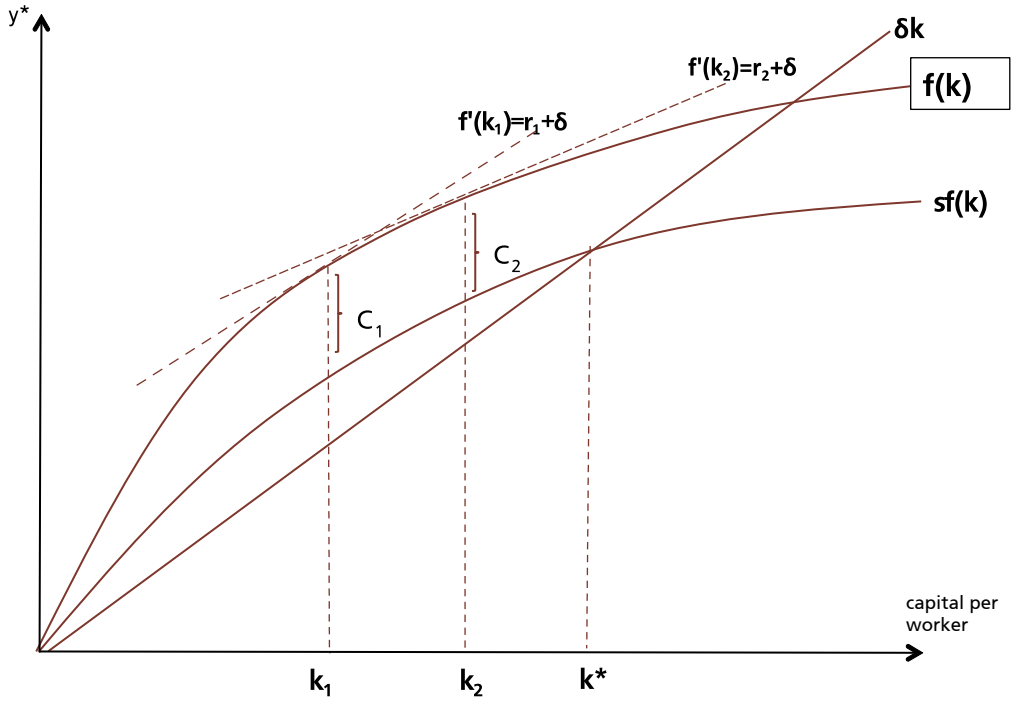
If the function F (.,.,.) can provide increases only at falling rates depending on capital input, the natural outcome of this hypothesis will be falling rate of profit in the long-term as a result of diminishing marginal product (of capital). In such a case, the level of per capita production rises at diminishing rates as capital input increases. Eventually, new capital investments remain only at a level that can compensate the depreciation of capital (dk). In other words, capital investments per worker turn out to be equal to capital depreciation. For a long time now, the mainstream economics call this point as growth equilibrium or static equilibrium. This model narrated in standard terms in textbooks is formulated as follows.

Figure 1: Long Run Equilibrium According to Conventional Economic Theory



In the figure, k* represents capital per worker and y*represents output per worker corresponding to the former in the long-term equilibrium. As shown in Figure 2, while reaching (k*, y*) equilibrium and rising to level k1 from level k2, marginal product of capital falls from level f'(k1) to level f'(k2) and ultimately the rate of profit falls too.

Figure 2: Transition to Long Run Equilibrium According to Economic Theory



The levels C1 and C2 in Figure 2 show amounts of per capita consumption after deducting from output amounts of savings and investment for capital.

The core message of the standard theory of growth is clear: capital investment in a given economy continues as long as the rate of profit is positive; yet, the rate of profit starts falling as a result of diminishing returns to capital and eventually it reaches to a point where capital investment can barely cover depreciation. The net rate of profit at that point is zero and from this point on there is no way of maintaining capital accumulation or enlarging production further (quantity y*).

The only means to break through and give a new momentum to growth is technological/institutional advance that is, increasing A. If we express it with the terminology of the present study, a model of production based solely on capital accumulation is eventually balanced off with zero growth. Describing this ultimate point as middle-income trap, getting out of it is possible not by further capital investment but only by R&D, education and institutional innovation, all pointing out to technological progress.

2.2. Convergence Hypothesis as an Extension of Middle-Income Trap

Eichengreen, Park and Sin (2011) describe middle-income trap as the threshold where per capita income reaches 16,000$. In addition to this, having per capita income at 58% of per capita income in the US as the hegemonic leader in the world, and the share of 23% for manufacturing industry in any given country are considered as other indicators of the trap.

Thus, middle-income trap thesis brings nothing new other than the reflection of theoretical construction of standard neo-classical growth model to current empirical literature. Nevertheless, it will still be profitable to examine the logical implications of this thesis since it brings along some suggestions with respect to current economic policies.

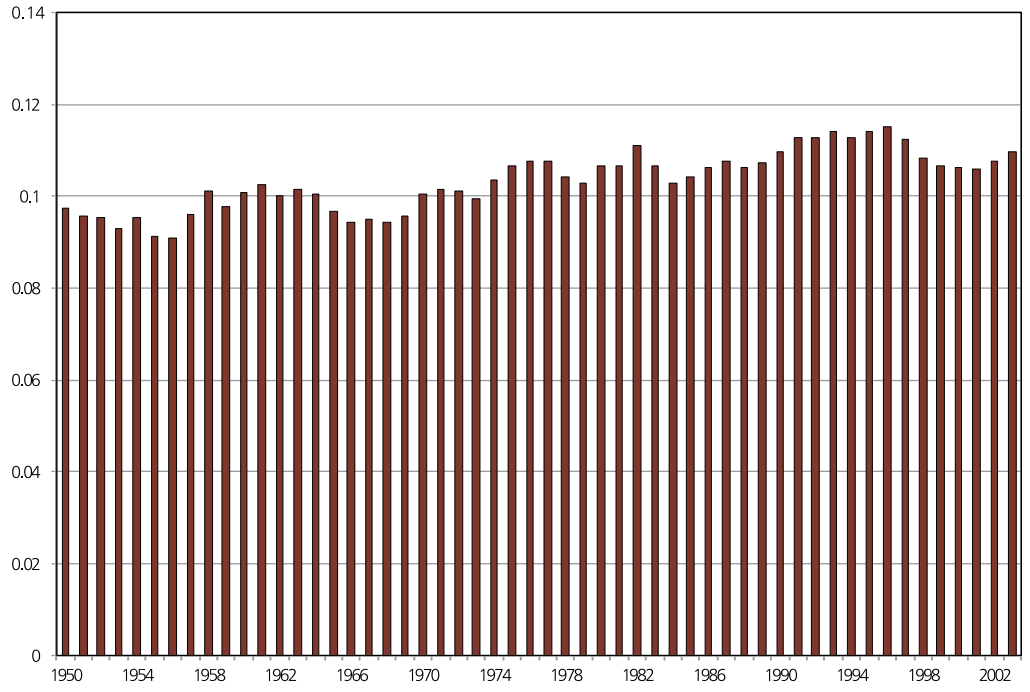
Within the theoretical framework we already have, starting with the neo-classical mechanism of diminishing returns to capital and after putting forward the hypothesis that differences in per capita income derive from differences in capital utilization, one can immediately see that countries with poor capital endowment (poor countries) will tend to accumulate capital and grow faster. In the course of time, however, and independently of their initial level of income, these countries too are destined to gradually falling rates of growth as they get closer to that point of long run equilibrium. Hence, the core message of the standard neo-classical theory is that per capita income differences among countries will get smaller and smaller and ultimately disappear.

To put it the other way, all countries will finally get caught in middle-income trap and converge unless they adapt technological progress. There is no doubt that these are interesting propositions in theoretical terms. But what is the empirical evidence? For instance, where does the convergence hypothesis stand in the face of empirical data related to the post-war period of world economies?

Inferences from available data do not provide a distinguishing trend. While there are some countries that confirm the "rule" and give the image of catching up with others, there are also other countries that strongly diverge from it. The fact that raw data do not confirm what has been said so far in terms of convergence is one of the leading issues that the literature on economic growth is busy in dealing with.

Figure-3 exhibits this argument more clearly. The figure focuses on the poorest 10% of countries in the world. According to the theory, these countries should have sufficiently high rates of return to capital and enjoy high rates of growth. The figure compares, for the second half of the 20th century, per capita incomes in the poorest 10% of countries with per capita GNP in the US. According to this figure, there is no trend of convergence in spite of growth and accumulation taking place for a period longer than half a century now.

Figure 3: Average Per Capita Income of the Poorest 10% Nations as a Ratio to USA



Source: IMF database

In order to move further, now let's take a look at a study by IMF's Africa Department on those converging and drifting further apart. Based on IMF's World Economic Outlook reports for the last 30 years, researchers led by Philippe Beaugrand conclude as follows: "For the period 1970-2000, taking a look at countries with strongest and poorest performance in terms of economic growth, it is hard to come up with some patterns." (Beaugrand et. al., 2004, page 6). Leaving aside those countries all experiencing sharp falls in their outputs in the 90s (reasons behind these falls remain out of the scope of the present study), the only market pattern that Beaugrand and his colleagues could find is "distancing away" rather than convergence. In Beaugrand's words:

"Data in Table 1 confirm the fact that efforts for growth waged by poor countries within the last thirty years have been futile. Leaving aside the dazzling cases of newly industrializing Asian countries, incomes increased in most rapidly developing countries while remaining stagnant in most "developing" countries. The fact does not change even after considering such factors as frequent outbreaks of conflict, incessant population growth and declining foreign aid. Poor ones have become poorer and rich ones have become even richer." (ibid, page 10).

Table 1: Per Capita Income Across the World, 1970 - 2000

	1970	1980	2000
Per capita income (2000 US Dollars			
Developed Countries	**11,001**	**16,323**	**26,843**
Developing Countries	**884**	**936**	**1,162**
Sub-Saharan Africa	**757**	**675**	**493**
Least Developed Countries	**410**	**366**	**306**
Relative per capita Income (%)			
Developed Countries	**100.0**	**100.0**	**100.0**
Developing Countries	**7.0**	**5.0**	**3.9**
Sub-Saharan Africa	**3.2**	**1.9**	**1.0**
Least Developed Countries	**4.4**	**2.5**	**1.0**

Source: Beaugrand, Philippe (2004). "And Schumpeter Said, "This is How Thou Shalt Grow, *IMF Working Paper,* March.

So, "middle income trap" is not a constraint valid for all countries...

2.3. Empirical Findings

The literature on middle-income trap has been enriched by new empirical studies along this line. Among these, a relatively new one is the contribution by Felipe, Abdon and Kumar (2012). In order to examine the concept of middle-income trap more closely, Felipe et. al. first discuss at which income thresholds this "trap" may emerge, and then how many years of delay in getting out of it can be considered as a problem.

Their methodology and findings can be summarized as follows: firstly, countries are divided into four groups on the basis of four income thresholds. In this grouping, countries with per capita income under 2,000$ according to 1990 Purchasing Power Parity (PPP) are considered as low income countries; per capita income in the range 2,000-7,250% as middle-low; 7,250-11,750 as middle-high and finally others with per capita income above 11,750$ as high-income countries.

According to this grouping, out of 124 countries examined 82 (66%) belong to the low income group, 33 (26.5%) to middle-low and 6 (5%) to middle-high income group while only three oil-rich countries (Kuwait, Qatar and United Arab Emirates) could find their places in high-income group. According to findings, America was in high-income group first in 1944 but later losing this status to regain it in 1962.

The number of low-income countries fell in the period 1950-1980 (35 countries in total). However, this process slowed down after 1980 and the number of poor countries remained unchanged as 48 in the period 1980-2000. 31 of these countries are in Sub-Saharan Africa and 5 in Asia. Table 1 show these countries that are still in poverty trap.

Table 2: Countries in Low-Income Trap, 1950 - 2010

Asia	Sub-Saharan Africa	Sub-Saharan Africa
Afghanistan (1,068)	**Chad (708)**	**Niger (516)**
Bengaldesh (1,250)	**Congo (259)**	**Nigeria (1,674)**
Lao (1,864)	**Eritrea (866)**	**Rwanda (1,085)**
Mongolia (1,015)	**Gambia (1,099)**	**Senegal (1,479)**
Nepal (1,219)	**Ghana (1,736)**	**Sierra Leone (707)**
Carrabian	**Ghine (607)**	**Sudan (1,612)**
Haiti (664)	**Kenya (1,115)**	**Tanzania (813)**
Sub-Saharan Africa	**Lesotho (1,987)**	**Togo (615)**
Angola (1,658)	**Liberia (806)**	**Uganda (1,059)**
Benin (1,387)	**Madagascar (654)**	**Zambia (921)**
Burkino Faso (1,110)	**Malawi (807)**	**Zimbabwe (900)**
Burundi (495)	**Mali (1,185)**	
Camerun (1,208)	**Mauritania (1,281)**	

Source: *Felipe, Abdon and Kumar (2012)*

These countries are referred to as "least developed" and described as "1 billion people at the bottom." It is widely known that the problem of countries in this group does not consist merely of getting capital accumulation process started; they have to overcome a range of socioeconomic challenges including conflicts, wars, famines and institutional weaknesses.

Meanwhile, as of the year 2010 methodological findings by Felipe and colleagues give the number of countries in respective groups as follows: 40 low-income; 38 middle-low income; 14 middle-high and 32 high income countries. Here, we can also find information on whether transition from one group to another, getting out of "poverty" or "middle-income trap" takes place slowly or fast in relative terms. Also taking due account of criteria by Eichengreen, Felipe and his colleagues give further information concerning how long it takes for the middle-income group to move to high income level, accompanied by rates of growth.

Table 3: Countries that were Low-Mid Income after 1950 and reached to Upper Mid-Income status				
Country	Year when Low-Mid Income status was reached	Year when Upper-Mid Income status was reached	Number of years spent in the Mid-Income status	Rate of per income growth over the transtion (%)
China	1992	2009	17	7.5
Malaysia	1969	1996	27	5.1
Korea	1969	1988	19	7.2
Taipei	1967	1986	19	7.0
Thailand	1976	2004	28	4.7
Bulgaria	1953	2006	53	2.5
TURKEY	1955	2005	50	2.6
Costa Rica	1952	2006	54	2.4
Oman	1968	2001	33	2.7

Source: *Felipe, Abdon and Kumar (2012)*

Table 3 shows these findings. It appears that while China remained in middle-low income level for 17 years, this period was longer than 50 years for Bulgaria and Turkey. Indeed, Turkey attained middle-low income level in 1955 and could reach middle-high level only in 2005, after 50 years. Turkey is one of the three countries (others are Bulgaria and Costa Rica) where the status of middle-income country lasted longest.

To complete the picture, Table 4 shows those countries that that could move from middle-high income threshold to high-income level. Here, besides some rather miraculous cases like South Korea (7 years), Japan (9 years) and Taipei (7 years) there are also others where the process took too long (Argentina: 40 years), Greece: 28 years).

Table 4: Countries that were Upper-Mid Income after 1950 and reached to High-Income status				
Country	Year when Upper-Mid Income status was reached	Year when Upper-Mid Income status was reached	Number of years spent in the Mid-Income status	Rate of per income growth over the transtion (%)
Japan	1976	1983	7	4.7
Korea	1988	1995	7	6.5
Singapur	1978	1988	10	5.1
Taypei	1986	1993	7	6.9
Austria	1964	1976	12	4.1
Belgium	1961	1973	12	4.4
Denmark	1953	1968	15	3.3
Finland	1964	1979	15	3.6
France	1960	1971	11	4.4
Germany	1960	1973	13	3.4
Greece	1972	2000	28	1.8
Ireland	1975	1990	15	3.2
Italy	1963	1978	15	3.4
Holland	1955	1970	15	3.3
Norway	1961	1975	14	3.5
Portugal	1978	1996	18	2.8
Spain	1973	1990	17	2.7
Argentina	1970	2010	40	1.2
Chile	1992	2005	13	3.7
Israel	1969	1986	17	2.6
Mauritus	1991	2003	12	4.0

Source: *Felipe, Abdon and Kumar (2012)*

In sum, in the path of low, middle and high income, some countries seem to have moved fast and others slow while there are also stagnant ones. Table 5 discusses the features of middle-income trap over the grouping introduced above. By referring to the Summers-Heston data set which is also the main data source of Felipe and others, the Table gathers word economies roughly in three groups: Rich countries, middle-income countries and poor countries.

Table 5: Sources of Growth Across Nations

	Per Capita Income (PPP $)	Growth of per Income Income (%)	Capital Accummulation (I/GDP)	Openness (X+M)/GDP
Rich Countries				
1950 - 1973	**10,957.21**	**3.6**	**24.1**	**37.8**
1974 - 1989	**18,595.53**	**2.1**	**23.6**	**54.2**
1990 - 1999	**23,808.84**	**1.8**	**22.8**	**69.6**
2000 - 2004	**28,080.89**	**1.8**	**23.6**	**85.4**
Mid-Income Countries				
1950 - 1973	**4,109.03**	**3.2**	**15.9**	**40.4**
1974 - 1989	**6,649.09**	**1.5**	**16.7**	**50.2**
1990 - 1999	**8,440.63**	**2.3**	**17.3**	**70.9**
2000 - 2004	**10,107.18**	**1.8**	**15.9**	**79.8**
Poor Countries				
1950 - 1973	**1,205.92**	**2.4**	**16.7**	**92.0**
1974 - 1989	**1,652.48**	**1.3**	**12.5**	**53.7**
1990 - 1999	**2,035.82**	**1.8**	**10.3**	**54.7**
2000 - 2004	**2,320.10**	**1.7**	**10.5**	**61.0**

Note: Under all periods, Rich refers to the highest 20% income group; Poor refers to the lowest 20% income group of countries. The rest refers to the Mid-Income countries
Source: Summer-Heston, Penn Tables, 2007

Average figures in the table introduce three distinct criteria assumed to have their effects on the level of development: the proportion of capital investments to national income (GDP) is very low in poor countries. Indeed, while this proportion is 23.4% in rich countries, it is 15.9% in middle-income countries and is as low as 10.5% in poor countries. Hence, low level of capital investments should be taken as a variable explaining poverty trap. Outward openness (proportion of exports plus imports to national income) too follows a similar ranking: 85.4%, 79.8% and 61% in 2000, for rich, middle-income and poor countries, respectively.

Then, middle or low-income trap is not an issue that can be boiled down merely to technology and resource utilization. It is a complex phenomenon having dimensions related to economic policy, trade and commodity patterns and institutional arrangements as well. Now we can examine the more detailed implications of this complex phenomenon in the case of Turkey.

3. GROWTH AND ITS SOURCES IN THE TURKISH ECONOMY

3. GROWTH AND ITS SOURCES IN THE TURKISH ECONOMY

3.1. Turkey's Growth Episode

Throughout the Republican era (1923-2011) Turkish economy enjoyed an annual rate of growth in real terms by 4.5%. The period as a whole can be divided roughly into three sub-periods. The first one is the period 1923-1960 including pre and post Second World War years; the second one is the period of planned development based on import substitution where domestic market was protected by import quotas (1961-1979) and the third one is the period of outward orientation and structural adjustment after 1980. The average rates of growth of national economy in these periods were, respectively, 4.6%, 5.2% and 4.2%.

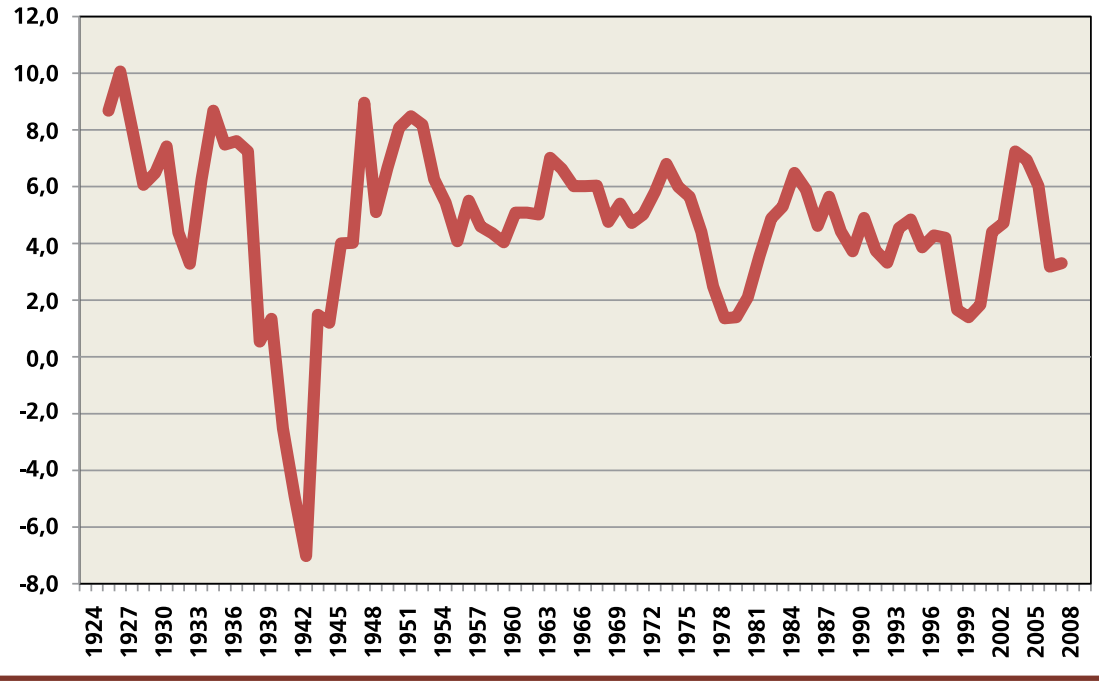
Table 6: Growth Rate of the Turkish Economy Across Periods, 1923 - 2012

Structural Features of the Period	Years Covered	Average Annual Growth, %
Overall Republic Period	**1923 - 2012**	**4.5**
1. WWH: Before and After	**1923 - 1960**	**4.6**
2. Planning and Import Substitution	**1961 - 1979**	**5.2**
3. Outward Orientation	**1980 - 2012**	**4.2**
3a. Ozal Years	**1980 - 1988**	**5.2**
3b. Financial Liberalization and Fiscal Deficits	**1989 - 1997**	**4.8**
3c. IMF Monitoring	**1998 - 2012**	**3.8**
3d. AKP Era	**2003 - 2012**	**4.8**

Table 6 shows the relevant data. It further divides the last period into four sub-periods as follows: Years with Özal in the period 1980-88 (5.2%); the periods of uncontrolled financial liberalization (1989-1997) and close IMF watch (1998-2012/3.8%) and the sub-period of the latter after 2003 (4.8%).

Figure 4 describes more clearly the 90 years-long fluctuating growth of Turkish economy. The figure presents annual real growth rates in five-year averages and "softens" these figures by following averages of annual fluctuations. The outcome is that Turkish economy has a falling growth trend along with a series of business cycles that followed the deep turbulences of the period 1926-1952. The increase in the rate of growth that followed the year 2002 was balanced off with the 2008 crisis and the overall slowdown in the rate of growth continued afterwards. Does it mean that Turkey is being drifted to stagnancy in general terms and still remains in middle-income trap?

Figure 4: Turkey: 5-Year Moving Average Growth (%)



Source: TUIK

We will seek answer to this question by investigating the real sources of growth in Turkish economy. This endeavour, in more technical terms "growth accounting approach" is based on considering as "technological advance" what remains after deducting the rates of growth in factors constituting economic growth.

Using the standard formula for the growth model above, we have:

$$Y = F(A, K, L) \qquad (2)$$

We see that national income Y can be dissected into three sources:

$$\frac{\dot{Y}}{Y} = F_A' \frac{\dot{A}}{A} + F_K' \frac{\dot{K}}{K} + F_L' \frac{\dot{L}}{L} \qquad (3)$$

Here, $F_x' = \frac{\partial F}{\partial x}(x = A, K, L)$ gives the marginal products of factors.

The equation no. (3) dissects the sources of economic growth into three:

1) Growth in total capital stock, g_K ,

2) Growth in labour supply, g_L

3) Technological advance g_A .

In the formulation above, growth in factor supplies as well as growth in output can be drawn from economic data; but there is no quantitative data on technological progress. However, taking the other way around is always possible: Given available data, the share of capital and labour can be found and using growth rates of K and L, we can infer from (3) that $g_A = g_Y - \alpha g_K - (1-\alpha) g_L$. In other words we can find the rate of progress in technology as "what remains left" (residually). This rate is generally called "Total Factor Productivity" and frequently is referred to as "Solow residual" since it is calculated by looking at what remains as residue. Still, since we know very little about this value it can also be seen as a "measure of our ignorance". So it measures not only our ignorance but also deviations from assumptions on which it is based

including single sector, full competition, full employment, fixed returns etc. Despite its serious theoretical weaknesses, TFP econometrics still managed to be a developing branch of empirical growth literature.

While examining the sources of private sector growth in the US in his path-breaking work, Solow (1957) benefited from the equation no. 3 and used a Cobb-Douglas type function for F (A, K, L).

$$Y = AK^{\alpha}L^{(1-\alpha)} \qquad (4)$$

The Cobb-Douglas production function given in (4) uses the assumption fixed returns to scale $(\alpha+(1-\alpha)=1)$ together with the assumption diminishing returns to capital $(\alpha<1)$. The coefficient (α) in the equation gives the national income share of capital.

$$\alpha = \frac{F_K' \cdot K}{Y}$$

Given these, the Cobb-Douglas type production function is a frequently used prototype in empirical growth literature. When we use the growth accounting equation (3) through the Cobb-Douglas function we obtain:

$$g_Y = g_A + \alpha g_K + (1-\alpha) g_L$$

From here, the contribution of technological progress to rate of growth can be obtained as a residue:

$$g_A = g_Y - \alpha g_K - (1-\alpha) g_K \qquad (5)$$

Growth accounting exercises of similar type are used for the Turkish economy by Saygılı, Cihan and Yurtoğlu (2005), Taymaz, Voyvoda and Yılmaz (2008), Altuğ, Filiztekin and Pamuk (2007), Filiztekin (2001) and Özmucur (1992).

As a part of the present study we will try to examine the growth characteristics of Turkish economy in the recent period (after 1980) on the basis of equation (5). Throughout this exercise, we will be using national income and labour force data from Economic and Social Indicators database of the Ministry of Development (SPO) by retrospectively adapting 1998 based series. The factor share of capital (α) will be assumed as 0.55 as suggested by Köse and Yeldan (1998) and Voyvoda and Yeldan (2001).

3.2. Total Factor Productivity Growth

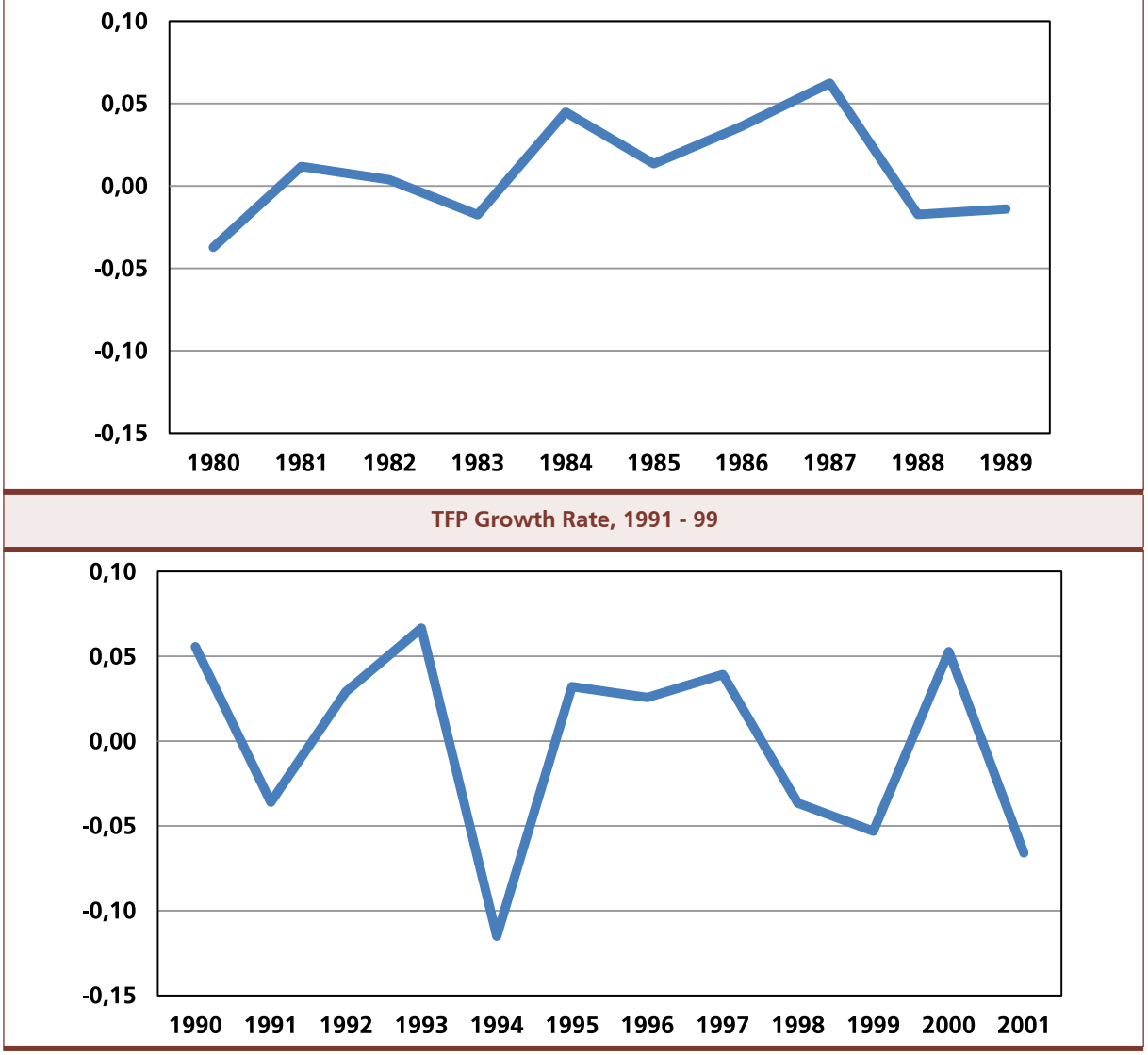
The most daunting data problem in empirical growth accounting is related to the calculation of capital stock. In this context, the most satisfactory work on determining capital stock in Turkey is by Saygılı et al. (2005) and Maraşlıoğlu and Tıktık (1991). These authors use the Perpetual Inventory Method (PIM) in determining capital stock. Under the PIM, capital investments are adjusted by net increases arising from capital's lifetime and depreciation to reach net capital stock. The most serious factor in determining capital stock is measuring the economic lifetime of investments. By adopting the approach of Saygılı et. al. the present study uses for all sectors with the exception of housing economic lifetime assumptions given by the OECD (1998- OECD sector averages) (See Table 7).

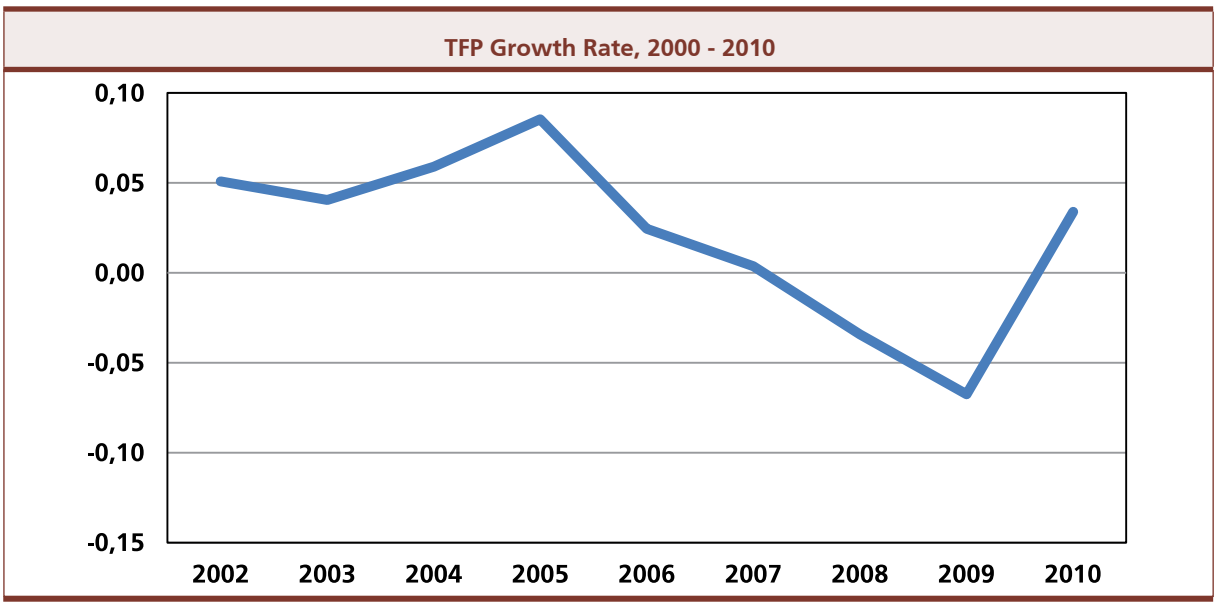
Table 7: Economic Lives of Investments Across Sectors	
	Investment Life (year)
Agriculture	23
Mining	23
Manufacturing	26
Energy	31
Transportation	25
Tourism	29
Housing	33
Education	29
Health	29
Other Services	26

Source: OECD (1998) and Saygılı, Cihan & Yurtoğlu (2005)

On the basis of equation (5) and growth accounting for Turkey, Total Factor Productivity (TFP) is obtained residually and the rates of growth in three decades following 1980 are given in Figure 5.

Figure 5: Total Factor Productivity





Source: Authors' calculations

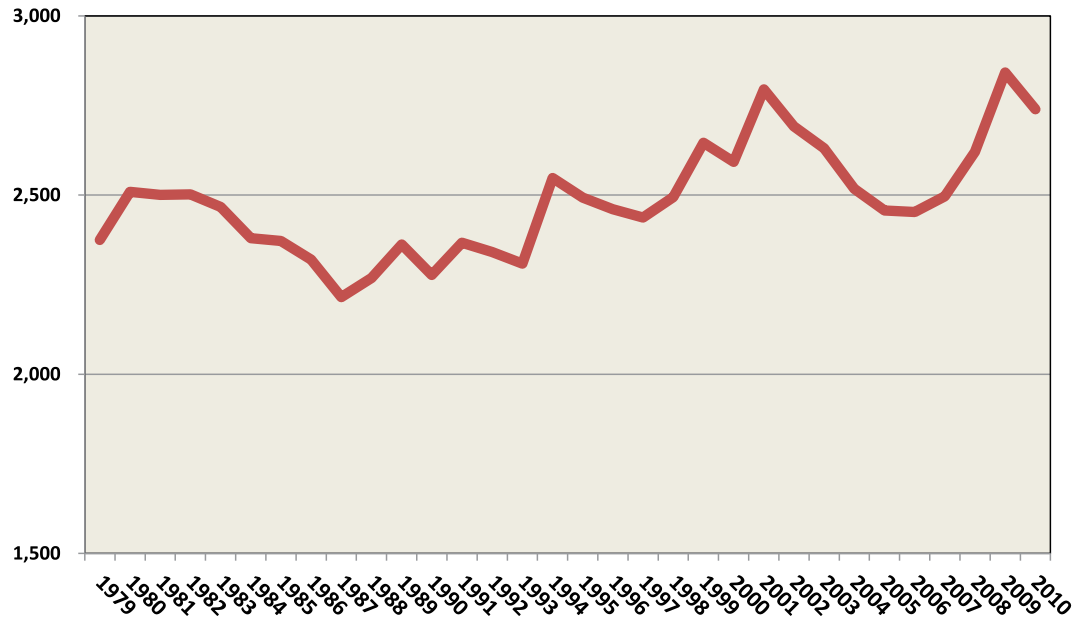
The TFP increases are more smoothly positive in the period 1980-89. In the period 1990-1999, however, it followed a fluctuating course and started falling after 2000. In the longer period of 1980-2010 too, the TFP index followed a similar course. If we take the level in 1980 as 100, the TFP displayed an accumulated rate of increase by 20% until 1990 and fluctuated widely in the 90s. Achievements of the early 2000s were lost after 2005 and TFP closed the first decade of the 2000s with an index value only 5 points above what it was in 1990 (See Figure 6).

Source: Authors' calculations

In spite of leaving behind the fluctuating trend of the 1990s, do our findings suggest the existence of a "productivity fatigue" in the 2000s? To discuss possible responses to this question we need to take a look at the development of production factors. Firstly if we trace the relative share of capital in output (capital output ratio) we observe that Turkey's capital utilization per unit of national income fell in the 80s (thus

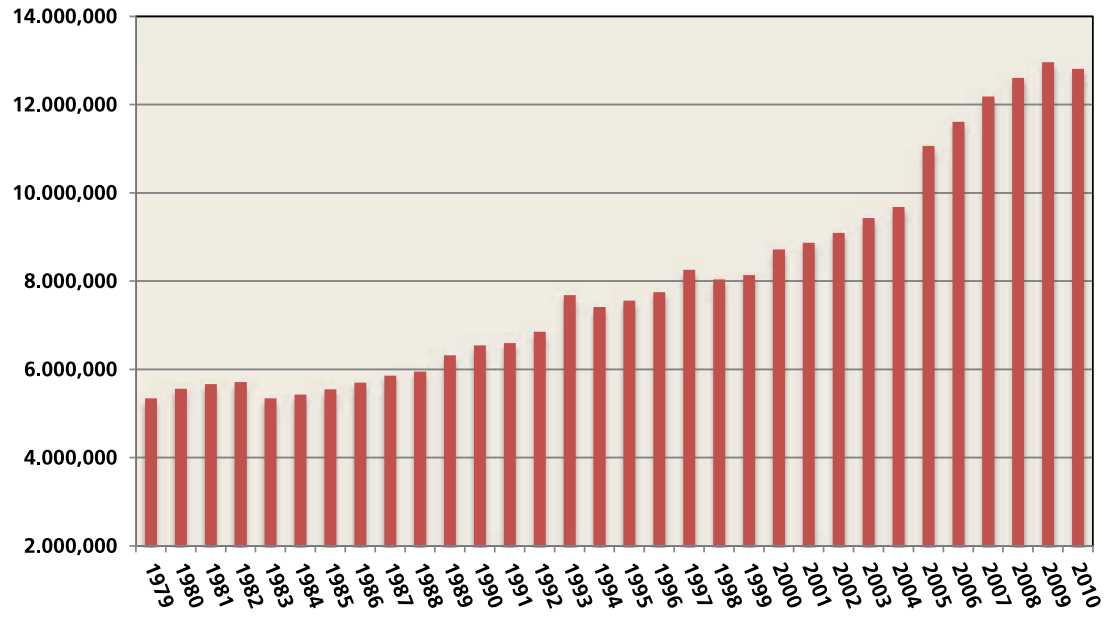
rising productivity of capital), but after 2005 there was a very striking increase in capital utilization. Figure 7 shows the increase in capital utilization. In Figure 8 we see that there is an increase in capital utilization per unit of labour (capital labour ratio) especially after 1993 and it gained further momentum in 2005 following a second inflection point. The capital labour ratio in 2010 is almost about 2.5 times of that in 1980 at fixed prices.

Figure 7: Capital - Output Ratio (K/Y) (1998 Fixed Prices, TL)



Source: Authors' calculations

Figure 8: Capital - Output Ratio (K/Y) (1998 Fixed Prices, TL)



Source: Authors' calculations

Excessively intensive utilization of capital factor in Turkish economy and relatively low productivity is a phenomenon that is generally accepted and frequently stressed in our empirical literature. The contribution of TFP to growth was in general terms at a significant level for a relatively short time period in the interval 1980-89. Over this period when the economy was in the process of restructuring, and trade and factor markets were consolidated was followed by an environment of fluctuations and uncertainties of the 90s under uncontrolled financial liberalization. The post-2005 growth pattern of Turkey was driven to excessively capital-intensive technologies as a result of large foreign trade deficit and possibilities of cheap importing.

3.3. Average Growth Rates and Contributions to Growth

With respect to their contributions to the growth path and for the period 1980-2010, we compute the share of capital investments as 58% and labour as 23%. Computed as a residue, the share of TFP is 18%. The contribution of capital to growth in the period 2000-2010 is 66.6%. Here, the share of Total Factor Productivity recedes to 20.2% and that of labour to 13.1%. We think that these findings are important in displaying not employment friendly and excessively capital-intensive characteristics of the period after 2000. Table 8 below outlines these findings.

Table 8: Average Rates of Growth and Decomposition of Its Sources, Turkey: 1980 - 2010

	Average Rate of Growth (%)				Decomposition of the Sources of Growth (%)		
	GDP	Capital	Labor	TFP	Capital	Labor	TFP
1980 - 1988	5.34	4.00	3.16	1.72	50.29	33.33	16.38
1990 - 1999	4.02	5.10	2.53	0.08	55.31	25.80	18.89
2000 - 2010	4.24	4.45	0.27	1.67	66.65	13.13	20.22
1980 - 2010	4.16	4.55	1.69	0.89	58.23	23.07	18.70

Source: Authors' calculations

Altuğ, Filiztekin and Pamuk (2006), on the other hand, assert that the main problem derives not from Turkey's excessively capital-intensive growth but from slow growth of capital stock in general. High volatility in Total Factor Productivity is regarded as a natural outcome of macroeconomic uncertainties and fluctuations. It is clear that for such an economy to overcome the "stagnancy" which is referred to as "middle-income trap" in macro sense, there is much need for technological and institutional momentums.

4. MIDDLE-INCOME TRAP: STRUCTURAL TRANSFORMATION, FOREIGN TRADE AND "PRODUCT TRAP"

4. MIDDLE-INCOME TRAP: STRUCTURAL TRANSFORMATION, FOREIGN TRADE AND "PRODUCT TRAP"[2]

As discussed in the early parts of the report, the length of the period of transition from lower to middle-income group may vary by countries. One can also speak of various factors (macroeconomic stability, structural conditions, quality of institutions etc) determining the duration of and exit from the middle-income group. It is nevertheless necessary to emphasize the critical nature of transition from activities of lower productivity to higher productivity. At this point, as capital accumulation on mature technologies can only make limited contribution to economic growth, questions such as gains in productivity, product spectrum and the way economy is integrated with worldwide networks and processes come to the fore.

Hence, structural transformation that an economy undergoes – what it produces and what it cannot and consequently what it exports and what it cannot- is critical. In this context, growth in per capita income emerges as an outcome of structural transformation beyond capital accumulation as the main determinant of transition from low to middle-income group. In this process of transformation, "goods" are produced on the basis on high productivity activities where income elasticity of demand is observed to be high. Rodrik (2011) stresses that an "automatically rising trend" emerges for those countries that join the networks/ processes of producing this group of goods.

In their works, Hidalgo and Hausmann (2009), Hausmann et. Al (2007) and Hidalgo et. al. (2007) underline the importance of product diversity and more productive activities rather than more and more efficient production of the same group of goods in proceeding to a higher income group along with economic growth. In this part of the study, we examine the foreign trade performance of the Turkish economy and, parallel to this, the nature of structural transformation[3].

Beginning 80s when the Turkish economy started to integrate with global goods and services markets, the change in the volume of foreign trade which displayed insignificant increases at early periods later gained momentum in the 90s and particularly in the 2000s. In the process, the export pattern of the 70s largely consisting of agricultural goods, shifted to textiles and garments in the 80s. These sectors maintained their weight until the mid-90s as the main force driving Turkey's integration with other economies in the world. Starting from the 2000s, machinery, automotive and electronic devices have been goods whose shares in total exports rose significantly.

The export pattern of Turkey which, in the 70s consisted mainly of agricultural products, then moving to traditional labour-intensive sectors in the 80s and shifting to sectors with "middle-low" and "middle-high" technology in the 90s, also reflects transformations that productive sectors of the economy underwent. In this respect, examining how Turkish economy is integrated with world production networks and determining its "relative" position will be illuminating in response to the question of "product trap" associated with middle-income trap. For example, in case of products that display comparative advantage and specialization in foreign trade with a low productivity/low value added content, may cause the economy to stagnate or fall behind.

The examination with respect to production processes of foreign trade relations associated with manufacturing industry which accounts for about 95% of Turkey's total exports is important and critical

2 This heading is partly based on Chapter 3 of Taymaz, Voyvoda and Yılmaz (2011).
3 Since Input-Output Tables published for the Turkish economy do not allow any analysis for the 2000s, the evaluation in this part is based on foreign trade variables.

both for grasping the nature of structural transformation in the economy and for developing policies to avoid middle income trap.

4.1. Overall State of Foreign Trade Balances in Turkey[4]

Tables 9 and 10 show, for the period 1996-2011, total export and import values under BEC and shares of investment, intermediate and consumption goods in these totals. According to the table, total exports of Turkey which amounted to 23.2 billion $ at current dollar rate in the year 1996 increased in this period by annual average of 16.1% and reached 132 billion $ in 2008, to recede back to 102.1 billion % in 2009. As of the end of 2011, total exports of Turkey amounted to 134.9 billion $. Turkey's imports, on the other hand, totalling to 43.6 billion $ in 1996 increased by 15.3% a year and rose to 202 billion $ in 2008, then drastically falling to 141 billion $ in 2009.

Table 9: Foreign Trade Classified by Broad Economic Categories - Exports, 2000 - 2011

	1996	1998	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
TOTAL (Million Dolars)	23.224	26.974	27.775	31.334	36.059	47.253	63.167	73.476	85.535	107.272	132.027	102.143	113.883	134.907
Capital Goods (%)	4,82	4,98	7,83	8,48	7,74	9,19	10,34	10,88	11,02	12,82	12,67	10,88	10,34	10,52
Capital goods (Except transportations vehicles)	2,91	3,20	3,67	3,89	3,71	4,11	4,36	4,64	4,77	5,22	5,21	5,70	5,63	5,74
Transportation vehicles incidental to industry	1,91	1,77	4,16	4,59	4,03	5,08	5,98	6,25	6,24	7,60	7,45	5,19	4,70	4,78
Intermediate Goods (%)	42,06	41,71	41,64	42,66	40,65	39,14	41,07	41,22	44,18	46,05	51,30	48,69	49,51	50,36
Unprocessed materials incidental to industry	5,28	4,28	3,61	3,00	2,63	2,54	2,34	2,33	2,65	2,61	2,43	2,58	3,22	2,99
Processed materials incidental to industry	28,88	27,86	28,98	30,30	29,05	27,26	29,54	28,14	30,05	30,48	35,74	34,43	33,73	33,89
Unprocessed fuels and oils	0,00	0,01	0,02	0,02	0,01	0,01	0,00	0,02	0,00	0,01	0,06	0,10	0,09	0,10
Parts of investment goods	1,65	2,09	2,07	2,08	2,02	2,06	2,15	2,36	2,61	2,95	2,81	2,86	3,03	3,29
Parts of transportation vehicles	2,94	3,96	4,35	4,97	4,99	5,19	4,90	5,08	5,33	5,74	5,26	4,85	5,56	5,92
Unprocessed materials of food and beverages	0,65	1,41	0,93	0,78	0,39	0,25	0,12	0,25	0,33	0,17	0,10	0,25	0,39	0,15
Processed materials of food and beverages	1,69	1,34	0,89	0,65	0,66	0,74	0,75	1,00	0,76	0,79	1,00	1,12	1,02	1,36
Processed fuels and oils	0,95	0,77	0,78	0,87	0,90	1,09	1,27	2,05	2,43	3,29	3,90	2,50	2,46	2,67
Consumption Goods (%)	53,04	53,26	50,36	48,71	51,21	51,06	48,29	47,41	44,18	40,73	35,66	39,88	39,80	38,71
Automobiles	1,16	0,52	2,26	3,10	3,60	4,65	6,23	5,95	6,60	6,38	5,66	5,96	5,45	4,81
Durable consumption goods	4,10	6,37	7,40	7,01	9,08	9,21	9,50	9,40	8,87	7,98	6,78	7,69	7,83	7,76
Semi-durable consumption goods	23,35	23,15	20,65	19,01	20,01	18,71	15,57	14,03	12,28	11,60	9,48	10,43	10,36	9,69
Non-durable consumption goods	9,74	10,59	10,51	9,13	9,44	9,33	8,22	7,94	7,23	6,37	5,40	6,22	6,28	5,84
Unprocessed of food and beverages	7,28	6,70	4,91	5,30	4,57	4,30	4,08	4,41	3,85	3,55	3,20	4,30	4,36	4,09
Processed of food and beverages	7,09	5,65	4,16	4,52	3,40	3,76	3,57	3,99	3,47	3,25	3,19	3,80	3,96	4,37
Gasoline	0,22	0,18	0,35	0,50	0,99	0,95	0,98	1,49	1,66	1,45	1,71	1,21	1,33	1,94
Transportation vehicles not incidental to industry	0,09	0,10	0,10	0,14	0,12	0,14	0,15	0,20	0,22	0,16	0,24	0,27	0,22	0,22
Others	0,08	0,06	0,17	0,15	0,41	0,61	0,30	0,48	0,62	0,39	0,37	0,55	0,36	0,41

4 In this part and others to follow, the basic approach adopted is based on gathering foreign trade data within the framework of vertical disaggregation of production processes. It is considered that a good starting point to grasp the dynamics of structural transformation in foreign trade is to gather foreign trade data according to the United Nations UN Broad Economic Categorization (BEC). In disaggregating foreign trade with respect to production processes in the present study, the TÜİK data provided in terms of BEC and detailed versions of this categorization are used. When production processes are detailed on the basis of UN-BEC categories, foreign trade data can be gathered under five categories: i) basic goods, ii) intermediate/semi-finished goods, iii) intermediate goods –parts and components, iv) final consumption goods and v) final capital goods. BEC related definitions are given in the Annex.

Table 10: Foreign Trade Classified by Broad Economic Categories - Imports, 2000 - 2011														
	1996	1998	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
TOTAL (Million Dolars)	43.627	45.921	54.503	41.399	51.554	69.340	97.540	116.774	139.577	170.063	201.964	140.928	185.544	240.842
Capital Goods (%)	23,50	23,21	20,85	16,76	16,29	16,33	17,84	17,44	16,73	15,91	13,87	15,23	15,53	15,48
Capital goods (Except transportations vehicles)	19,14	19,45	17,00	14,21	14,69	14,17	13,83	14,66	14,07	13,74	11,51	13,05	12,53	12,29
Transportation vehicles incidental to industry	4,36	3,77	3,86	2,56	1,61	2,17	4,00	2,78	2,64	2,17	2,36	2,18	3,00	3,18
Intermediate Goods (%)	66,73	65,13	66,07	73,19	73,04	71,73	69,25	70,11	71,36	72,70	75,14	70,61	70,84	71,89
Unprocessed materials incidental to industry	7,35	6,36	5,11	4,92	5,73	6,19	5,92	5,16	5,24	5,90	6,78	5,67	6,61	6,71
Processed materials incidental to industry	31,60	32,61	29,54	33,54	34,98	34,76	34,25	33,87	33,30	34,63	32,52	30,86	31,65	31,34
Unprocessed fuels and oils	10,37	5,57	8,87	10,10	9,62	8,25	7,51	12,59	14,17	13,42	15,97	12,61	0,63	0,54
Parts of investment goods	6,68	8,06	7,24	7,64	8,09	6,98	6,59	5,78	5,46	5,34	4,68	5,88	4,89	4,51
Parts of transportation vehicles	4,86	6,23	5,80	5,96	5,24	5,69	6,71	6,36	6,22	6,15	5,58	5,56	5,70	5,12
Unprocessed materials of food and beverages	2,11	1,49	0,95	0,73	1,03	1,38	0,97	0,74	0,56	0,99	1,56	1,47	1,51	1,82
Processed materials of food and beverages	1,06	1,00	0,61	0,72	0,78	0,76	0,64	0,65	0,68	0,50	0,86	0,86	0,60	0,74
Processed fuels and oils	2,70	3,80	7,96	9,59	7,58	7,72	6,66	4,96	5,70	5,76	7,18	7,70	6,59	6,82
Consumption Goods (%)	9,22	10,90	12,71	9,21	9,50	11,27	12,41	11,97	11,55	10,99	10,64	13,69	13,33	12,33
Automobiles	2,34	3,03	4,76	1,42	1,58	3,20	4,32	3,68	3,06	2,79	2,25	3,03	3,68	3,52
Durable consumption goods	1,42	1,97	2,07	1,53	1,33	1,32	1,48	1,57	1,64	1,78	1,75	1,86	1,89	1,80
Semi-durable consumption goods	1,75	1,98	1,71	1,75	1,69	1,82	1,96	2,15	2,33	2,30	2,38	2,90	2,86	2,68
Non-durable consumption goods	1,68	2,23	2,51	3,18	3,37	3,40	3,26	2,92	2,67	2,56	2,62	3,51	2,98	2,45
Unprocessed of food and beverages	0,21	0,35	0,33	0,28	0,25	0,17	0,15	0,23	0,23	0,24	0,37	0,42	0,36	0,34
Processed of food and beverages	1,30	0,75	0,58	0,58	0,58	0,58	0,54	0,55	0,54	0,56	0,56	0,71	0,74	0,75
Gasoline	0,40	0,42	0,63	0,40	0,64	0,71	0,57	0,61	0,78	0,69	0,65	0,84	0,72	0,69
Transportation vehicles not incidental to industry	0,13	0,16	0,12	0,09	0,07	0,06	0,12	0,25	0,29	0,07	0,06	0,41	0,11	0,10
Others	0,55	0,76	0,37	0,83	1,16	0,67	0,51	0,49	0,36	0,40	0,35	0,47	0,29	0,31

As a general observation it can be said that increases in both exports and imports gained momentum after 2000. In the period 2002-2008 average annual increase in exports was 23%, while imports increased by 25.7%. It is possible to trace the devastating effects of the global turbulence of 2008-2009 on Turkey's real economy. Turkey's total exports increased by 25.4% in 2007 before first dropping to 23.1% in 2008 and then to 22.6% in 2009. The rates of increase in total imports were 21.8% and 18.8%, respectively for 2007 and 2008. For the year 2009, along with a drastic contraction of production, imports decreased by 30.2%. After the period of global turbulence, imports increased by 31.7% and 29.8% in 2010 and 2011, reaching 240.8 billion $ at the end of 2011. In the same period, average annual increase in exports is by 11.5% and 18.5%.

Total foreign trade data are given in Tables 9, 10 and 11 with their items according to BEC and in more detailed form (as disaggregated vertically). It is possible to observe from these tables the main features of the change in Turkish economy in the context of international division of labour and trade. It tells that Turkish economy has its foreign trade component that basically imports intermediary and capital (investment) goods and exports intermediate and consumption goods. In the period 1996-2011, shares of capital, intermediate and consumption goods in total exports are, respectively, 9.5%, 44.3% and 45.8%. The striking point here is that the share of consumption goods in total exports has been steadily falling since 1996: while the share of consumption goods in total exports of the country was 53% in 1996, it fell to 38.7% as of 2011. The shrinking share of consumption goods in total exports is particularly salient after 2004.

Table 11: Foreign Trade by Stages of Production: Shares and Contribution to Trade Balance - Turkey, 1995 - 2009

EXPORT SHARES					
		Intermediate Goods		Final Goods	
	Primary Goods	Intermediate goods-semi finished	Intermediate goods-parts and components	Final capital goods	Final consumption goods
1995	4,96	32,30	0,96	3,94	54,84
1998	5,30	29,99	5,87	5,19	53,65
1999	5,35	29,88	5,97	6,86	51,94
2000	4,24	30,65	6,54	7,83	50,74
2001	3,54	32,07	7,12	8,57	48,70
2002	2,85	31,28	7,11	7,85	50,90
2003	2,66	29,81	7,36	9,33	50,84
2004	2,35	32,18	7,13	10,46	47,87
2005	2,48	32,49	7,43	11,04	46,57
2006	2,88	34,72	8,07	11,18	43,16
2007	2,69	35,83	8,64	12,83	40,01
2008	2,48	42,25	8,13	12,74	34,40
2009	2,87	39,09	7,78	11,00	39,25
IMPORT SHARES					
		Intermediate Goods		Final Goods	
	Primary Goods	Intermediate goods-semi finished	Intermediate goods-parts and components	Final capital goods	Final consumption goods
1995	20,66	39,77	10,34	22,83	6,40
1998	13,79	36,93	14,58	23,94	10,76
1999	15,61	37,58	14,02	21,59	11,19
2000	15,63	36,46	13,56	21,73	12,62
2001	16,81	41,36	14,52	17,90	9,41
2002	17,29	42,03	14,08	17,22	9,37
2003	16,68	41,59	13,36	17,23	11,14
2004	15,01	40,21	13,86	18,58	12,33
2005	15,53	41,24	12,80	18,41	12,02
2006	15,96	42,05	12,53	17,92	11,54
2007	16,40	43,40	12,03	16,96	11,21
2008	19,30	43,64	10,98	15,08	11,00
2009	15,02	42,30	12,15	16,46	14,07
CONTRIBUTION TO TRADE BALANCE					
		Intermediate Goods		Final Goods	
	Primary Goods	Intermediate goods-semi finished	Intermediate goods-parts and components	Final capital goods	Final consumption goods
1995	-7,38	-3,51	-3,00	-8,88	22,76
1998	-3,98	-3,25	-4,07	-8,77	20,07
1999	-4,91	-3,69	-3,85	-7,05	19,50
2000	-5,14	-2,62	-3,16	-6,27	17,19
2001	-6,56	-4,59	-3,65	-4,61	19,40
2002	-7,04	-5,24	-3,40	-4,57	20,24
2003	-6,81	-5,72	-2,91	-3,84	19,27
2004	-6,08	-3,85	-3,23	-3,90	17,06
2005	-6,25	-4,19	-2,57	-3,53	16,53
2006	-6,24	-3,50	-2,13	-3,22	15,08
2007	-6,58	-3,63	-1,63	-1,98	13,82
2008	-8,16	-0,67	-1,38	-1,13	11,35
2009	-5,98	-1,58	-2,15	-2,69	12,39

Source: Taymaz, Voyvoda and Yılmaz (2008)

In the period 1996-2011, shares of capital, intermediate and consumption goods in total imports are, respectively, 17.5%, 70.6% and 11.4%. In this period, there is steadily decrease in the share of capital goods in total imports while there is a steady increase in the shares of intermediary and consumption goods. If we consider this together with the increasing share of intermediate goods in total exports, we can say that there may have been shifts in the composition of foreign trade, and in that of value added.

According to Table 11, increases in the shares of capital and intermediate in total exports in the period 1995-2009 which go parallel to falling share of consumption goods in total exports stem basically from increases in exports of final capital goods and intermediary goods, particularly semi-finished products. Of the item intermediate goods whose share in total imports was over 70% throughout 2000s, 60% consist of semi-finished goods and semi-finished goods are mainly composed of raw materials processed for industries and unprocessed fuels and oils. These increases observed in the period in question for both exports and imports of semi-finished goods, particularly those processed for industries seem to be critical in the context of frequent debates on "import-dependence of exports and production" in the given mode of technologies".

For the period 1995-2009, we observe significant increases in the shares of intermediate goods as parts and components, semi-finished goods and final capital goods in total exports accompanied by significant falls in the share of final consumption goods. In spite of this, the category of final consumption goods was the only one that contributed positively to trade balance consistently. This observation suggests that, in spite of shifts taking place in export and import shares in the 1990s and 2000s, the composition of production as well as the share of imported components of exports largely remain as they have been.

4.2. Competition and Structural Transformation in Turkey with Respect to Production Processes

The international trade theory identifies the "specialization" of economies within the framework of international division of labour through "revealed comparative advantage" indicators. According to this approach, for example, the countries of Far East that enjoyed significant economic growth in the 1980s and 1990s had their integration to the global economy firstly through such labour-intensive and resource-based sectors as textiles and footwear. This integration later continued with rather high technology goods in the sectors of electronics and telecommunication. Thus, "comparative advantage" indicators should be expected to reflect this structural change in processes of production and foreign trade performance. Nevertheless, just like there may be sector-based shifts in production and foreign trade processes as in the example above, there may also be simultaneous shifts in different stages of production in respective sectors or, within the same sector classification, goods exported by different economies may correspond to entirely different processes of production in technological terms.

Thus, under the approach to the vertical disaggregation of different stages of production used in the study, each stage in production process is represented by a different production function. Consequently, it is possible to speak about "comparative advantage in foreign trade" all stages in a given economy, and also about "comparative advantage" or "comparative disadvantage" in trade at different stages. An economy that has "absolute advantage in trade" in almost all production processes involved means horizontal specialization and intensive production of value added. On the other hand, in economies which have advantage in some of the vertical processes of production while disadvantage in others, one can speak about shortage in industrial base or larger share of the imported component of exports or cut off backward linkages of local industry.

Hence, importation of intermediate goods, for example, is important since it may indicate interruption in the vertical flow of local production processes which is commonly referred to as "assembly industry". An observation on development paths of world economies suggests that late-comers specialize in labour-intensive final stages of production processes, while advanced economies have enjoyed contribution to positive trade balance at earlier capital and technology-intensive stages (Lemoire and Ünal-Kesenci, 2004).

Table 12: Contribution to Trade Balance by Sector and by Stages of Production, Turkey, 1998 - 2009

Low Technology		Sectors, ISIC, Rev. 3							
		15	16	17	18	20	21	22	36
		Food products & beverages	Tobacco products	Textiles	Wearing apparel	Products of wood and cork	Paper & paper products	Printing & publishing	Furniture
Primary goods	1998	-0,49		-0,02		0,00			0,03
	2002	-0,61		-0,01		0,00			0,02
	2009	-0,15		0,00		-0,06			0,00
Intermediate goods-semi finished	1998	-0,46		2,77	-0,04	-0,04	-0,75	0,00	-0,09
	2002	-0,60		1,35	-0,14	0,00	-0,77	-0,02	-0,12
	2009	-0,69		0,79	-0,01	-0,04	-0,91	-0,02	-0,09
Intermediate goods-parts and components	1998			-0,02				-0,01	0,03
	2002			-0,02				0,00	0,06
	2009			-0,02				-0,01	0,03
Final capital goods	1998								-0,01
	2002								0,08
	2009								0,09
Final consumption goods	1998	0,35	0,08	7,89	9,88	-0,01	0,04	-0,07	0,24
	2002	0,16	0,11	6,99	8,18	-0,01	0,13	-0,14	0,84
	2009	0,18	0,09	3,39	3,08	-0,01	0,22	-0,01	0,59
All Stages (2009)		-0,66	0,09	4,18	3,07	-0,11	-0,69	-0,02	0,59

Table 13: Contribution to Trade Balance by Sector and by Stages of Production, Turkey, 1998 - 2009

Medium-Low Technology		Sectors, ISIC, Rev. 3					
		23	24	25	26	27	28
		Coke, petrolium products	Chemicals and chemical products	Rubber and plastic products	Other non-metallic minerals	Manufacture of basic metals	Manufacture of fabricated metal product (exc machinery)
Primary goods	1998	-0,73	-0,05	0,00	0,00	0,00	
	2002	-0,99	-0,05	0,00	0,00	0,00	
	2009	-0,80	-0,05	0,00	0,00	0,00	
Intermediate goods-semi finished	1998	-0,06	-6,25	0,03	1,09	-0,30	0,25
	2002	-0,07	-7,61	0,02	1,52	-1,56	0,33
	2009	-0,10	-7,42	0,47	1,29	5,75	0,97
Intermediate goods-parts and components	1998			0,32	-0,02		-0,12
	2002			0,35	-0,01		-0,35
	2009			0,16	-0,01		-0,27
Final capital goods	1998						0,08
	2002						0,06
	2009						0,31
Final consumption goods	1998		0,09	-0,04	0,40		0,10
	2002		-1,08	0,03	0,37		0,14
	2009		-1,26	0,16	0,16		0,03
All Stages (2009)		-0,90	-8,73	0,63	1,46	5,75	1,31

Table 14: Contribution to Trade Balance by Sector and by Stages of Production, Turkey, 1998 - 2009

Medium-High Technology		Sectors, ISIC, Rev. 3			
		29	31	34	35
		Manufacture of machinery and equipment	Electrical machinery and apparatus	Motor vehicles and trailers	Other transport
Primary goods	1998				
	2002				
Intermediate goods-semi finished	1998	-0,03	0,61		
	2002	0,00	0,65		
	2009	-0,03	0,13		
Intermediate goods-parts and components	1998	-1,47	-0,52	-0,84	-0,26
	2002	-1,38	-0,62	-0,27	-0,21
	2009	-1,01	-0,47	-1,15	-0,03
Final capital goods	1998	-5,49	-0,35	-0,58	-0,42
	2002	-4,57	-0,39	1,37	0,01
	2009	-2,25	-1,10	1,52	-0,21
Final consumption goods	1998	0,29	-0,02	-1,38	-0,02
	2002	1,05	-0,05	1,10	0,03
	2009	1,34	-0,05	1,13	-0,14
All Stages (2009)		-0,94	-1,02	2,66	-0,35

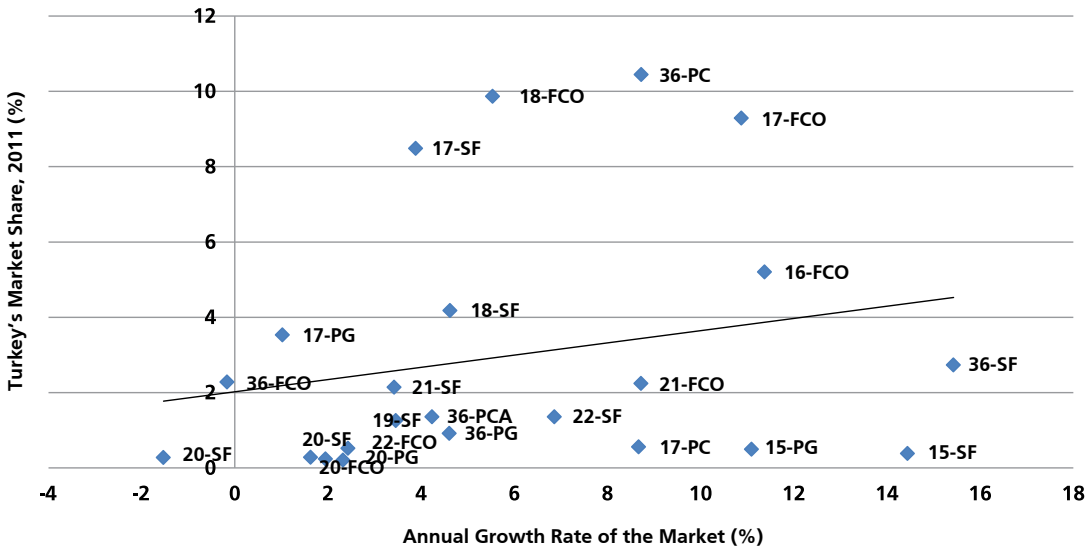
Table 15: Contribution to Trade Balance by Sector and by Stages of Production, Turkey, 1998 - 2009

HighTechnology		Sectors, ISIC, Rev. 3		
		30	32	33
		Office, accounting and computing machinery	Communica-tion and apparatus	Medical, precision and optical instruments
Primary goods	1998			
	2002			
	2009			
Intermediate goods-semi finished	1998			-0,05
	2002			-0,05
	2009			-0,06
Intermediate goods-parts and components	1998			
	2002	-0,45	-1,76	-0,11
	2009	-0,22	-0,30	-0,06
Final capital goods	1998	-0,94	-1,47	-1,01
	2002	-0,95	-1,02	-0,94
	2007	-0,88	-1,17	-0,87
	2009	-1,04	-1,07	-1,01
Final consumption goods	1998	-0,01	1,50	-0,20
	2002	0,00	2,28	-0,23
	2009	0,00	0,67	-0,25
All Stages (2009)		-1,04	-0,40	-1,31

With the method of vertical disaggregation of production processes used in the present study, tracing the foreign trade contribution indicator temporally in general and then at sector level is important in giving hints about the position of Turkish economy within the global division of labour and on its own development path. It is possible to analyze with the help of Tables 12-15 whether manufacturing industry sectors have undergone structural transformation parallel to the overall economy with respect to production processes and within the framework of global division of labour. These tables display the indicator of contribution to trade balance for selected world economies and Turkey in five vertical disaggregation categories for different levels of technological production.[5] Given total production processes, sectors and stages with positive contribution to trade balance are shaded in the Tables 12-15. In these tables, the change in date of the contribution for each sector can be taken as an indicator whether there has been any change in the production technology of the sector concerned.

For complementing the analysis in this chapter, Tables 8 -10 above are prepared to compare foreign trade advantages of different economies at in different processes of production and to determine the relative position of Turkey. Here, the revealed comparative advantage - RCA developed by Lederman, Olarreaga and Rubiano (2008) is employed.[6] For selected sectors at different technology levels under the manufacturing industry ISIC Rev.3 classification, this indicator computes (i) basic goods, (ii) intermediate-semi finished goods, (iii) intermediate goods and components, (iv) final consumption goods and (v) final capital goods by the vertical disaggregation of production processes and examines the competitive position of Turkey with respect to other countries and time.

Figure 9: Product Market Effect, Low Technology (2000 - 2011)



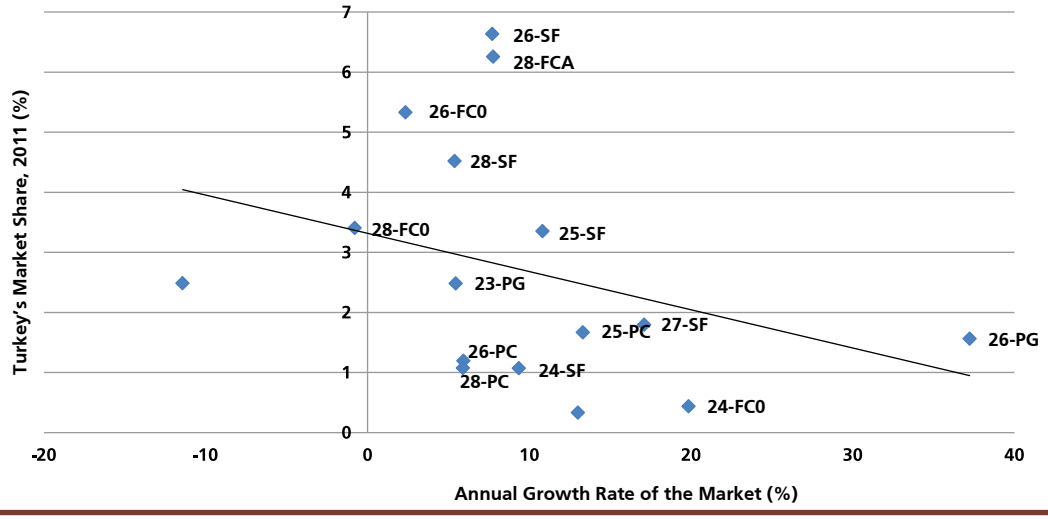
FYI: PG- Primary Goods; **PC-** Intermediate Goods- Parts and Components; **SF-** Intermediate Goods- Semi Finished; **FCA-** Final Capital Goods; **FCO-** Final Consumption Goods;

Source: Authors' calculations

5 This indicator also uses import values and shares in addition to export values and shares which are adopted as the basic data for "advantage in foreign trade." It can be considered as an indicator exhibiting "net" changes in the composition of exports. The indicator "contribution to trade balance" whose computation details are given in the Annex is a tool expressing to what extent and in which direction the performance of foreign trade oriented sectors in economy diverges from the level that the macroeconomic conjuncture points out.

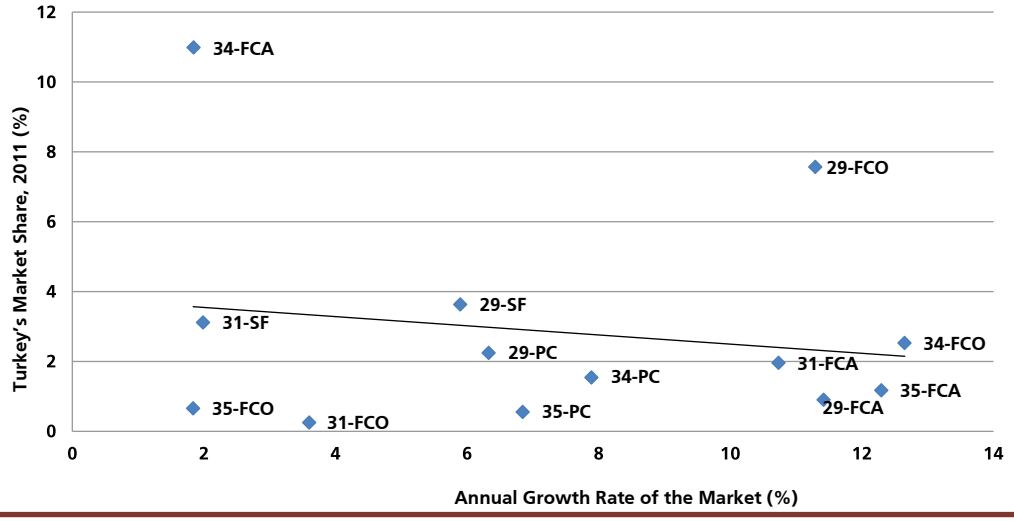
6 For the computation and properties of the RCA indicator used in this chapter see the Annex.

Figure 10: Product Market Effect, Medium-Low Technology (2000 - 2011)



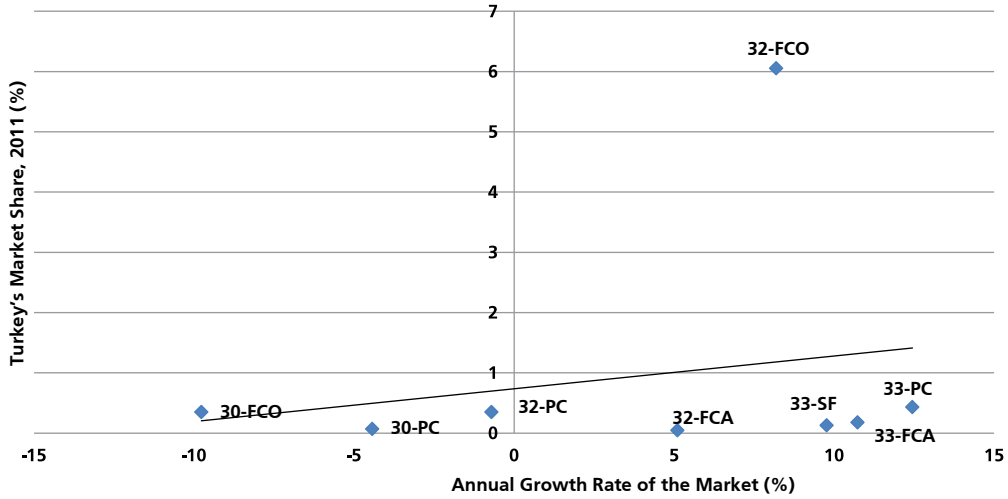
Source: Authors' calculations

Figure 11: Product Market Effect, Medium-High Technology (2000 - 2011)



Source: Authors' calculations

Figure 12: Product Market Effect, High Technology (2000 - 2011)



FYI: PG- Primary Goods; **PC-** Intermediate Goods- Parts and Components; **SF-** Intermediate Goods- Semi Finished; **FCA-** Final Capital Goods; **FCO-** Final Consumption Goods;

Source: Authors' calculations

Finally, Figures 9-12 give the average market share of Turkey corresponding to the average rate of growth in the same period in the trading of commodity groups in identified sectors/production processes[7]. This makes it possible to find out in which commodity group Turkey specializes in exports and to what kind of increases in exports it contributes.

4.3. Low Technology Sectors

Table 12 presents, for the period 1998-2009, contributions to foreign trade throughout production processes by low technology sectors, according to USSS, Rev3. International Standard Industrial Classification (ISIC- 15, 16, 17, 18, 20, 21, 22, 36).

It must be stated first that average annual rates of increase in exports of such traditional sectors as textiles, garments and foodstuffs as shown in Table 12 (which are 7.8%, 6% and 8.4%, respectively) remain quite below the average for manufacturing industry which is 13.6% for the same period. Again for the same period, average annual rates of increase in imports of these sectors are also below the average for manufacturing industry.

According to Table 12, low technology sectors in Turkish economy consistently make positive contribution to trade balance since 1998. Here, the traditional sectors that strike attention include Tobacco (16), Textiles (17), Garment (18) and Furniture (36) (shaded parts). Also important is the fact that there is decline in the positive contribution of these sectors, there is no significant change in the structure of production and in some sectors, for example Textiles (17) or Garments (18), Turkish firms remain as importers of intermediate goods and exporters of final consumption goods.

Table 16: Comparative Advantage Index by Stages of Production, Selected Economies, 1998 - 2009

	Turkey	Czech Republic	Hungary	Poland	Slovenia	Ukraine	Russia	China	India	South Korea	Malaysia	Singapore	Thailand	Argentina	Brazil	Mexico
(17) Textiles																
Primary Goods																
1998	0,10	-0,79	-0,38	-0,83	-2,69	1,18	1,78	-1,34	-2,11	-4,17	-1,03	0,24	-1,55	7,30	3,40	-3,95
2002	0,49	0,07	-0,22	-0,36	-3,84	0,10	1,61	-1,72	-2,98	-5,49	-2,77	-0,64	-2,47	7,53	0,87	-3,87
2007	0,02	0,60		-0,65	-3,05	-1,98	2,86	-1,38	-2,50	-4,79	-2,54	-0,18	-4,40	6,88	-0,25	-4,22
2009	1,10	0,93	-2,54	-1,67	-2,81	-2,13	2,04	-1,85	-1,96	-6,57	-2,91	1,78	-3,04	6,01	0,89	-3,97
Intermediate Goods Semi Finished																
1998	1,80	0,34	-1,25	-0,62	0,02	-0,50	0,45	-0,60	2,37	1,26	-0,21	-0,17	0,00	0,82	1,00	-0,95
2002	1,22	0,20	-0,91	-1,00	0,20	-0,48	0,69	-0,13	1,99	1,41	-0,09	-0,42	-0,01	0,80	0,73	-1,34
2007	1,26	0,14	-0,58	-0,77	0,05	-0,60	0,21	0,21	1,79	0,82	-0,11	-0,46	0,00	0,56	0,32	-1,39
2009	1,14	0,06	-0,66	-1,03	-0,09	-1,47	-0,14	0,32	1,49	0,84	0,04	-0,51	0,07	0,45	-0,05	-1,49
Intermediate Goods Parts & Components																
1998	-0,43	0,27	-1,53	-1,14	-0,66	-1,22	-0,02	-1,03	-0,56	-2,26	-1,01	-0,78	-3,04	0,85	0,14	-1,26
2002	-0,47	0,02	-0,98	-1,05	-0,41	-0,85	0,06	-1,27	-0,75	-1,37	-0,75	-0,65	-1,19	-0,87	-0,27	-1,36
2007	-0,65	-0,15	-0,93	-0,14	-0,14	-0,45	0,82	-1,18	-0,23	-1,01	-0,43	-0,01	-1,11	0,65	0,42	0,05
2009	-0,51	0,09	0,07	-0,11	-0,48	-1,14	-0,74	-0,83	-0,85	-0,84	-0,15	-0,60	-1,04	0,63	0,69	-0,49
Final Consumption Goods																
1998	5,26	0,87	0,94	1,84	0,74	1,29	-0,02	3,57	5,83	1,67	1,33	0,22	2,46	-0,39	2,13	1,02
2002	4,84	0,63	0,57	1,32	0,50	1,77	0,13	3,36	5,23	0,92	1,23	0,20	2,31	-0,04	2,81	0,99
2007	3,77	-0,05	-0,02	0,74	0,19	1,06	-0,82	3,63	4,67	-0,40	0,89	-0,33	2,06	0,12	1,81	0,93
2009	3,45	-0,14	0,01	0,52	0,03	0,33	-0,97	3,92	4,32	-0,03	1,10	-0,49	1,94	0,09	1,26	1,00

Source: Authors' calculations from UN Comtrade

7 While constructing Figure-1 and Figure-2, 20 economies as the leading export partners of Turkey are taken

Table 16 shows changes across time in the comparative advantage indicator of selected economies for different stages of production for the Textiles sector (17). According to this table, the sector has its significant positive contribution to the trade balance of Turkey and there is serious competition at the final stage of production (final consumption goods). In this specific sector, while India as one of the most competitive economies traditionally is gradually losing this status, Chine comes to the fore at both the final stage of production and at intermediate and semi-finished goods. It must be further observed that countries like Argentina and Brazil are trying to hold competitive positions at all stages of production. In one of its traditional sectors of specialization, Turkey appears to be losing its competitive advantage in both intermediate and semi-finished and final consumption goods.

We can take a look at Figure 9 to see the position of low technology sectors in terms of most important markets Turkey exports goods and the relative status of Turkey in these sectors. As Figure shows, Tobacco (16), Textiles (17) and Paper Products (21) are among the sectors enjoying highest rates of growth in final consumption goods and Turkey's market share in these goods is also large. On the other hand, while there is rapidly rising demand for semi-finished goods in the sectors of Furniture (36) and Food (15), Turkey's market share in economies concerned is rather weak.

As a general observation we can say that in the group of low technology goods, Turkey's market share in sectors that enjoy rapid growth is not increasing. Considering that the EU-15 has its weight in the group of countries concerned, it is possible to conclude that Turkey keeps specializing in exports of low technology goods to advanced countries.

4.4. Middle Technology Sectors

These sectors can be traced in Tables 13-14, 17 and Figure 10-11. The immediate observation is that middle-low technology sectors pave their weight in Turkey's production and foreign trade composition. The only sector in this group that contributes positively to trade balance is Motor Vehicles (34). It is also the only sector that displayed significant change in the period 1998-2009. Indeed, while this sector had its negative contribution to trade balance at all stages of production in 1998, afterwards it started to contribute positively at increasing rates for the final stages of production. Contribution at earlier stages of production, however, is negative at increasing rates. For the period after 1998, taking those sectors in manufacturing industry that have their positive contribution to foreign trade, we see no other sector but Motor Vehicles that displayed significant structural change in its processes of production. When production processes of these positively contributing sectors are concerned, Turkey again appears to be specializing only at the final stages of production (final consumption goods).

Table 17: Medium-Technology Sectors (Isic Rev.3)
Comparative Advantage Index by Stages of Production, Selected Economies, 1998 - 2009

	Turkey	Czech Republic	Hungary	Poland	Slovenia	Ukraine	Russia	China	India	South Korea	Malaysia	Singapore	Thailand	Argentina	Brazil	Mexico
(24) Chemicals and chemical products																
Primary Goods																
1998	-0,93	-1,47	-0,70	0,08	-1,55	0,07	0,19	-1,02	-1,69	-2,36	-1,65	0,21	-2,79	1,73	0,25	-2,23
2002	-1,23	-1,70	-1,00	-0,37	-1,10	0,72	-0,80	-1,37	-0,63	-1,57	-0,65	-0,02	-2,26	0,46	-1,62	-1,92
2007	-0,72	-1,60	-1,06	-0,46	-0,70	1,43	-0,80	-2,85	-1,07	-1,25	-0,81	-0,01	-1,78	1,87	-1,11	-1,48
2009	-0,49	-1,46	-1,21	-0,36	-0,75	1,42	-1,01	-2,85	-1,34	-1,31	-0,38	-0,48	-1,44	2,23	-0,66	-1,31
Intermediate Goods Semi Finished																
1998	-0,67	0,06	-0,19	0,28	-0,01	2,05	1,92	-1,36	-0,57	-0,28	-0,45	0,43	-1,14	0,85	0,01	-0,76
2002	-1,01	-0,31	-0,24	-0,30	-0,01	1,54	2,01	-1,49	0,12	0,29	0,16	0,97	-0,62	-0,25	-0,34	-0,90
2007	-1,01	-0,40	0,01	-0,20	0,04	1,22	2,65	-1,48	0,39	0,29	0,15	0,83	-0,39	0,62	-0,10	-0,84
2009	-1,04	-0,35	-0,09	-0,49	-0,04	0,31	2,50	-1,48	-0,10	0,46	0,30	0,87	-0,33	1,04	0,08	-0,85
Final Consumption Goods																
1998	1,05	-0,42	-0,53	-0,15	1,13	-0,42	-2,04	-0,10	2,13	-0,28	-0,28	-0,33	-0,94	1,20	-0,11	0,03
2002	-0,06	-0,56	-0,43	-0,52	1,18	-1,00	-1,03	-0,28	2,03	-0,36	0,12	-0,17	-0,29	0,34	-0,23	0,13
2007	-0,01	-0,59	0,03	-0,06	1,34	-1,08	-0,16	-0,77	2,18	-1,42	0,34	0,95	-0,30	1,55	-0,03	-0,03
2009	1,05	-0,42	-0,53	-0,15	1,13	-0,42	-2,04	-0,10	2,13	-0,28	-0,28	-0,33	-0,94	1,20	-0,11	0,03
(29) Manufacture of machinery and equipment																
Intermediate Goods Semi Finished																
1998	0,63	0,61	0,33	0,06	2,00	-0,50	0,05	0,18	0,76	0,59	0,04	-0,15	-1,03	-0,45	0,60	0,38
2002	0,79	0,36	0,18	0,50	1,40	-0,96	-0,55	0,55	0,57	0,75	-0,07	-0,06	-0,40	-0,44	1,64	0,64
2007	0,85	0,24	0,21	0,06	0,79	0,69	0,18	0,41	0,67	-0,05	0,33	0,59	-0,42	0,04	1,21	0,66
2009	0,63	0,61	0,33	0,06	2,00	-0,50	0,05	0,18	0,76	0,59	0,04	-0,15	-1,03	-0,45	0,60	0,38
Intermediate Goods Parts & Components																
1998	-0,30	0,66	-0,22	0,72	0,83	1,33	0,56	-1,51	-1,09	-1,14	-1,53	-0,35	-1,11	0,31	-0,05	-0,39
2002	-0,28	0,52	0,01	0,38	0,80	1,53	0,77	-0,68	-0,41	-0,30	-0,95	-0,26	-0,95	-0,46	-0,34	-0,13
2007	0,38	0,33	0,01	0,41	0,94	1,31	1,07	-0,69	-0,09	-0,15	-0,72	-0,20	-0,35	0,16	0,16	-0,03
2009	-0,30	0,66	-0,22	0,72	0,83	1,33	0,56	-1,51	-1,09	-1,14	-1,53	-0,35	-1,11	0,31	-0,05	-0,39
Final Capital Goods																
1998	-1,04	0,21	-0,96	-0,52	-0,05	0,13	-1,09	-2,04	-0,91	-0,52	-1,33	-0,49	-1,38	-0,31	0,12	-1,42
2002	-0,80	0,07	-0,96	-0,56	0,07	0,89	-0,40	-1,87	-0,68	-0,13	-0,88	-0,34	-1,30	-0,25	0,17	-0,84
2007	-0,34	0,30	0,01	-0,28	0,19	-0,23	-0,41	-1,28	-0,77	-0,24	-0,62	-0,34	-0,71	-0,22	0,69	-0,50
2009	-1,04	0,21	-0,96	-0,52	-0,05	0,13	-1,09	-2,04	-0,91	-0,52	-1,33	-0,49	-1,38	-0,31	0,12	-1,42
Final Consumption Goods																
1998	1,42	-0,09	0,72	0,25	2,58	1,09	-0,50	2,96	0,24	2,39	2,01	0,40	2,46	-1,43	1,71	1,40
2002	2,52	-0,19	0,73	0,53	2,54	0,52	-1,05	3,00	0,40	2,50	1,63	0,44	2,48	-0,20	2,41	1,38
2007	2,47	0,38	0,88	1,32	1,90	0,08	-0,46	3,44	0,04	1,65	1,41	0,36	2,52	-0,68	1,50	1,46
2009	1,42	-0,09	0,72	0,25	2,58	1,09	-0,50	2,96	0,24	2,39	2,01	0,40	2,46	-1,43	1,71	1,40
(31) Electrical machinery and apparatus																
Intermediate Goods Semi Finished																
1998	2,26	0,19	0,70	1,15	-0,12	1,10	0,30	0,06	-0,03	0,21	-0,15	-0,55	-1,18	0,59	-0,64	0,29
2002	2,24	0,62	0,70	1,03	0,12	1,19	0,71	0,49	0,00	0,52	0,40	-0,26	-0,93	0,21	-0,09	0,28
2007	1,70	-0,06	0,11	0,95	-0,49	0,53	1,10	0,73	0,17	0,80	0,41	-0,33	-0,21	0,64		0,42
2009	2,26	0,19	0,70	1,15	-0,12	1,10	0,30	0,06	-0,03	0,21	-0,15	-0,55	-1,18	0,59	-0,64	0,29
Intermediate Goods Parts & Components																
1998	0,29	0,58	0,72	1,12	0,83	1,09	0,43	-0,72	-0,35	-0,99	-0,93	-0,07	-0,71	-0,06	0,02	0,40
2002	0,05	0,61	0,32	1,06	0,94	1,41	0,64	-0,59	-0,02	-0,26	-0,23	0,22	-0,11	-0,46	-0,09	0,66
2007	0,60	0,45	0,16	0,85	1,03	1,40	0,77	-0,80	0,08	0,04	0,02	0,19	-0,12	-0,38	0,47	0,55
2009	0,29	0,58	0,72	1,12	0,83	1,09	0,43	-0,72	-0,35	-0,99	-0,93	-0,07	-0,71	-0,06	0,02	0,40
Final Capital Goods																
1998	0,38	0,55	-0,23	0,72	0,80	1,62	0,51	0,25	-0,02	-0,61	-0,41	-0,19	-0,60	-1,25	-0,13	0,96
2002	0,27	0,40	-0,35	0,47	0,85	1,80	1,07	0,03	-0,20	-0,55	-0,26	0,03	0,42	-0,81	-0,77	0,66
2007	0,07	0,48	-0,72	0,40	0,97	1,74	0,68	-0,08	0,59	-0,80	-0,77	0,12	-0,30	-0,57	0,93	0,67
2009	0,38	0,55	-0,23	0,72	0,80	1,62	0,51	0,25	-0,02	-0,61	-0,41	-0,19	-0,60	-1,25	-0,13	0,96

Table 17: Medium-Technology Sectors (Isic Rev.3)
Comparative Advantage Index by Stages of Production, Selected Economies, 1998 - 2009 (continued)

	Turkey	Czech Republic	Hungary	Poland	Slovenia	Ukraine	Russia	China	India	South Korea	Malaysia	Singapore	Thailand	Argentina	Brazil	Mexico
(31) Electrical machinery and apparatus																
Final Consumption Goods																
1998	0,76	-0,31	2,11	1,92	-0,43	0,38	-0,13	0,91	0,47	0,30	-0,99	0,53	0,56	-0,24	0,00	0,44
2002	-0,85	-0,86	1,98	1,66	-0,98	0,88	0,07	1,30	0,63	0,69	-0,85	0,75	0,52	-1,41	0,35	-0,03
2007	-1,03	-0,90	1,51	1,30	-0,50	0,56	-0,63	0,98	-0,68	-0,22	-0,64	0,23	-0,46	-0,88	-0,27	-0,29
2009	0,76	-0,31	2,11	1,92	-0,43	0,38	-0,13	0,91	0,47	0,30	-0,99	0,53	0,56	-0,24	0,00	0,44
(34) Motor vehicles and trailers																
Intermediate Goods Parts & Components																
1998	0,46	0,63	0,95	-0,36	-0,61	0,60	0,74	-1,23	0,22	-0,28	-0,96	-0,17	-0,76	0,65	1,30	-0,14
2002	0,76	0,66	0,81	1,37	-0,13	0,53	0,85	-0,91	0,77	0,30	-1,11	-0,21	-1,08	0,19	1,12	-0,13
2007	0,42	0,47	0,63	1,15	0,08	-1,40	0,36	-0,75	0,79	0,93	-0,77	0,18	-0,12	0,68	1,21	0,27
2009	0,46	0,63	0,95	-0,36	-0,61	0,60	0,74	-1,23	0,22	-0,28	-0,96	-0,17	-0,76	0,65	1,30	-0,14
Final Capital Goods																
1998	0,27	0,31	-0,91	0,85	-0,72	0,23	0,03	0,84	2,80	2,77	-0,07	-1,34	2,11	1,43	1,23	1,54
2002	2,18	-0,65	-1,53	0,41	-0,75	0,18	1,21	0,95	2,03	1,85	-2,07	-1,48	2,18	2,28	1,21	1,52
2007	2,23	-0,36	-1,03	0,20	-1,06	-0,42	0,69	1,68	2,65	1,55	-0,71	-0,68	2,08	1,99	2,12	1,38
2009	0,27	0,31	-0,91	0,85	-0,72	0,23	0,03	0,84	2,80	2,77	-0,07	-1,34	2,11	1,43	1,23	1,54
Final Consumption Goods																
1998	-0,75	1,68	0,22	0,98	1,13	-3,12	0,17	-3,14	2,05	5,80	-1,07	-1,28	-0,95	1,92	0,61	1,87
2002	1,60	1,47	0,41	0,19	1,14	-4,13	0,05	-4,39	1,38	3,35	-2,23	-2,06	0,95	1,55	1,79	1,12
2007	1,55	1,48	0,69	0,92	0,98	-0,82	-1,19	-2,14	2,43	2,71	-1,91	-1,44	2,56	1,31	1,31	1,06
2009	-0,75	1,68	0,22	0,98	1,13	-3,12	0,17	-3,14	2,05	5,80	-1,07	-1,28	-0,95	1,92	0,61	1,87

Source: Authors' calculations from UN Comtrade

Among middle-low technology sectors, the Basic Metal Industry (27) displayed change in structural terms. While in 1998 and 2002 this sector had negative contribution to trade balance in terms of the group of intermediate goods and semi-finished products, it contributed positively at a significant level in 2009. Plastic and Rubber (25) and Mineral Products (26) have been sectors which traditionally have their positive contribution to trade balance at various stages of production. However, the decline in time of this positive contribution may be interpreted as Turkey's gradually weakening comparative advantage in these sectors in the face of intensive competition.

Table 17 gives comparative advantage index analyses by production processes for middle-high technology sectors of Chemicals and Chemical Products (24), Machinery and Equipment (29), Electrical Machinery and Devices (31) and Motor Vehicles and Trailers (34). We observe from these analyses that Electrical Machinery and Devices (31) and Motor Vehicles (34) are those middle technology sectors which, in the global market, Turkey has its comparative advantage at various stages of production. Though partly, Machinery and Equipment (29) can be added to this group for its positive contribution in semi-finished goods.

Compared, for example, to Chemicals and Chemical Products (24), foreign trade in Machinery and Equipment sector (29) seems to extend over a wider geography. For the group of developing economies addressed in this part of the study, this particular sector seems to hold an advantageous position in general. However, when Europe is taken as a geographical unit, Turkey is at advantageous position at the first and final stages of production while the Czech Republic, Hungary, Poland, Slovenia and Ukraine enjoy advantage at almost all stages of production.

Together with the global turbulence, Turkey's comparative advantage index for final consumption goods is falling for the year 2009 while that of Slovenia and Ukraine is rising. In this sector, India, Brazil and Mexico

display positive trade contribution in intermediate goods as semi-finished products while Brazil in Latin America; China, South Korea, Thailand and Malaysia in Asia have significant advantage when it comes to final consumption goods. It is observed that in the category of final consumption goods that Turkey has its comparative advantage competition covers a rather wide geography and Turkey has managed to retail its comparative advantage over time.

In the sector of Electrical Machinery and Devices (31) and in the global market, Turkey has its advantage at the earlier stages of production (intermediate and semi-finished goods); Hungary, Poland, Ukraine and China at final stages (final consumption goods); and Ukraine and Poland at intermediate stages. Poland and Ukraine (and though partly and to a lesser degree Russia) come to the fore in this category for having extended their foreign trade advantages to almost all processes in producing. In this sector, Mexico too seems to improve its foreign trade advantage at least partly.

The sector of Motor Vehicles (34) turned out to be a special sector for Turkey in the 2000s in terms of both productivity and increase in exports. The development of comparative advantage index in this sector supports observations made so far on this particular sector. The Turkish economy built foreign advantage in this sector especially at the final stages of production and consolidated this advantageous position in the 2000s. In this sector, South Korea and India are the two countries enjoying the highest comparative advantage in terms of both final capital and final consumption goods. Having their comparative advantage in the world market, of the group composed of Argentina, Brazil and Mexico, Mexico and partly Brazil have their weight in the EU market. In the same sector and for Europe, countries resembling Turkey in terms of production and foreign trade composition are the Czech Republic, Hungary and Poland while Turkey is still the most advantaged one in final capital goods.

Figures 10-11 give, with respect to the most important markets that Turkey is exporting to, the state of middle-low and middle-high technology sectors and Turkey's market share in these sectors (as of 2009). The overall outlook of Turkey in both commodity groups is that country's market share is larger in those where increase in demand is relatively slower. Thus, structural change observed in Turkey's foreign trade is towards increase in market share of slowly growing commodity groups, a situation which calls for careful examination with reference to overall process of competition.

According to Figure 10, Turkey's market share in final and semi-finished goods under the sectors Mineral Products (26) and Metal Products (28) is large; however, the rates of increase in demand for these goods in markets that bear importance for Turkey are low.

Coming to the group of Chemical Goods (24) with high demand at all stages of production, Turkey's market share in these goods is extremely low. Taking the group of goods with middle-high technology, goods that Turkey has its serious market share in important markets are extremely limited (Figure 11). Here, with the exception of final capital and consumption goods under Motor Vehicles (34) and final consumption goods under Machinery and Equipment (29) there is no group that Turkey has a significant market share. On the other hand, given external markets that are important for Turkey, intermediate goods, parts and components under Motor Vehicles (34) and final capital goods under Machinery and Equipment (29), Electrical Machinery and Devices (31) and other Transportation Vehicles (35) are those in which there is relatively high increase in imports.

4.5. High Technology Sectors

Tables 15, 18 and Figure 12 are informing for the analysis of high-technology sectors. As shown in Table 15, except for the final stage of production, Radio, Television and Communication Equipment and Devices (32) contribute negatively to the foreign trade balance of these sectors. In the 2000s, Radio, Television and Communication Equipment and Devices which have its special place together with the sector of Motor

Vehicles (34) in terms of both output and productivity and increase in exports, accounted for 3.2% of total exports and 4.1% of total imports. For this sector Table 15 identifies, only for the final stage of production, positive contribution to foreign trade which is gradually declining throughout the 2000s. Indicators in Table 18 as well point out that in the course of time Turkey could maintain its advantageous position only at the final stage of production. In Europe, it is worth noting that of the Czech Republic, Hungary and Poland as Turkey's competitors at the final stage of production in this sector, the first two could manage to extend value added production to different stages of production and consequently turned their previously disadvantaged position into an advantaged one. Of course, South Korea, Malaysia, China and Thailand have their advantages in this sector.

The first observation that can be made in relation to Office, Accounting and Computing Machinery (30), Radio, Television Communication Equipment and Devices (32) and Medical Devices; Precision Optic Devices and Watches (33) which fall into high technology sectors according to ISIC Rev3 is that trade patterns of these sectors concentrate in a relatively narrower geography (mainly Asia) compared to middle technology sectors. In Office, Accounting and Computing Machinery (30) sector, Singapore and Thailand seem to have advantage at the early stages of production and foreign trade while China, South Korea and Malaysia enjoy an advantage that has been increasing throughout the 2000s at all stages of value added production. Chine has its unquestionable advantage in intermediate and final goods category of this sector.

Table 18: High-Technology Sectors (Isic Rev.3)
Comparative Advantage Index by Stages of Production, Selected Economies, 1998 - 2009

	Turkey	Czech Republic	Hungary	Poland	Slovenia	Ukraine	Russia	China	India	South Korea	Malaysia	Singapore	Thailand	Argentina	Brazil	Mexico
(30) Office, accounting and computing machinery																
Intermediate Goods Parts & Components																
1998	-1,69	-0,06	-0,01	-1,20	-1,09	-0,88	-0,91	-0,55	-1,50	-0,70	0,95	0,49	1,12	-1,02	-0,93	1,21
2002	-1,93	0,32	-0,55	-1,73	-1,33	-0,79	-0,86	-0,01	-1,43	1,64	1,27	0,26	0,88	-1,46	-1,30	-0,26
2007	-1,46	-0,65	-1,18	-0,90	0,02	0,51	-0,69	0,08	-1,16	1,25	0,59	0,27	-0,36	-1,97	-1,96	-0,10
2009	-1,69	-0,06	-0,01	-1,20	-1,09	-0,88	-0,91	-0,55	-1,50	-0,70	0,95	0,49	1,12	-1,02	-0,93	1,21
Final Capital Goods																
1998	-1,47	-0,72	1,92	-1,60	-2,29	-0,54	-0,19	1,11	-1,90	1,09	1,75	1,77	1,66	-1,74	-0,29	1,17
2002	-2,01	0,58	0,98	-1,77	-1,90	-1,57	-0,49	1,01	-1,11	1,24	2,11	1,72	0,54	-1,01	-0,91	1,14
2007	-2,04	0,75	1,02	-1,09	-1,46	-1,43	-1,01	1,29	-1,59	0,69	1,88	0,62	1,81	-2,11	-0,82	0,71
2009	-1,47	-0,72	1,92	-1,60	-2,29	-0,54	-0,19	1,11	-1,90	1,09	1,75	1,77	1,66	-1,74	-0,29	1,17
Final Consumption Goods																
1998	-4,60	-2,53	-2,06	-3,11	-2,93	-2,21	-1,95	4,73	-0,04	-1,71	1,93	0,58	5,52	-3,31	-4,94	-1,07
2002	-3,03	-1,68	-2,47		-2,98	-1,88	-3,43	3,34	-1,71	-4,81	1,09	0,40	0,91	-2,43	-5,86	0,19
2007	-3,11	-0,19	-2,96	-2,20	-1,01	-0,46	-3,25	2,53	-1,77	-4,58	0,36	-0,12	-0,71	-2,79	-5,67	-2,38
2009	-4,60	-2,53	-2,06	-3,11	-2,93	-2,21	-1,95	4,73	-0,04	-1,71	1,93	0,58	5,52	-3,31	-4,94	-1,07
(32) Communication and apparatus																
Intermediate Goods Parts & Components																
1998	-1,16	-0,47	-0,72	0,59	-0,38	0,22	0,30	-1,29	-1,61	-0,06	-0,37	0,14	-0,62	-0,80	-0,59	-0,67
2002	-2,01	-0,62	-0,87	-0,05	-0,22	0,33	0,23	-1,47	-1,12	0,23	-0,08	0,51	-0,23	-0,92	-0,75	-0,76
2007	-1,01	-0,53	-0,94	-0,01	0,36	0,43	0,71	-0,81	-0,62	0,70	-0,05	0,64	-0,47	-0,15	-1,58	-1,07
2009	-1,16	-0,47	-0,72	0,59	-0,38	0,22	0,30	-1,29	-1,61	-0,06	-0,37	0,14	-0,62	-0,80	-0,59	-0,67
Final Capital Goods																
1998	-1,19	-0,17	1,25	-1,22	0,68	-0,92	-1,90	-0,01	-0,93	0,96	1,53	0,39	0,46	-2,83	-0,88	0,35
2002	-1,40	0,30	1,33	-1,33	0,57	-0,51	-0,89	0,85	-2,62	1,56	1,42	0,34	0,01	-0,56	1,19	0,88
2007	-1,77	-0,09	1,34	-1,16	-0,69	0,39	-1,74	1,31	-2,64	1,83	1,42	0,05	0,14	-2,98	1,43	0,82
2009	-1,19	-0,17	1,25	-1,22	0,68	-0,92	-1,90	-0,01	-0,93	0,96	1,53	0,39	0,46	-2,83	-0,88	0,35
Final Consumption Goods																
1998	3,58	0,83	1,19	2,06	1,00	-1,93	0,26	2,14	0,41	2,29	4,63	0,65	3,52	-1,04	-0,81	2,21
2002	3,91	1,47	1,73	2,38	1,18	-2,60	-3,35	3,83	0,09	1,94	3,12	0,12	2,14	1,10	1,63	2,46
2007	2,95	1,40	2,18	2,38	-1,10	-2,87	-2,61	2,79	-1,30	1,70	2,24	-0,39	1,92	-1,28	0,15	3,96
2009	3,58	0,83	1,19	2,06	1,00	-1,93	0,26	2,14	0,41	2,29	4,63	0,65	3,52	-1,04	-0,81	2,21

Table 18: High-Technology Sectors (Isic Rev.3)
Comparative Advantage Index by Stages of Production, Selected Economies, 1998 - 2009 (continued)

	Turkey	Czech Republic	Hungary	Poland	Slovenia	Ukraine	Russia	China	India	South Korea	Malaysia	Singapore	Thailand	Argentina	Brazil	Mexico
(33) Medical, precision and optical instruments																
Intermediate Goods Semi Finished																
1998	-1,05	0,22	0,56	-0,38	0,53	0,04	0,58	-1,38	-0,78	-0,78	-0,43	0,35	0,44	-1,16	-0,83	-0,65
2002	-1,74	-0,02	0,07	-1,05	0,95	-0,02	1,14	-1,21	-0,45	-0,77	-0,23	0,04	0,85	-0,46	-0,65	-1,13
2007	-2,15	0,09	0,37	-0,93	0,07	1,63	0,88	-1,53	0,02	-0,26	0,04	-0,04	0,95	-1,68	-0,49	-0,45
2009	-1,05	0,22	0,56	-0,38	0,53	0,04	0,58	-1,38	-0,78	-0,78	-0,43	0,35	0,44	-1,16	-0,83	-0,65
Intermediate Goods Parts & Components																
1998	-0,11	-0,12	-0,09	0,06	0,06	0,22	0,63	-1,32	-1,94	-2,59	-1,46	-0,42	-2,09	-0,51	-0,55	-0,40
2002	-1,09	-0,36	0,41	0,17	0,26	1,01	1,18	-1,16	-0,80	-1,66	-0,36	-0,07	-1,84	-0,68	-0,82	-0,03
2007	-0,34	-0,44	0,60	-0,55	0,10	0,54	1,28	-1,83	-0,48	0,75	-0,12	-0,37	-0,44	-0,71	-0,77	-0,42
2009	-0,11	-0,12	-0,09	0,06	0,06	0,22	0,63	-1,32	-1,94	-2,59	-1,46	-0,42	-2,09	-0,51	-0,55	-0,40
Final Capital Goods																
1998	-1,41	-0,34	-0,63	-0,70	0,63	0,49	-0,05	-1,06	-1,67	-0,84	-0,89	-0,22	-1,02	-0,39	-1,03	0,10
2002	-1,47	-0,36	-0,18	-0,57	0,65	1,08	0,72	-1,66	-1,01	-1,27	0,21	0,41	-0,89	-0,44	-1,04	0,46
2007	-1,09	0,00	0,96	-0,54	0,55	-0,34	0,65	-1,50	-0,80	0,95	0,34	0,02	-0,86	0,22	-0,95	0,10
2009	-1,41	-0,34	-0,63	-0,70	0,63	0,49	-0,05	-1,06	-1,67	-0,84	-0,89	-0,22	-1,02	-0,39	-1,03	0,10
Final Consumption Goods																
1998	-1,46	-0,49	-1,19	-0,82	0,54	-0,86	-0,09	2,96	0,43	0,24	1,04	0,13	0,62	-0,69	-0,73	0,54
2002	-1,49	-0,97	0,45	-0,79	0,32	-0,69	-0,27	1,51	0,49	-0,66	0,84	0,22	0,39	-1,30	-0,83	0,24
2007	-1,43	-1,02	-1,17	-0,63	0,68	-1,38	-1,08	0,05	-0,71	-1,40	-0,09	-0,07	-0,42	-0,80	-0,69	0,25
2009	-1,46	-0,49	-1,19	-0,82	0,54	-0,86	-0,09	2,96	0,43	0,24	1,04	0,13	0,62	-0,69	-0,73	0,54

Source: Authors' calculations from UN Comtrade

Though a high technology sector in which we generally see the dominance of developed economies, the existence of developed economies in Medical Devices; Precision Optic Devices and Watches (33) seems to be limited. China, Malaysia and partly Thailand appear as having specialized at the stage of final consumption goods, the only economy in the trade of final capital foods is Slovenia. For the intermediate goods stage of production, Russia, Slovenia and Thailand are in the picture although not strongly. Turkey is internationally disadvantaged at all stages of production in this sector and the sector share in Turkey's foreign trade is extremely limited (i.e. as the average of the 2000s, 0.29% in total exports and 2.1% in total imports).

5. WHICH TURKEY? MIDDLE-INCOME TRAP, REGIONAL ANALYSIS OF MACRO PROBLEM

5. WHICH TURKEY? MIDDLE-INCOME TRAP, REGIONAL ANALYSIS OF MACRO PROBLEM

5.1. Implementation of Meso-Economic Policy: Why Regional Development?[8]

Various regional development policies have been implemented in Turkey throughout the planned period. It now appears that desired outcomes could not be achieved through different policy tools including regional development projects, province and region-based planning experiences, policy of regions with priority in development and incentives tailored to specific regions. One of the reasons is focusing on the outcomes of regional underdevelopment rather than its causes. One can speak of a set of problems including poverty and imbalances in income distribution, low quality of labour force, poor institutional capacity at local level, excessive rural-to-urban migration and population movements between provinces and a distorted pattern of urbanization.

Now, these are all reflections of fundamental problems in economic structure to the social sphere. It must be recognized that the issue of regional development needs to be approached from an economic perspective and that undesirable social outcomes are the reflections of the absence of this perspective. In the same vein, another reason why desired success could not be reached in regional development policies is that the understanding of regional development have not been supported sufficiently by other areas such as agricultural development, selection of sites for industrial enterprises and transportation, capital movements, monetary policy and financing system, foreign trade and international relations.

Perhaps the most important problem in shaping economic policies that still maintains its effect along with stronger emphasis on regional development is addressing these policies from a monolithic perspective that is exclusively either sector- or institution-focused. Yet, Turkey is at different stages of development in terms of its regions. As it is the case internationally, there are disparities between the regions of a given country, and differences with respect to the distribution of economic and natural resources. It should be clear that policies that take Turkey as a homogeneous unit and are implemented by disregarding regional characteristics would not yield desired outcomes.

Paul Krugman's *Theory of Economic Geography* refuses homogeneity in development planning and regards it necessary to develop an economic approach to differences between geographical regions within a given country. The soundest way in analysing the competitive power of a country at global level is to examine the sector-based competitiveness of its regions in terms of international trade and to be well aware of what is happening *within* the country. The simplest and explanative indicators of this, in turn, are the rates of growth of Gross Regional Output (GRO) and level of regional specialization with respect to sectors, firms and labour force qualifications. Yet, it is difficult to say that international trade analyses make use of the theory of economic geography and position. In such analyses, countries are taken as units without any dimension and their geographical position and characteristics are almost totally omitted. In fact, however, costs of transportation may differ for two neighbouring regions of a specific region within the country even when their distances to the region concerned are the same. For example the transportation infrastructure between the central region and one of its neighbours can be better than that of the other neighbouring region and thus the distance in-between may be shorter temporally. Thanks to rapid access to the market, transportation and logistics costs are reduced; this has its implications to the cost of the good traded and the firm marketing this god gains upper hand in competition.

8 TAŞCI, Kamil, Rise of Meso-Economic Policy:Why Regional Development?, Martı Dergisi, Zafer Kalkınma Ajansı, November 2011

Bursa, Kocaeli, Sakarya, Eskişehir, Gaziantep, Denizli and Kayseri which fit to the stage what Rostow calls "take-off" are now experiencing the period of early industrialization. In coming years, these provinces may be expected to increase their terms of trade significantly and have their services sector gain further weight. For these provinces with high potential in terms of competing in global markets, it may be important to pursue supply-sided policies on which information economies can flourish. In short, the Turkish economy does not display a homogeneous structure.

The impact of "national" strategies, plans and programmes developed and implemented without taking into account the "region" that is, the "geography" where people live and production takes place is felt, to a large extent, only at the centre (Ankara as political centre, İstanbul as economic centre, and İzmir, Gaziantep, Bursa, Konya, Kayseri, Denizli, Adana as semi-centres or regional centres) while almost with zero effect in the remaining semi-centres and provinces. Most striking examples of this situation can be given on the basis of findings obtained by Taşçı and Özsan (2011)[9] through their Index of Regional Discontent. In their work, Taşçı and Özsan used the technique of "Principal Components Analysis" as their statistical method, having rates of inflation and unemployment as indicators of economic discontent and net migration rate, crude divorce rate, crude suicide rate, rates of crime and participation to general elections as indicators of social discontent. For the period 2007-2010, the ranking by levels of discontent has not changed and we see TRC3 Mardin, Batman, Şırnak, Siirt, TRB2 Van, Muş, Bitlis, Hakkari and TRC2 Şanlıurfa, Diyarbakır as regions with highest levels of economic and social discontent. To put it more bluntly, interest-exchange rate, minimum wage, taxation and incentive policies have had no feeding and stimulating effects in these regions. It can be inferred that these regions have broken apart from the agenda of the centre and have their own distinct agenda. Regional development programmes also target economic integration among regions. As a result of development programmes developed and implemented centrally, from afar and focusing on a single and homogeneous region (Turkey) there emerged a country made up of disassociated regions dependent to Ankara administratively and to İstanbul economically.

The Turkish economy does not display a homogeneous structure and within its heterogeneity centrifugal and centripetal effects in the context of centre-periphery relations are associated with the distance between the centre and its peripheral regions. It is to the extent that economic relations between Diyarbakır and Şanlıurfa as two neighbouring cities are more limited than each of these provinces relations with distant İstanbul.

Putting it another way, the periphery is largely broken apart from the economic agenda of the centre and centrally taken decisions as well as national-level policies neither fully support the global political and economic competitiveness of the centre itself nor have their expected impact on the periphery. The periphery benefit from these policies only *indirectly* via inducing effect of the centre. The time lag in-between may manifest itself in various forms including migration from the periphery to the centre.

Migration confronts us not only as a rupture in economic terms but also as a problematic process that may lead to accumulated social devastation if not balanced off or counter-checked with some measures. Pertinent measures include, for example, providing realistic ground for such overall intentions as "encouraging entrepreneurship and mitigating disparities in income distribution" which appear in national strategies in all periods and defining specific regional policy steps to be taken with due account of the dynamics of each region.

These policy steps will emerge as a result of a synthesis that technocrats at regional level will reach after serious analyses and a well-designed process of governance on the basis of scrupulous and scientific approaches. There is need for the scrupulousness of an economist and practice orientation of a technocrat

9 TAŞCI, Kamil and Mehmet Emin ÖZSAN, "Bölgesel Hoşnutsuzluk Endeksi", 12. Uluslararası Ekonometri, Yöneylem Araştırması ve İstatistik Sempozyumu, 26-29 May 2011, Pamukkale Üniversitesi-DENİZLİ, http://eyi.pau.edu.tr

to carry out preliminary analysis (diagnosis) of the problem, develop methods to eliminate it (synthesis) and to test policy suggestions with reference to various scenarios.

Meanwhile, the economic nature of sectors to be supported should be analyzed well while selecting regional incentives. It is already clear in regions where agricultural production is dominant incentives focusing solely on production have not been and will not be successful. The core problem in agricultural products based on low quality labour force and technology is restricted market access and low income elasticity for these products. Hence, measures geared to clearing the channels of demand will give better results than encouraging production.

Besides, in regions where goods requiring advanced technology and qualified labour force, an incentives system focusing on the supply side will promise more success. Innovative goods will create their own demand since these gods have low demand elasticity and it is possible to reap monopoly profits in the short-term.

The two points highlighted above show that neither at national not at regional level can economic policies yield successful results in reducing inter-regional development disparities. It is because of the fact that Turkish economy does not display a homogeneous structure. Hence, the approach of taking Turkey as a homogeneous unit and developing national policies accordingly runs counter to realities. A close examination of the development processes of advanced countries will show that regional approach has its weight in the implementation of macroeconomic policies. Given any country, it is observed more frequently that social problems emerge particularly in regions with thin or weak economic basis. In such problematic regions, it is beyond doubt that stronger economic basis and improvement in welfare levels will not be sufficient alone for the solution of all accumulated social problems. However, it is still clear that these will contribute to covering further distance in the elimination of these problems.

In this context, it is now time to abandon the approach of adopting the mitigation of regional development disparities as the single basic aim of regional development policies. What is needed instead is to reach at least the minimum level of decent living standards in each region and launch differentiated policy initiatives appropriate to the phase of development in each region.

One of the crucial points in developing regional policies or identifying national policies also having regard to individual regions is problems faced in the venues of "understanding the region." What is meant by "understanding" here is a framework of monitoring, evaluation and analysis consisting of a set of indicators that makes it possible to grasp the socioeconomic dynamics of a given region. Such a framework is necessary since economic development in a country does not take place at the same level for all regions in a given period of time. Conducting studies on the causes and outcomes of this situation will contribute positively to policy development and improving the quality of decision making processes.

The fundamental approach that distinguishes information society from industrial society in philosophical terms is the quantum thinking that refuses monolithic structure and homogeneity and concedes the possibility of intermediate values, inferences and approaches instead of absolute and sharp contrasts like thesis-antithesis, black-white etc. As far as regional development is concerned, there is no single and perfect recipe for development due to the very nature of regional development itself. In this context, the approach that abstains from regarding all regions in a country as homogeneous can be stated, in a sense, as the development approach of information society. From the point of the science of economics, an economic policy which places the theory of indigenous growth at its centre in regard to development dynamics may be assumed to have the potential of yielding more successful results at industrialized centres like Ankara, İstanbul, İzmir, Kocaeli and Bursa while the option of employment-focused neo-Keynesian policies based on differentiated public interventions may be considered for underdeveloped regions characterized by such problems as difficulties in establishing industrial base and marketing, very low levels of education and ongoing outmigration.

In a period when the targets of the "Vision 2023" are adopted by all sections of the country and when preparations for the 10th Development Plan gain speed, it is necessary to analyze in detail those risks that may halt the progress towards 2023 and to present alternative sets of solution that would guarantee this progress. This, in turn, requires a scrupulous regional analysis that is in compliance with growth paradigms.

All regions in Turkey contribute to national growth to this or that extent. In our day, with the new regional development paradigm, it has started to become the basic issue for policy makers to investigate to what extent individual regions contribute to growth at national level. The recent economic geography of Krugman and, in particular, the global crisis for which no definite date can be given for its ending and, according to some, which may have a double bottom are the main factors accounting for this new trend.

In order to maximize national growth, it is necessary to analyze in detail economic activities taking place in sub-regions, structures of production and the composition of foreign trade. It will be possible after these analyses to come up with synthesizing policies that are based on increases in productivity, that support R&D and innovation and aim at narrowing regional trade and technology gaps by taking each region together with its dynamics.

Here, the major questions will be "how should the framework of research and analysis be?" and "as a result of these analyses, which findings will lead to what kind of policies?"

Each analysis or a set of analyses have their theoretical framework and philosophy. Before analysing regional risks in Turkey with respect to middle-income trap, it is necessary to clarify the economic geography approach and analytical framework associated with it.

5.2. Theoretical Framework

In economic terms, each production process and supply and demand which instantaneously determine the price take place in a market mechanism whether developed or not and in a specific geographical location. There is a rich literature in the science of "Economic Geography" related to the selection of site for production. Adam Smith, known as the founder of modern economics, has two main emphases in his book "The Wealth of the Nations." One of these is the "invisible hand" which spontaneously regulates the economic system which is based on utility theory. According to this, the sum total of utilities of individuals or enterprises make up social utility. The second important hypothesis of Adam Smith is the effect of physical geography on the economic performance of a country. In his masterpiece of classical economics, Smith says coastal areas display better economic performance than inner region for their easy access to maritime trade. In a nutshell, this means "geography is important". Yet, many economists of our time neglect this hypothesis of Smith while focusing on free market-welfare approach.

In the science of economics, the question of how to encompass geography/region/space or how to adapt economics to geography has long occupied economists and regional scientists. Thus, while the other parameter "time" had its place in general equilibrium models of classical economics, geography remained in shade. In neoclassical economics, there is the assumption that enterprises as well as individuals as both producers and consumers take their decisions with the motive of profit and utility maximization in a market where all economic activities take place in a homogeneous region and under conditions of perfect competition without any information asymmetry. Challenging this assumption of neoclassical economics as "wonderland with no spatial dimensions, Walter Isard established the science of regions as a new discipline in 1954. Along with the development of this discipline and increasing need for the measurability of spatial information, there was growing interest in positivist paradigm: As a result of firms desiring to maximize their profit, the nomothetic approach of computing through numerical models spatial preferences and their effects on regional development made itself to the agenda of planners.

For a long time, these positivist models were adopted by planners as a part of the development process

of advanced countries and when these countries arrived at a specific phase there emerged the search for different paradigms as needs changed along with newly emerging problems.[10].

It will not be wrong to say that the mainstream economic theory is based on the Walrasian general equilibrium model. This model seeks to prove that under specific assumptions and conditions economic activities take place around a general equilibrium and this equilibrium is stable. The moment of market clearance when the price is set emerges as a result of instantaneous equality of supply and demand. In other words the market renews its equilibrium over and over again. By including "region" in the Walrasian general equilibrium model, Isard for the first time started a process that considers geography as well within an analytical and scientific framework acceptable to economists.

However, the smooth environment covering all countries and historical periods based on the assumption of the neoclassical economics that countries and regions at different phases of development at a given time would eventually converge became debatable in the course of time. The Solow model that emerged within neoclassical economics and emphasized the impact of technology on growth also addressed economic growth within the framework of a model of a production function. According to Barro and Sala-i Martin (1995), the sources of economic growth as the basis of improving state of welfare in a given country or region are capital accumulation and technological progress. Diminishing returns or gradual decline of capital's contribution to growth prove the development model based solely on capital accumulation invalid.[11]

According to Eser (2011), growing interest of economists in region-space derives from persisting disparities among countries and regions (there is either no convergence or it exists in very few countries and regions through different dynamics) and the fact that these disparities constitute a significant obstacle to welfare gains of countries and regions. Another reason is the role that cities and urban areas play in processes of economic growth and development.

As a result of technology driven increases in productivity and globalization of production, supply and demand have shifted to global scale and this situation brought along a change in the no space/single perfect space (in terms of supply and demand) perception of the neoclassical approach. Most salient changes include the following: Increasing returns to scale; externalities (emphasis by Romer and Lucas on rather positive externalities through information overflow as different from Marshall's both positive and negative externalities in agglomeration economies); asymmetric information (particularly about market structure-price-demand); and recognition and modelling of imperfect competition. In endogenous growth models man-information stock-quality is internalized in the production function as a production factor. Krugman's new economic geography and endogenous growth models have become an important driving force in the internalization and recognition of geography. All economic activities take place in a geographical space. According to Nobel laureate economist there are three basic reasons for studying economic geography:

(1) position/location/geography is important when economic activities are concerned,

(2) distinction between international and regional economics is gradually disappearing (together with increasing globalization of production-consumption-markets- labour force -R&D- capital movements),

(3) it provides a wide and intact laboratory of experimental research for researchers.

What basically makes Krugman's New Economic Geography, which can also be called as a "developed settlement theory", *new* is that it places increasing returns and imperfect competition within an empirically testable scientific framework that incorporates geography at an analytical level. Other features of the new economic geography that strike attention include the centre-periphery model and foreign trade models. In the New Economic Geography, the major dynamics of interaction and closing of gap between the "centres"

10 Kaygalak, İ, Bölüm 1 SANAYİ COĞRAFYASINDA BİLGİKURAMSAL YAKLAŞIMLAR içinde Türkiye'de Sanayi Kümeleri: Uşak Örneği, Doktora Tezi, İzmir, 2011(p. 1-30)

11 Eser (2011)

with their strong industrial infrastructure on the one side and the "periphery" based on primary industries on the other include the interaction between economies of scale and costs of transportation and change in the composition and nature of human resources. Externalities that lead to the creation of a centre and periphery among regions stem not only from the technological structure and level of production but are also affected by monetary externalities associated with supply and demand as well as by the process of marketization in respective regions. The interaction between regions that are industrial centres and peripheral regions where agricultural production is dominant are explained by centrifugal and centripetal forces. To give an example to the centripetal force of the centre we can speak of workers' desire to be close to producers of consumption goods (forward linkage-inducement) and the desire of producers to gather at places where market is large (backward linkage-feed in). The centrifugal force, on the other hand, is when the saturated centre pushes some demands to peripheral regions. Examples include moving away from the centre of those enterprises that require the employment of unqualified workers and heading for places where cheap labour is available.

In foreign trade models as a sub-branch of new economic geography, centre-periphery interaction is formulated by Arıcıoğlu (2011) as follows:

> "Industrial sectors focus on feed-in and inducement effects based on relations in between and with other sectors. While demand and cost linkages centripetal forces, idle production factors and the location of final demand for consumption act as centrifugal forces. The balance between these centripetal and centrifugal forces depends on the structure of relations within and between industries."[12]

This part will first expose the status of regions in national output with respect to agglomeration economies, then assess them in terms of vulnerability to middle income trap and finally conduct a sector-based analysis of regional development. In the context of sector-based analysis, two approaches are adopted to demonstrate the relationship between production and welfare on regional basis. Both of these approaches are based on sector classification of regional output.

The first approach encompasses conventional Agriculture-Industry-Services sectors and regional output analysis. By establishing the relationship between respective shares in gross value added (GVA) and population shares, it seeks to examine the welfare contribution of these three sectors.

The second approach is the one that is based on technology level. The classification on the basis of levels of technology is a newer one which allows for comparative analysis like high value added-competitive economic structure and diversifying specific policy options. It seeks to demonstrate the level of development of economic structure of respective regions. Although this method is essentially based on Rostow's stages of growth approach, it is considered as providing an original framework for assessment by using more recent works and not excluding other theories given that regions are at different levels of economic and social development.

5.3. Regions by Agglomeration Economies

Before analysing sectoral-structural analysis of regions and their status vis-a-vis middle-income trap risk in detail, it will be useful first to give regions' contribution to gross domestic product. On the basis of most recent data on GVA, gross regional output (GRO) data of regions at level-2 are estimated at current year prices (US$) for the years 2004, 2008 and 2011. GRO data were derived by using GVA shares of regions according to TÜİK data for the years 2004 and 2008. For per capita GRO values, population data (mid-year) used by the TÜİK in per capita GVA statistics were taken as reference. In calculating GRO for 2011, the regional distribution of GVA shares in 2008 is used. The table below gives GRO values obtained from these calculations.

12 Arıcıoğlu, Ebru, "İktisat Teorisinde Unutulmuş Bir Kavram: Mekan", Ekonomik Yaklaşım, Cilt 22, Sayı 81, 2011

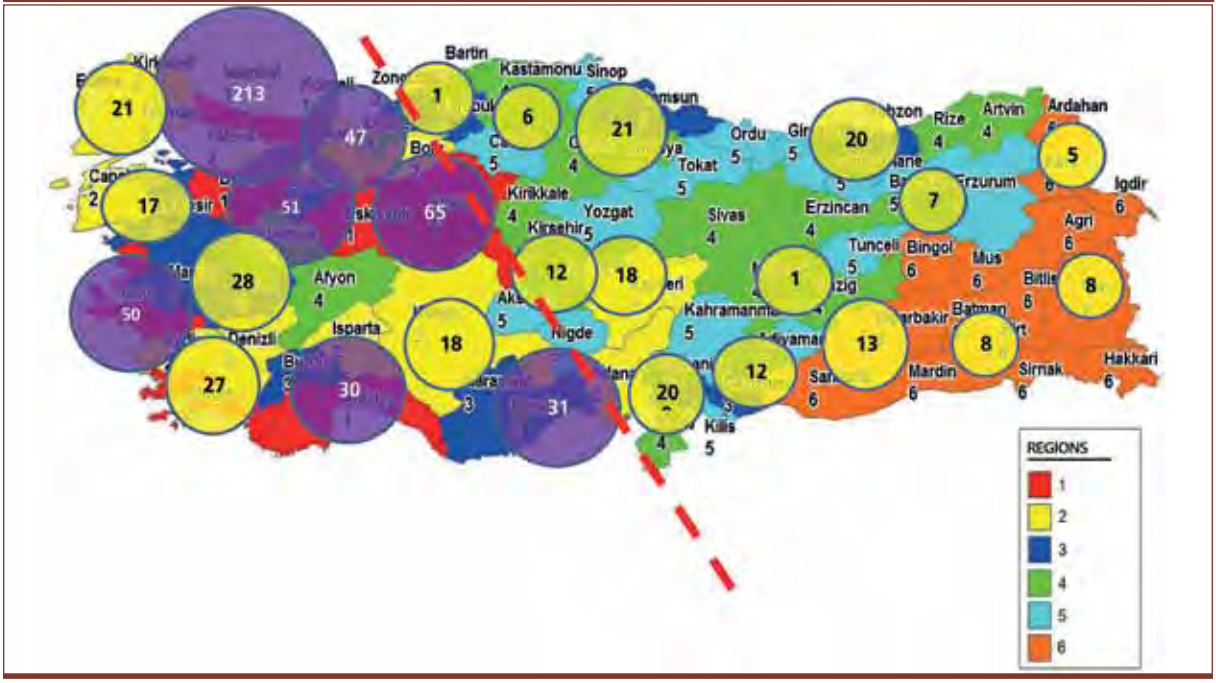
Table 19: Gross Regional Output(x 1000 $)				
Code	Region	2004	2008	2011
TR10	İstanbul	$108,430,481	$205,185,630	$213,540,645
TR51	Ankara	$32,915,996	$63,202,774	$65,776,347
TR41	Bursa, Eskişehir, Bilecik	$24,637,040	$49,209,880	$51,213,672
TR31	İzmir	$26,401,754	$48,505,424	$50,480,531
TR42	Kocaeli, Sakarya, Düzce, Bolu, Yalova	$22,837,302	$45,654,763	$47,513,793
TR62	Adana, Mersin	$15,872,985	$29,628,281	$30,834,724
TR61	Antalya, Isparta, Burdur	$15,325,568	$28,605,155	$29,769,937
TR33	Manisa, Afyon, Kütahya, Uşak	$13,568,623	$26,893,105	$27,988,173
TR32	Aydın, Denizli, Muğla	$14,951,187	$26,744,157	$27,833,161
TR83	Samsun, Tokat, Çorum, Amasya	$10,987,421	$20,962,939	$21,816,535
TR21	Tekirdağ, Edirne, Kırklareli	$9,783,777	$20,169,848	$20,991,150
TR90	Trabzon, Ordu, Giresun, Rize, Artvin, , Gümüşhane	$9,798,800	$19,624,761	$20,423,867
TR63	Hatay, Kahramanmaraş, Osmaniye	$9,495,117	$19,000,385	$19,774,067
TR52	Konya, Karaman	$9,384,685	$17,601,827	$18,318,561
TR72	Kayseri, Sivas, Yozgat	$9,293,681	$17,418,493	$18,127,762
TR22	Balıkesir, Çanakkale	$8,004,011	$16,024,417	$16,676,920
TRC2	Şanlıurfa, Diyarbakır	$7,379,908	$12,539,894	$13,050,509
TRC1	Gaziantep, Adıyaman, Kilis	$6,339,000	$11,713,671	$12,190,643
TR71	Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir	$6,037,825	$11,236,107	$11,693,634
TR81	Zonguldak, Karabük, Bartın	$5,937,480	$9,901,212	$10,304,382
TRB1	Malatya, Elazığ, Bingöl, Tunceli	$5,338,387	$9,893,149	$10,295,991
TRC3	Mardin, Batman, Şırnak, Siirt	$3,905,890	$8,253,474	$8,589,549
TRB2	Van, Muş, Bitlis, Hakkari	$3,995,233	$7,522,283	$7,828,585
TRA1	Erzurum, Erzincan, Bayburt	$3,736,116	$6,562,661	$6,829,888
TR82	Kastamonu, Çankırı, Sinop	$3,383,260	$5,461,382	$5,683,765
TRA2	Ağrı, Kars, Iğdır, Ardahan	$2,671,165	$4,565,313	$4,751,210
TR00	Turkey	$390,412,690	$742,080,982	$772,298,000

Source: Computed by the authors on the basis of TÜİK data.

The table above reflects the rapid growth experience and successful economic performance in Turkey in the 2000s. While in 2004 there were only 10 Level-2 regions above the threshold of 10 billion $ of gross regional output (GRO), this number increased to 21 as of the year 2011. Of these 21 regions 5 have GRPs with 50 billion $ and above. These regions also enjoy rather strong industrial production and attract foreign investments. There are 16 regions in the interval 10-30 billion $ while 5 regions have their GRPs under 10 billion $. In terms of their GRO levels it can be said that there are 5 developed, 16 developing and 5 underdeveloped regions. The map below shows the spatial distribution of national product.

However, the rate of increase in gross national product slowed down in the period 2008-2011 with the impact of the global crisis. Nevertheless, it is a positive sign that compared to industrialized economies of the US and EU, there was no backward turn and all regions preserved their position in terms of GRO.

Figure 13: 2011 GRO Values of Level-2 Regions (billion $)



Source: Authors' calculations.

GRO values of level-2 regions are attached on the map of region levels in the new system of incentives declared on 6 April. Drawing a line on this map extending from Zonguldak to Hatay, 601 billion $ of national product amounting to 772.3 billion $ (78%) is accounted for by 12 regions to the west of this line covering 30 provinces. The remaining part of 171.3 billion $ is by 14 eastern regions covering 51 provinces.

In 2011, four regions, namely TR10 İstanbul and TR51 Ankara, TR41 Bursa, Eskişehir, Bilecik and TR42 Kocaeli, Sakarya, Bolu, Düzce, Yalova together stand for **376 billion US$** part of total national product.

To underline the importance of this magnitude, **376 billion $** is**:**

- about the total for Finland (194 billion $) and Hungary (196 billion $),
- larger than the total for Iraq (139 billion $) and Israel (237 billion $) and
- larger than that of Greece (294 billion $), Norway (266 billion $), Romania (267 billion $), Singapore (315 billion $) and Switzerland (354 billion $).

As another agglomeration area, the triangle TR31 İzmir, TR33 Manisa, Kütahya, Afyon, Uşak and TR33 Denizli, Aydın, Muğla, contributed **115 billion $** to national product in 2011. The third agglomeration with contribution exceeding 50 billion $' is TR61 Antalya, Isparta, Burdur, TR51 Konya, Karaman and TR62 Adana, Mersin with **79 billion $**.

Against these rather pleasing developments in western regions, slow rates of growth in the east are worth noting. Leaving aside few semi-central provinces like Kayseri, Gaziantep and Kahramanmaraş presently moving forward in industrialization, too slow rates of growth and increase in welfare levels in terms of per capita income in the rest of the east of the country suggests that outmigration and many social problems associated with it will remain in the agenda. Thus, without doing any injustice to the success of our rapidly developing and competitive regions that are integrated with the rest of the world, developing different development prescriptions for slowly developing and backward regions is a must for Turkey on her way towards "Vision 2023".

At this point it will be appropriate to seek answer to the question "which Turkey?" on the basis of per capita gross regional output as the oldest and basic welfare indicator in terms of middle-income trap.

5.4. Per Capita Gross Regional Output (pcGRO) Development Trend

Production of statistics and data is still an important problem for Turkey as a country putting ambitions targets for the year 2023. The very early Input-output tables developed in 1960 by Uğur Korum, then a postgraduate student, had their significant place in analyses of the first planned development period led with Tinbergen, the first economist awarded Nobel, as advisor. Back in those periods input-output tables could be renewed in every 4-5 years. In 2012, however, the most recent tables date back to 2002. While regional, multi-sector and interregional input-output tables are presently used as important tools in development planning by developed and rapidly developing countries, it is a daunting problem for economic policy researchers in Turkey that there are no input-output tables produced and that a different statistical classification is adopted at each attempt to produce nationwide tables. "You cannot manage if you cannot measure and you cannot reach success if you cannot manage."

Analyses in this part are based on gross regional value added statistics for the period 2004-2008 though they are old and with weak scale. The most recent data for measuring regional economies are 5 years old. In spite of all these constraints, we envisage engaging in structural analysis of regions as far as possible.

In calculating per capita gross regional output of 26 level-2 regions for the years 2004, 2008 and 2011, proportions in the regional distribution of gross value added (GVA) were used and it was assumed that the proportion in 2008 remained the same in 2011. In other words, 2008 GVA proportions were taken as basis while national output in 2011 was reduced to regional level. The regional distribution of per capita GRO values is given in the table below.

Table 20: Per Capita Gross Regional Output(US $ in current year prices)

	Region	2004	2008	2011
TR10	İstanbul	$8,974	$16,160	$15,674
TR42	Kocaeli, Sakarya, Düzce, Bolu, Yalova	$8,115	$14,556	$14,331
TR41	Bursa, Eskişehir, Bilecik	$7,828	$14,293	$14,080
TR51	Ankara	$7,883	$13,894	$13,449
TR21	Tekirdağ, Edirne, Kırklareli	$7,117	$13,425	$13,375
TR31	İzmir	$7,454	$12,778	$12,731
TR61	Antalya, Isparta, Burdur	$6,833	$11,378	$11,004
TR00	Turkey	$5,764	$10,376	$10,335
TR22	Balıkesir, Çanakkale	$5,100	$9,984	$10,164
TR81	Zonguldak, Karabük, Bartın	$5,884	$9,700	$10,108
TR32	Aydın, Denizli, Muğla	$6,010	$9,999	$10,013
TR33	Manisa, Afyon, Kütahya, Uşak	$4,567	$9,229	$9,511
TR62	Adana, Mersin	$4,592	$8,164	$8,164
TR90	Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane	$4,004	$7,827	$8,127
TR52	Konya, Karaman	$4,392	$8,001	$8,061
TR83	Samsun, Tokat, Çorum, Amasya	$4,010	$7,707	$8,028
TR71	Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir	$4,151	$7,527	$7,819
TR72	Kayseri, Sivas, Yozgat	$4,106	$7,574	$7,720
TR82	Kastamonu, Çankırı, Sinop	$4,721	$7,407	$7,681
TR63	Hatay, Kahramanmaraş, Osmaniye	$3,564	$6,535	$6,561
TRA1	Erzurum, Erzincan, Bayburt	$3,361	$6,184	$6,366
TRB1	Malatya, Elazığ, Bingöl, Tunceli	$3,408	$6,092	$6,188
TRC1	Gaziantep, Adıyaman, Kilis	$3,025	$5,053	$4,932
TRC3	Mardin, Batman, Şırnak, Siirt	$2,093	$4,199	$4,176
TRA2	Ağrı, Kars, Iğdır, Ardahan	$2,314	$4,003	$4,105
TRC2	Şanlıurfa, Diyarbakır	$2,685	$4,089	$3,970
TRB2	Van, Muş, Bitlis, Hakkari	$2,121	$3,772	$3,826

Source: Computed by the author on the basis of TÜlK data.

According to GRO estimates for the years 2004, 2008 and 2011, per capita income in TR10 İstanbul region was $8,974 in 2004. After 8 years, this figure has almost doubled to reach $15,674 as of the end of 2011. The average per capita income for the country increased from $5,764 to $10,335 in the same period.

Under the impact of the global crisis, there is stagnating per capita GRO in the period 2008-2011 for Turkey in general and also for individual regions. Though not very significant, all developed or above-average regions of Turkey, namely TR10 İstanbul, TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova, TR41 Bursa, Eskişehir, Bilecik, TR51 Ankara, TR21 Tekirdağ, Edirne, Kırklareli, TR31 Izmir and TR61 Antalya, Isparta, Burdur experienced decline in their per capita GRO values in this period. The main reason is the fact that these centres and semi-centres characterized by in-migration and intensive economic activities have limited capacity in terms of creating employment.

5.5. Classification of Regions in Terms of Middle-Income Trap

There is no clear definition of middle-income trap that is agreed upon. In their work covering 124 countries, Felipe et al. (2012) used the following classification: Low income countries where per capita GDP is less than 2,000$; middle-low income countries with per capita GDP within the range 2,000-7,250$; middle-high income group with GDP 7,250-11,250$ and high income countries with per capita GDP higher than 11,250$. However the classification of Felipe et al. (2012) covers 124 countries most of which are underdeveloped countries in southern hemisphere and gap between income groups in terms of per capita income is kept narrower. Thus it can be inferred that this work gives a more "optimistic" picture than works of other researchers.

Table 21: Proportion of Regional Per Capita Incomes in Turkey to Per Capita Income in the US (%)

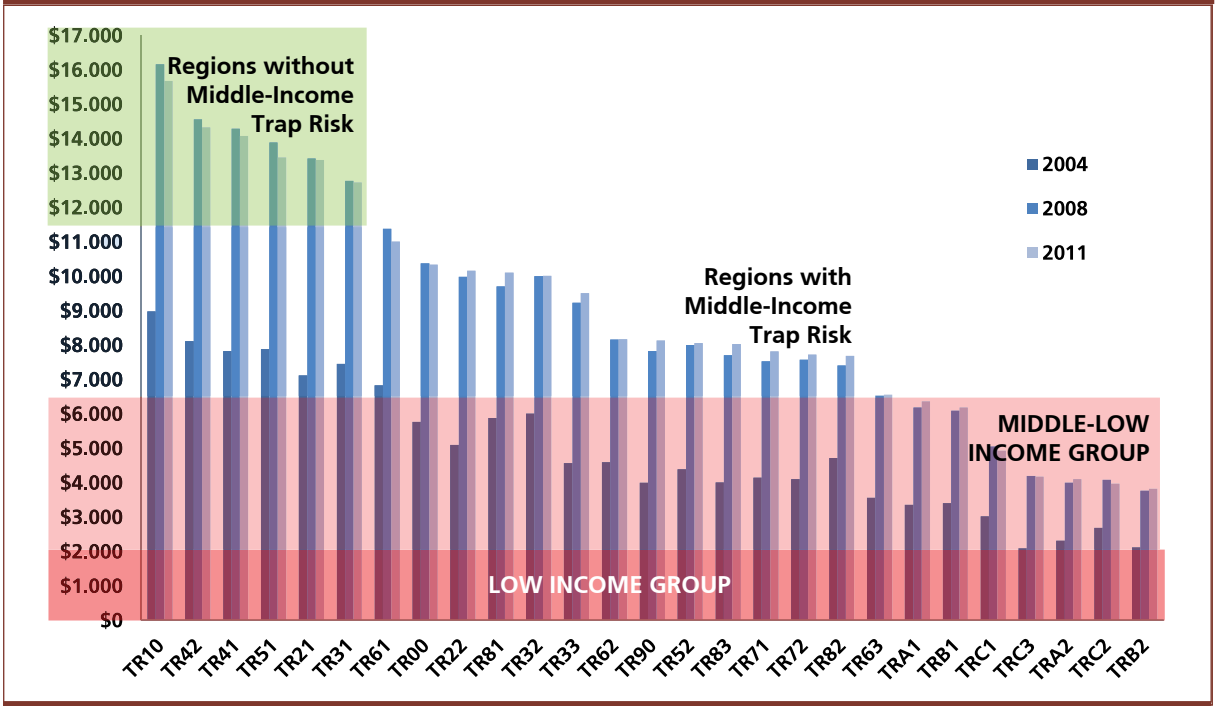
Region Code	Regions	2004	2008	2011	2011-2004 difference
TR10	İstanbul	22.29%	34.59%	38.93%	16.64%
TR42	Kocaeli, Sakarya, Düzce, Bolu, Yalova	20.16%	31.16%	35.60%	15.44%
TR41	Bursa, Eskişehir, Bilecik	19.44%	30.60%	34.97%	15.53%
TR51	Ankara	19.58%	29.74%	33.41%	13.82%
TR21	Tekirdağ, Edirne, Kırklareli	17.68%	28.74%	33.22%	15.54%
TR31	İzmir	18.51%	27.35%	31.62%	13.11%
TR61	Antalya, Isparta, Burdur	16.97%	24.35%	27.33%	10.36%
TR00	Turkey	14.32%	22.21%	25.67%	11.35%
TR22	Balıkesir, Çanakkale	12.67%	21.37%	25.25%	12.58%
TR81	Zonguldak, Karabük, Bartın	14.62%	20.76%	25.11%	10.49%
TR32	Aydın, Denizli, Muğla	14.93%	21.40%	24.87%	9.94%
TR33	Manisa, Afyon, Kütahya, Uşak	11.34%	19.75%	23.62%	12.28%
TR62	Adana, Mersin	11.41%	17.48%	20.28%	8.87%
TR90	Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane	9.95%	16.75%	20.19%	10.24%
TR52	Konya, Karaman	10.91%	17.13%	20.02%	9.11%
TR83	Samsun, Tokat, Çorum, Amasya	9.96%	16.50%	19.94%	9.98%
TR71	Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir	10.31%	16.11%	19.42%	9.11%
TR72	Kayseri, Sivas, Yozgat	10.20%	16.21%	19.18%	8.98%
TR82	Kastamonu, Çankırı, Sinop	11.73%	15.86%	19.08%	7.35%
TR63	Hatay, Kahramanmaraş, Osmaniye	8.85%	13.99%	16.30%	7.44%
TRA1	Erzurum, Erzincan, Bayburt	8.35%	13.24%	15.81%	7.47%
TRB1	Malatya, Elazığ, Bingöl, Tunceli	8.47%	13.04%	15.37%	6.91%
TRC1	Gaziantep, Adıyaman, Kilis	7.51%	10.82%	12.25%	4.73%
TRC3	Mardin, Batman, Şırnak, Siirt	5.20%	8.99%	10.37%	5.17%
TRA2	Ağrı, Kars, Iğdır, Ardahan	5.75%	8.57%	10.20%	4.45%
TRC2	Şanlıurfa, Diyarbakır	6.67%	8.75%	9.86%	3.19%
TRB2	Van, Muş, Bitlis, Hakkari	5.27%	8.07%	9.50%	4.24%

Source: Author's computations

In assessing regions' status in terms of middle-income trap, the criterion "58% of the national income of the US" as suggested by Eichengreen et al. (2011) can be used. In this vein, per capita incomes of regions in Turkey were calculated in proportion to US per capita income in ABD 2004, 2008 and 2010 and resulting income groups of regions are given below.

As the Table shows, the proportion of per capita incomes to per capita income in the US has strikingly increased in all regions in the period 2004-2008 and the distance in-between has become considerably smaller. However, the rate of increase slowed down in the period 2008-2011 with the impact of the global crisis. According to the table above, regions can be classified as those with per capita income exceeding 30% of that in the US, those in the interval 29-189% and others. Following this approach, regional groups are presented in the chart below in terms of middle-income trap.

Figure 14: Classification of Regions by Income Groups (2004, 2008, 2011)



Source: Authors' computations.

As can be seen in the chart above regions are classified as follows as of 2011:

(i) 6 regions immune from the middle-income trap risk:
TR10 İstanbul,
TR42 Kocaeli, Sakarya, Bolu, Düzce, Yalova,
TR41 Bursa, Eskişehir, Bilecik,
TR51 Ankara,
TR21 Tekirdağ, Edirne, Kırklareli
TR31 İzmir,

(ii) 12 regions with Middle-Income Trap risk:
TR61 Antalya, Isparta, Burdur,
TR22 Balıkesir, Çanakkale,
TR81 Zonguldak, Karabük, Bartın,
TR32 Aydın, Denizli, Muğla,
TR33 Manisa, Afyon, Kütahya, Uşak,
TR62 Adana, Mersin,
TR90 Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane,

TR52 Konya, Karaman,
TR83 Samsun, Tokat, Çorum, Amasya,
TR71 Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir,
TR72 Kayseri, Sivas, Yozgat,
TR82 Kastamonu, Çankırı, Sinop

(iii) 8 regions in Middle-Low Income Group:
TR63 Hatay, Kahramanmaraş, Osmaniye
TRA1 Erzurum, Erzincan, Bayburt
TRB1 Malatya, Elazığ, Bingöl, Tunceli
TRC1 Gaziantep, Adıyaman, Kilis
TRC3 Mardin, Batman, Şırnak, Siirt
TRA2 Ağrı, Kars, Iğdır, Ardahan
TRC2 Şanlıurfa, Diyarbakır
TRB2 Van, Muş, Bitlis, Hakkari.

The country average fits the group of regions facing middle income risk. Taking 2004 as basis, 12 out of 22 regions of Turkey in the Middle-Low Income group jumped to the higher group as of the end of 2011 while 2 of them jumping higher to the first group immune from the middle-income trap. In 2004, TR10 İstanbul, TR42 Kocaeli, Sakarya, Bolu, Düzce, Yalova, TR41 Bursa, Eskişehir, Bilecik and TR51 which used to be in the group facing the risk moved to the first group in 2004. 8 regions that were in the Middle-Low income group in 2004 could not alter their groups despite significant increases in their per capita GRO values.

After giving the general framework, it will be rewarding to analyze the sectoral structure of regions over the classical model of agriculture, industry, services and technology levels in order to investigate the causes of this overall picture. Apart from this, detailed examination of inter-regional population movements and qualification of labour force was seen as necessary in order to understand better the impact of the process of sectoral and technological change on "human beings" and "welfare". For the variety of analyses, it can be said that there is the dominant influence of Economic Geography approach. On the same context, another area worth investigating is transportation infrastructure at regional level in terms of sectoral-technological and population trends.

5.6. Analysis of the Regions in Terms of Agriculture-Industry and Services Sectors

The most recent data by the Institute of Statistics concerning the economic structure of regions include Gross Value Added data for 2003 and 2004-2008 and labour statistics. There is no province-level data on such most fundamental economic indicators as inflation and unemployment rates, Gross Regional Output, total supply and levels of production by sectors. Even available data lack time series needed for scientific analysis since they are not produced regularly. Although analyses in this part were made under these constraints, they still give hints about the rapid process of transformation that Turkey experienced in the period in comparative regional terms for the years 2003 and 2008.

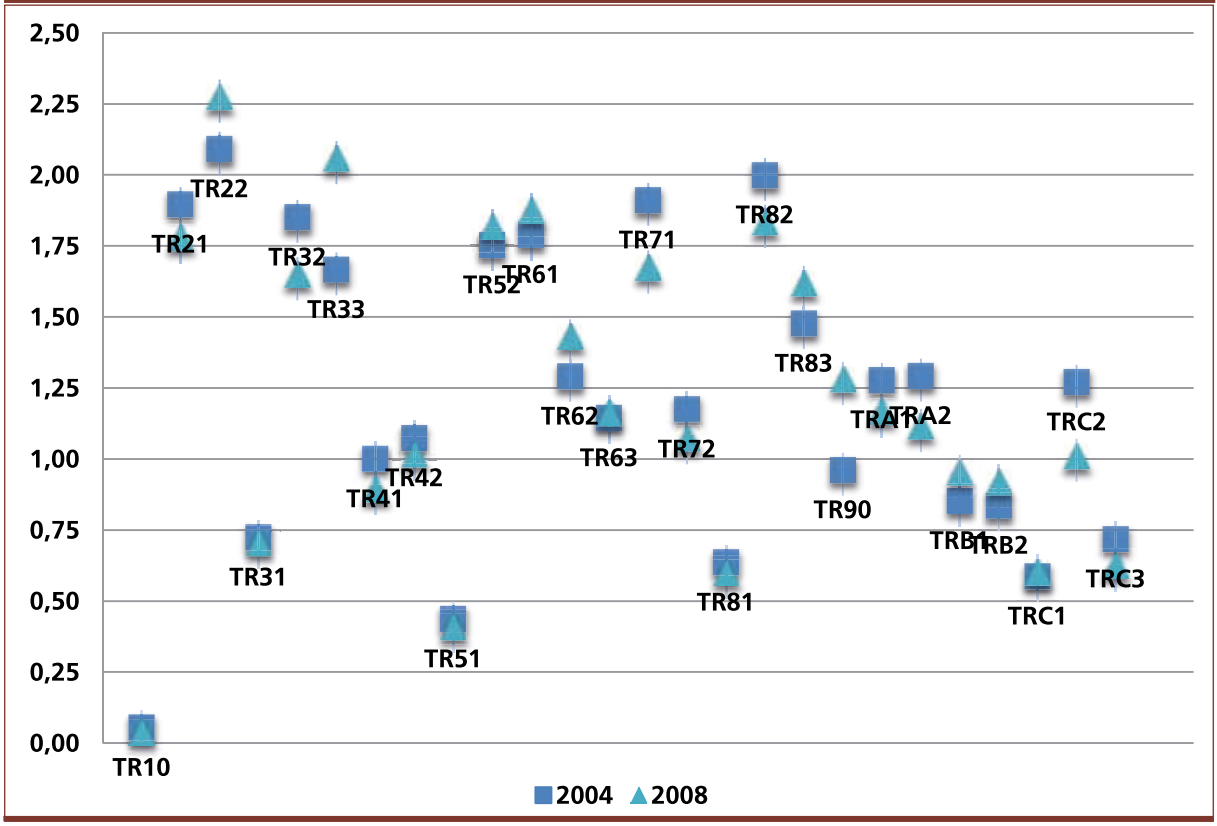
Through the first method of analysis, the following sector-based charts were obtained for sector-based gross value added shares of regions with respect to population.

5-6-1. Regional Composition of Agricultural Value Added

The regions where the ratio of the share of agricultural GVA to population is the highest include TR22 (Balıkesir, Çanakkale), TR33 (Manisa, Afyon, Kütahya, Uşak), TR61 (Antalya, Isparta, Burdur), TR82 (Kastamonu, Çankırı, Sinop) and TR52 (Konya, Karaman). It is interesting that all these regions are in the west and all, with the exception of TR52 (Kastamonu, Çankırı, Sinop) enjoyed productivity-driven increases in the period 2004-2008. This fact seems to confirm the observation in the relevant literature that "in industrialized and economically developed regions, the level of agricultural output and productivity too

is higher than in backward regions." [13] It is because industrialization and urban transformation in a given region constitute a significant hope for solving the problem of low agricultural productivity.

Figure 15: Ratio of Agricultural Value Added to Population by Regions (%)



Source: Our own computations on the basis of TÜİK data.
Note: A ratio equalling to 1.00 indicates that the region gets a fair share from value added.

At the top of the list of regions with lowest proportions of agricultural value added to total population we see TR10 (İstanbul) which has an economy almost entirely based on industry and services. İstanbul is followed by TR51 (Ankara) with the weight of services sector. TR81 (Zonguldak, Karabük, Bartın) region ranks third with its large industrial enterprises as well as relatively large share of elderly-depended population. Eastern provinces where rural population is dominant appear at the bottom of this list. This fact contradicts the general discourse that the "economies of these regions are based on agriculture." In fact, these regions face the problem of marketization; agricultural production is for mere subsistence rather than being an economic activity in proper sense and they are supported by some social transfer mechanisms.

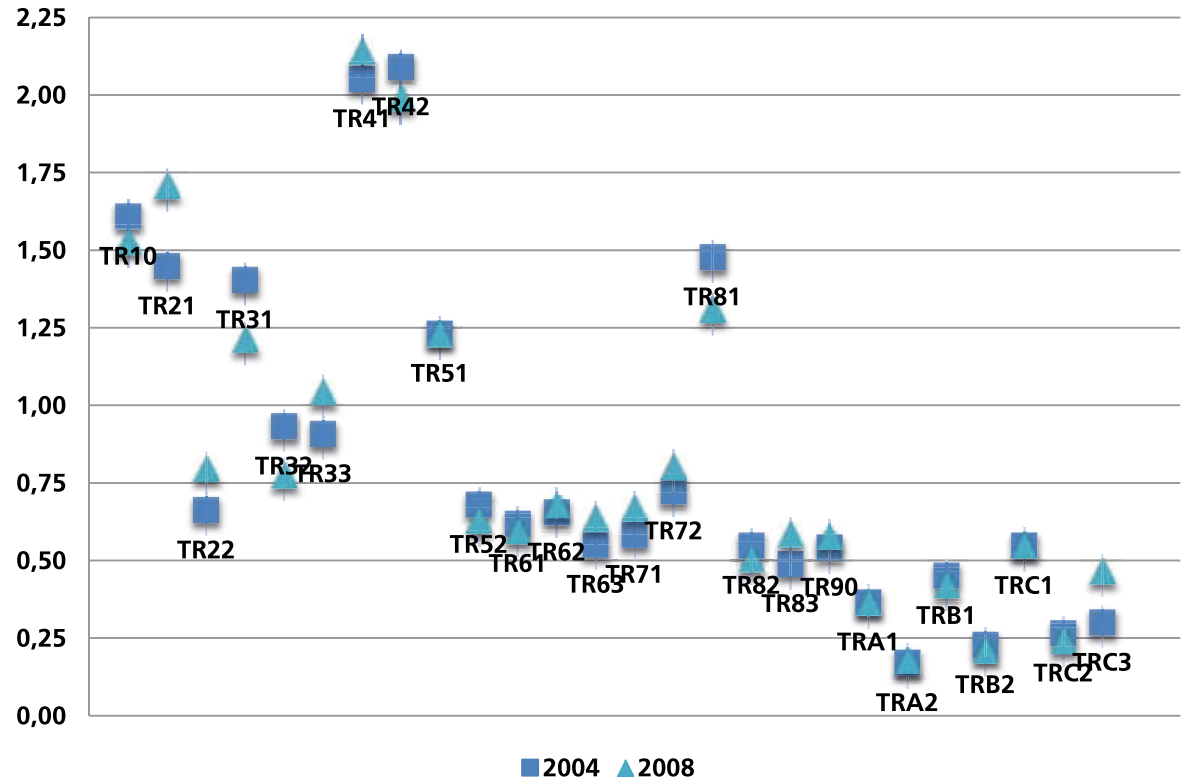
5.6.2. Regional Composition of Value Added in Industry

The regions where industrial produce per population is high are as follows: TR41 Bursa, Eskişehir, Bilecik, TR42 Kocaeli, Sakarya, Yalova, Bolu, Düzce and TR21 Tekirdağ, Kırklareli, Edirne. In addition to their internal development dynamics, this position of regions mentioned also derive from their geographical proximity to TR10 İstanbul region, which contributes 213 billion $ to national economy as of the end of 2011 and which has a foreign trade volume of 181 billion $.

It is clear from 2004 and 2008 figures on TR21 Tekirdağ, Kırklareli, Edirne region that what Krugman calls "agglomeration effects" is specifically valid for this region. The set back that TR10 İstanbul region faced in this period suggests that the region has already reached its limits in terms of existing industrial infrastructure and consequently it dispatches additional-excess demand to nearby regions.

13 Nicholls, William H., "Industrialization and Agricultural Development",

Figure 16: Industrial Sector Value Added Share/ Total Population Share of Regions (%)



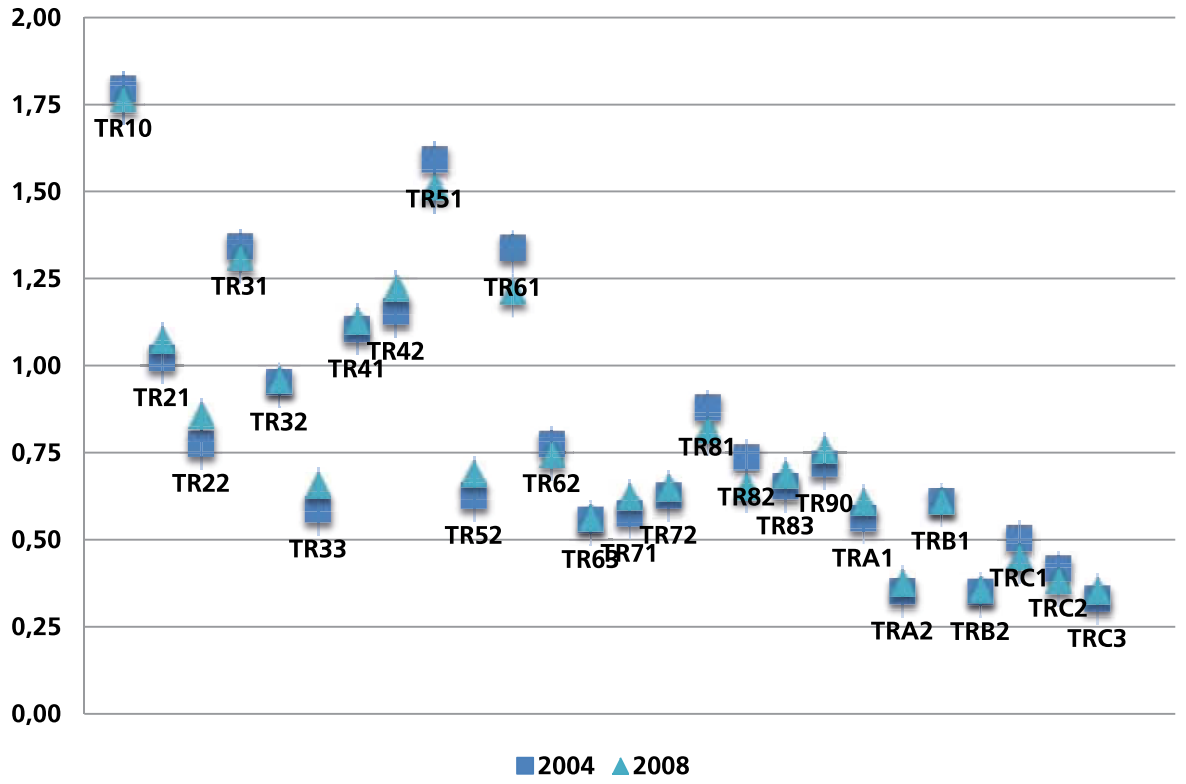
Source: Our own computations on the basis of TÜİK data.
Note: A ratio equalling to 1 indicates that the region gets a fair share from value added.

For the same period, we see a backward trend in TR31 İzmir region while TR51 Ankara region maintained its position. As far as industrialization is concerned, 6 regions at the bottom of ranking are from the underdeveloped eastern triangle which appears at level 6 in the new system of incentives.

5.6-3. Regional Composition of Value Added in Services Sector

In respect to services sector, the region contributing most to local welfare is TR10 İstanbul region. İstanbul is followed by TR51 Ankara where the number of public employees is relatively high and TR31 İzmir. Hence the table is as follows: TR10 İstanbul as the "national economic centre" of Turkey with an economy of 772.3 billion$; TR51 Ankara as "public centre" producing policies and wisdom with its public sector institutions, strong university-research centres, advanced technological infrastructure and qualified human resources and finally TR31 İzmir as a trade centre preserving its historical position with its foundations for foreign trade and industry.

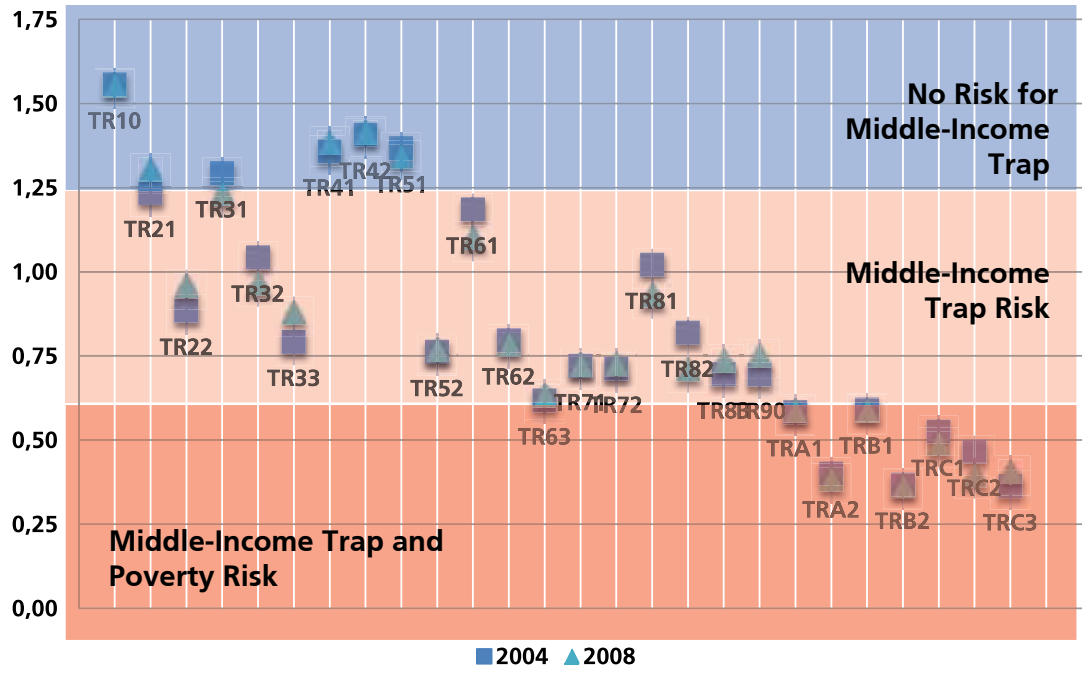
Figure 17: Ratio of Services Value Added to Population by Region (%)



Source: Our own computations on the basis of TÜİK data.
Note: A ratio equalling to 1 indicates that the region gets a fair share from value added.

In highly industrialized TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova region too, shift to services, although slightly, may be seen as transition to supplementary services as a result of saturation in industrial sector. As in the case of industry, it is the eastern and south-eastern regions where the contribution of services sector to regional welfare is very limited.

Figure 18: Changes in the Ratios of Regional Agricultural and Services Value Added to Population



Source: Authors' computations on the basis of TÜİK data.

The sector-wise production composition of a region is one of the most important factors affecting the income level of that region. Overall, the general trend is that, as regions engage in industrial production after subsistence level agricultural activities, services starts ascending to the forefront after a specific level of industrialization is attained. Of course, all these 3 sectors keep operating in any region and even in countries using high technology the sector of agriculture can still maintain its place as a significant source of income. What makes importance here is the level of productivity in respective sectors. In Turkey, agricultural production mainly takes place in regions with low levels of urbanization for not being able to move from subsistence economy to sector-based production based on market mechanisms. In cities which are regional centres of attraction, services sector gradually takes the place of agricultural production while expected improvement in the level of industrialization does not occur.

The Level-2 TR10 (İstanbul) is the region where the per capita value added in agriculture is the lowest. The services sector makes up 75% of all economic activities in this region. The share of industry in total value added is gradually declining. While industry accounted for 29% of GVA in İstanbul in 2004, this share dropped to 26.7% in 2008. Parallel to this, industrial employment is shrinking while employment in the sector of services is growing. In this period, the share of industry in total employment dropped from 42% to 38%. In İstanbul, per capita GVA in all three sectors is falling. These figures, however, do not indicate that İstanbul is economically receding; they suggest that sector wise weights of other regions in national economy are increasing.

Similar to the case in İstanbul, per capita value added in three sectors is also falling in the Level-2 Region TR51 (Ankara). While declines in the weights of agriculture and industry are only marginal in this region, decline in the weight of services is larger. Nevertheless, Ankara is still the second after İstanbul in terms of the weight of services sector. Coming to TR31 (İzmir) Level-2 region, there is no significant change in the weight of agriculture while these is significant fall in that of industry. Indeed, while the per capita value added value in İzmir region was 1.4 in 2004 it dropped to 1.2 in 2008. 10 percentage points fall in industrial employment in this period could not be balanced by growing employment in services sector.

The regions where per capita value added in agriculture are the highest include the Level-2 regions TR22 (Balıkesir, Çanakkale), TR33 (Manisa, Afyon, Kütahya, Uşak) and TR61 (Antalya, Isparta, Burdur). All three regions recorded progress in agricultural production in this five-year period. While agricultural employment is shrinking in TR22 and TR33 regions, it is on the rise in TR61. Unlike the case in other regions, increase in employment moves to agriculture rather than services sector in this specific region. Following these three regions, we have the region TR82 (Kastamonu, Çankırı, Sinop) in terms of intensity of agricultural activities. However, this region started losing its weight in agricultural production while not being able to increase its weight in the remaining two sectors.

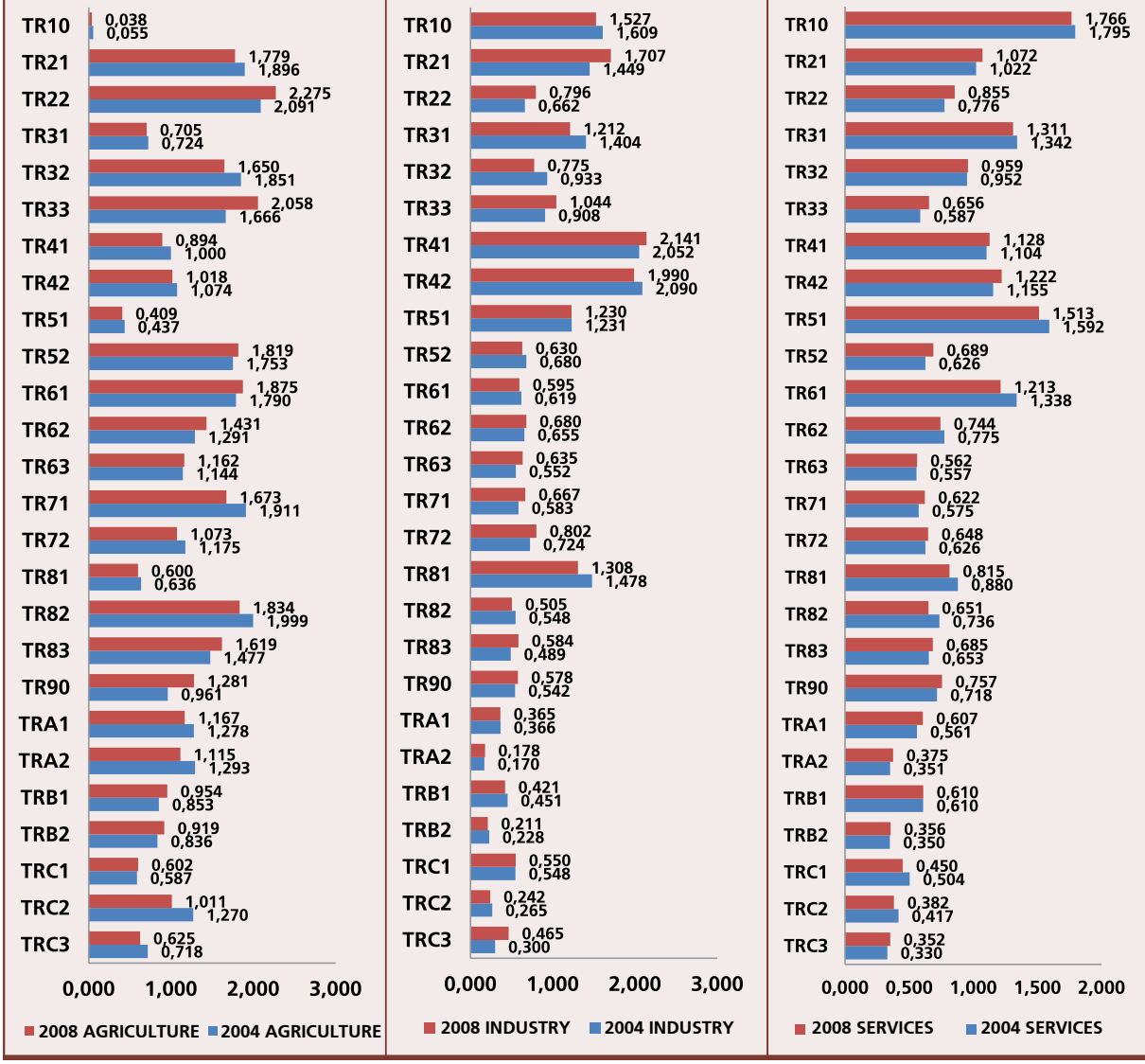
The regions of Eastern and South-eastern Anatolia where the share of agriculture in GVA is high do not appear among the top ten Level-2 regions in terms of per capita value added. For example, the Level-2 region TRA2 (Ağrı, Kars, Iğdır, Ardahan) where e the share of agriculture in total employment is above 60% is only 14th in this ranking. The Level-2 Region TRC2 (Şanlıurfa, Diyarbakır) where the GAP is being implemented ranks 17th, TRC1 (Gaziantep, Adıyaman, Kilis) 23rd and TRC3 (Mardin, Batman, Şırnak, Siirt) 22nd.

The Level-2 regions TR42 (Kocaeli, Sakarya, Düzce, Bolu, Yalova), TR41 (Bursa, Eskişehir, Bilecik) and TR10 (İstanbul) are the regions where per capita value added in industry is the highest. The sector of industry in Turkey is in conglomeration in İstanbul and its hinterland. North-eastern Anatolia covers regions where the level of industrialization is the lowest. In the services sector, Level-2 regions where urban centres are lead the list while the weight of South-eastern Anatolia is very low.

5.7. Middle-Income Trap Risk Assessment of Regions for Sectors of Agriculture-Industry-Services

In this section, regions are assessed comparatively with respect to the sectors of agriculture, industry and services as conventionally used in sectoral analyses on a given economy. There is need for a consolidated table to establish the relationship of these three sectors and regions with the middle-income trap.

Figure 19: Method of Computing Level of Technology



Source: Our own computations on the basis of TÜİK data.
Note: A ratio equalling to 1 indicates that the region gets a fair share from value added

Table 22: Middle-Income Trap Risk Assessment of Regions for Sectors of Agriculture-Industry-Services

Region		Agriculture Rank		Industry Rank		Services Rank		GVA per head ($)		Income group	Middle-Income Trap Risk
		2004	2008	2004	2008	2004	2008	2004	2008		
TRB2	Van, Muş, Bitlis, Hakkari	20	19	25	25	25	25	$2.121	$3.772	Medium-Low	Yes
TRA2	Ağrı, Kars, Iğdır, Ardahan	10	14	26	26	24	24	$2.314	$4.003	Medium-Low	Yes
TRC2	Şanlıurfa, Diyarbakır	13	17	24	24	23	23	$2.685	$4.089	Medium-Low	Yes
TRC3	Mardin, Batman, Şırnak, Siirt	22	22	23	21	26	26	$2.093	$4.199	Medium-Low	Yes
TRC1	Gaziantep, Adıyaman, Kilis	24	23	18	19	22	22	$3.025	$5.053	Medium-Low	Yes
TRB1	Malatya, Elazığ, Bingöl, Tunceli	19	18	21	22	17	19	$3.408	$6.092	Medium-Low	Yes
TRA1	Erzurum, Erzincan, Bayburt	12	12	22	23	20	20	$3.361	$6.184	Medium-Low	Yes
TR63	Hatay, Kahramanmaraş, Osmaniye	15	13	16	14	21	21	$3.564	$6.535	Medium-Low	Yes
TR82	Kastamonu, Çankırı, Sinop	2	4	17	20	12	16	$4.721	$7.407	Medium-High	Yes
TR71	Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir	3	7	15	13	19	18	$4.151	$7.527	Medium-High	Yes
TR72	Kayseri, Sivas, Yozgat	14	15	10	9	15	17	$4.106	$7.574	Medium-High	Yes
TR83	Samsun, Tokat, Çorum, Amasya	9	9	20	17	14	14	$4.010	$7.707	Medium-High	Yes
TR90	Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane	18	11	19	18	13	11	$4.004	$7.827	Medium-High	Yes
TR52	Konya, Karaman	7	5	11	15	16	13	$4.392	$8.001	Medium-High	Yes
TR62	Adana, Mersin	11	10	13	12	11	12	$4.592	$8.164	Medium-High	Yes
TR33	Manisa, Afyon, Kütahya, Uşak	8	2	9	8	18	15	$4.567	$9.229	Medium-High	Yes
TR81	Zonguldak, Karabük, Bartın	23	24	4	5	9	10	$5.884	$9.700	Medium-High	Yes
TR22	Balıkesir, Çanakkale	1	1	12	10	10	9	$5.100	$9.984	Medium-High	Yes
TR32	Aydın, Denizli, Muğla	5	8	8	11	8	8	$6.010	$9.999	Medium-High	Yes
TR61	Antalya, Isparta, Burdur	6	3	14	16	4	5	$6.833	$11.378	Medium-High	Yes
TR31	İzmir	21	21	6	7	3	3	$7.454	$12.778	High	No
TR21	Tekirdağ, Edirne, Kırklareli	4	6	5	3	7	7	$7.117	$13.425	High	No
TR51	Ankara	25	25	7	6	2	2	$7.883	$13.894	High	No
TR41	Bursa, Eskişehir, Bilecik	17	20	2	1	6	6	$7.828	$14.293	High	No
TR42	Kocaeli, Sakarya, Düzce, Bolu, Yalova	16	16	1	2	5	4	$8.115	$14.556	High	No
TR10	İstanbul	26	26	3	4	1	1	$8.974	$16.160	High	No

Source: Our own computations on the basis of TÜİK data.

The table above gives the sector-based GVA ranking of Level-2 regions and per capita GO values. According to this, Level-2 TR10 (İstanbul), TR21 (Tekirdağ, Edirne, Kırklareli), TR41 (Bursa, Eskişehir, Bilecik), TR42 (Kocaeli, Sakarya, Düzce, Bolu, Yalova), TR31 (İzmir) and TR51 (Ankara) regions are immune from the middle-income trap risk. These regions brought their income levels above 10,000 $ in a five-year period.

The GVA share of agriculture in these regions is decreasing and there in concentration in services sector. Also increasing are the rates of employment in sectors other than agriculture. While the Level-2 regions TR61 (Antalya, Isparta, Burdur), TR22 (Balıkesir, Çanakkale) and TR33 (Manisa, Afyon, Kütahya, Uşak) have attained middle-high income level, relatively high rates of employment in agriculture suggests doubts about definitive exit from the middle-income trap. The dependence of TR61 (Antalya, Isparta, Burdur) region to a rather fragile services sector (tourism) and agriculture which is closely affected by natural environment, and high rate of agricultural employment as well as the fact that industry has yet not reached maturity in the level-2 regions including Konya, Kayseri, Adana, Mersin, Gaziantep and Denizli provinces suggest that it will take some time for them to leave the middle-income level behind.

6. ANALYSIS OF TECHNOLOGY LEVELS IN REGIONS IN TERMS OF MIDDLE-INCOME TRAP

6. ANALYSIS OF TECHNOLOGY LEVELS IN REGIONS IN TERMS OF MIDDLE-INCOME TRAP

6.1. Identification of Technology Levels of Production Structures in Regions

It must be clear that analysing per capita income values alone would not be enough in properly assessing the middle-income trap risk. The causes of this risk are immanent in economies of countries and regions. Hence, it will be appropriate to analyze in detail the economies of different regions in Turkey. By "analyzing in detail" we refer to examining production, labour force and financial markets included in the periodic flow chart of economies together with their interactions as well as their relations with the rest of the world (i.e. imports-exports with respect to production of goods and services; migratory flows with respect to labour force and direct-indirect foreign investments with respect to the financial market). Since it directly affects per capita incomes, analysing the composition of production is considered as sufficient as the first stage in this part. Considering the regional production design in Turkey, salary and wage payments is the major factor that affects the level of individual welfare. In the earlier part, we conducted an analysis of regions-sectors and individual welfare in terms of main sectors as agriculture, industry and services. In this section we are going to examine the levels of technology of production structures in 26 Level-2 regions also by making use of the theoretical framework given in regard to the level of development of respective regions.

The approach adopted to identify the levels of technology is an index based on sector wise aggregation of technology levels of regions, which itself derives from TÜİK's Regional-Annual Business Statistics covering the period 2003-2008. Under this index, regions or countries are assigned values ranging from 1 to 5. Although this method is based on Rostow's approach to stages in development, it is still an original framework of assessment that makes use of other more recent works in this field.

To be more specific, these works include Ohno's (2009) "Stages of Catching-up Industrialization" approach included in his work "Avoiding the Middle Income Trap" for ASEAN countries and Taşcı's (2009) "phases of development" that is used for assessing the level of technology in foreign trade of Turkey for the period 1996-2009. It will be useful to recall the following points in establishing the relationship between the middle-income trap and technology levels of regions:

According to Öz (2012), *"for a country to reach middle income level, it should have the capacity to produce on low technology, and labour-intensive production should be dominant in its manufacturing industry. The competitiveness of this manufacturing industry in international markets is another precondition for reaching middle income level."*[14]

Agénor et al.(2012) outlines the process in which a country or region gets caught in the Middle-Income Trap as follows:

- When countries transfer from low to middle income group, labour force shifts from agriculture to labour-intensive and low-cost sectors in manufacturing industry.
- This economy experiencing a delayed development process ensures increases in labour productivity by using imported technologies and, labour force in agriculture shifts to manufacturing industry.
- After a certain period, the possibilities for the pool of unqualified labour to transfer to other sectors shrink as employment in this area reaches its peak and employment creating capacity of economy gets weaker.

14 Öz, Sumru "Orta Gelir Tuzağı", Ekonomik Araştırma Forumu Politika Notu 12-06, August 2012

- When countries and regions in this group reach middle-income level, real wages in urban manufacturing industries rise, labour costs increase and competitive power of producers diminish together with returns to imported foreign technology.
- Increases in productivity hitherto obtained through the composition of production, sector wise changes and imported technology wanes, international competitiveness starts melting down, economic growth and increase in total output slows down and the economy finds itself in the middle-income trap. As a result of this spiral, no transition to the higher income group takes place.

The taxonomy developed for the present study introduces a 5-level classification with respect to regions' levels of development based on the intensity of technology y in their leading economic sectors.

6.1.1. First Level

In a region or country at this level, primary industries based on resources drawn directly from natural environment have their weight in gross regional product. This phase represents a rather new transition from subsistence economy to economic activities in the sectors of agriculture, forestry and mining. Capital accumulation is slow and labour force is of low quality. According to Akpınar, Özsan and Taşcı (2012)[15], activities that are statistically incorporated into agriculture are in fact daily subsistence activities of individuals far from any logic of an economic sector.

For any activity to be considered within an economic sector, first of all it is necessary that those engaged in production activities are entrepreneurs; in other words, persons who are engaged in that activity with a profit motive. Agricultural activities carried out in underdeveloped regions of Turkey are, on the other hand, nothing more than maintaining some inherited economic activities. In many cases, agricultural production is not an activity that individuals choose in informed manner. Production activity is short of dynamics that would lead to sector-based specialization and division of labour. Individuals working in the sector mainly do so in order to provide for their own needs, but the motive of producing goods and services for the market is flourishing.

The level of agricultural productivity is low in these regions. Economic structure is dependent on a single crop or sector, subsidies and various mechanisms of support and consumption expenditures by public employees, security people, and students etc. who are from other regions. These are peripheral regions dependent to other semi-central regions or national centres.

6.1.2. Second Level

In this type of regions the weight rests with low-technology sectors in manufacturing industry. "Agglomeration economies" as the characteristic of this level refers to the concentration of manufacturing industry enterprises in specific geographical areas in order to attain economies of scale and benefit from externalities.

According to Agenor et al. (2012), when countries transfer from low to middle income group labour force shifts from agriculture to labour-intensive and low-cost sectors of manufacturing industry. Manufacturing industry sectors at this level have low technology. Food, Beverages, Tobacco, Textile-Garments, Furniture, Paper and Paper Products etc are, for example, fall in this category. Regions in which such sectors have their weight can be referred to as Semi-Peripheral regions.

In this type of economy, financial markets are yet at their infancy with goods and services markets are recently emerging; there is semi-dependency to other regions and the process of marketization is in progress. The need for imported technology for production is pressing.

15 AKPINAR, Rasim, M.E. ÖZSAN, K.TAŞCI, "Doğu Anadolu Bölgesinde Hayvancılık Sektörünün Rekabet edebilirliğinin Analizi", Gümüşhane Üniversitesi, Sosyal Bilimler Elektronik Dergisi Sayı 5, Ocak 2012

6.1.3. Third Level

In a country at this level, manufacturing industry sectors with middle-low technology have their weight in national economy. The intensity of technology has increased relative to the earlier level and there are associated productivity increases.

There is yet no sharp rupture from labour-intensive industries. The weight of agricultural employment still persists though in decline. According to Agenor et al. (2012), this economic structure which is experiencing a delayed process of development ensures increase in labour productivity by using imported technologies and manufacturing industry provides a new field of employment for labour force breaking apart from agriculture. Sectors at this level include "coke, refined oil products and nuclear fuel, plastic and rubber products, other non-metal mineral products and basic metal industry, etc.

This region which we can refer to as semi-periphery is dependent to global and national centres; market mechanism operates in some way; also some distance has been covered in complying with the rules of global systems of economic and finance and capital depth has been attained to certain extent.

6.1.4. Fourth Level

Regions at this level have industry based economies competitive at international level. Manufacturing industry sectors working with middle-high technology have their weight in overall production. More specifically, these sectors are: Chemicals, machinery and equipment, electrical machinery and devices, motor vehicles etc. The quality and productivity of labour force are higher than the previous level and consequently there are higher wages and production costs.

The rate of urbanization is above 75% in these regions that can produce urbanization economies as well. They are "national centres" and also centres of attraction that are fully integrated to global markets and capable of competing in line with relevant rules.

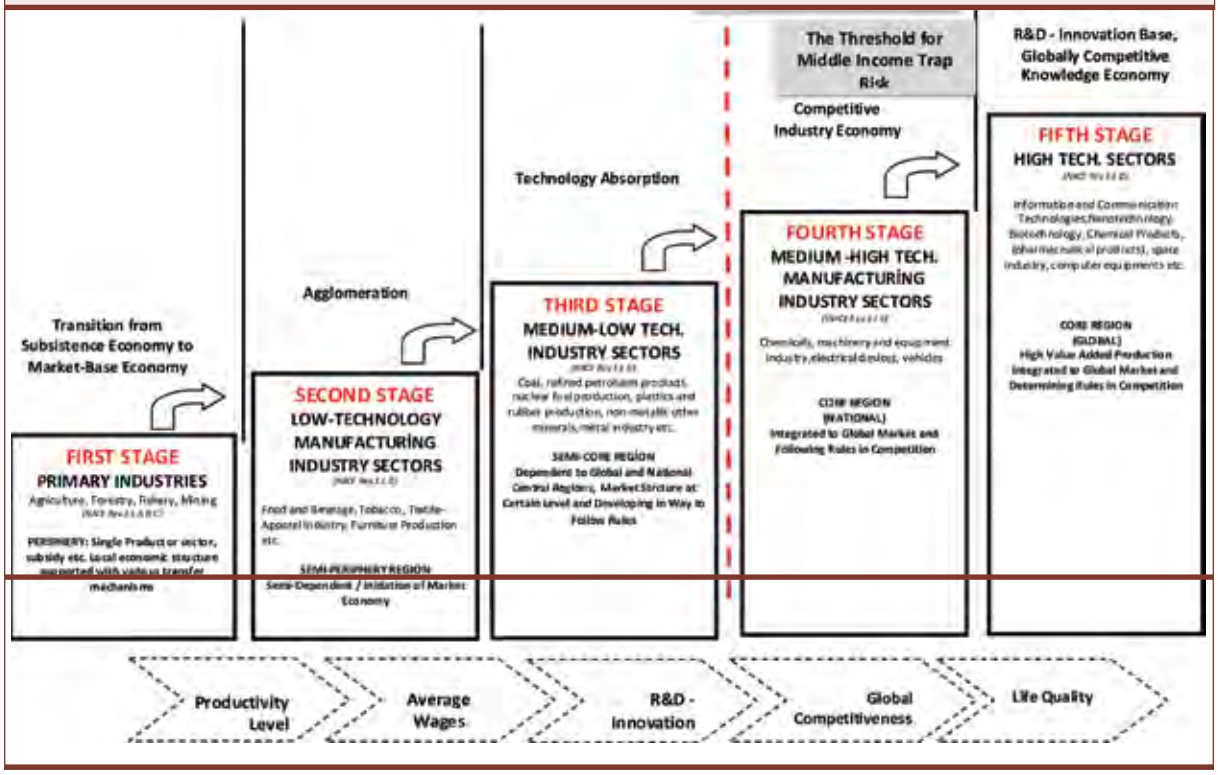
6.1.5. Fifth Level

These are regions characterized by global information economics based on R&D and innovation. Their structure of production is characterized by high value added and high-technology manufacturing industry sectors and innovative industries based on information. The share of agricultural value added and employment in economy is very small. These regions are global centres also determining the rules of the global economic system. Services sectors are quite developed. As nodes of international finance and labour force flows, there regions receive international migration (qualified labour force). The leading sectors include information and communication technologies, nanotechnologies, biotechnology, chemicals and chemical products (pharmaceuticals, medical chemicals and botanic products); office, accounting and data processing devices; radio, television and communication equipment; medical devices; precision and optic devices and watches; transportation vehicles (including planes and spacecraft).

6.2. Development Level Taxonomy of Regions in Terms of Production Structure

According to the theoretical and analytical framework explained in preceding sections, stages given in the following figure will be useful in understanding the status of a region or country at national or global scale with respect to its level of development.

Figure 20: Development Stages of Regions with respect to Production Structure



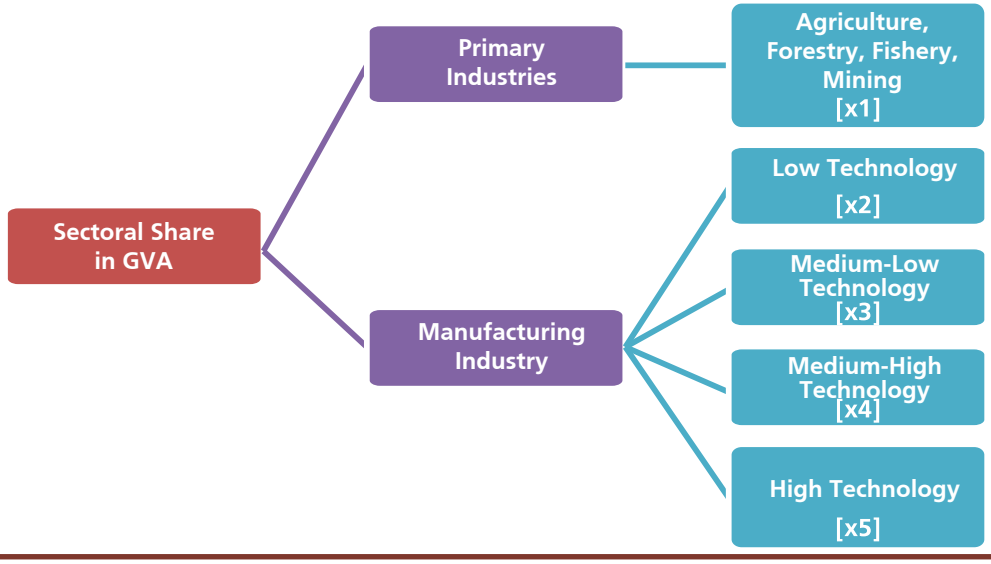
Source: Authors' Calculations

Labour Statistics for the period 2003-2008, Gross Regional Value Added Data for the period 2004-2008 and import/export data for the period 1996-2011 published by the Statistics Institute of Turkey were used for the analysis to be conducted for 26 Level-2 regions according to NUTS.

6.3. Identification of Technology Levels of Regions in Turkey with Respect to Production Structure

While leaving the services sector out, sector-based Gross Value Added data are taken for manufacturing industry which represents primary industries and the sector of industry. Hence the term "production structure" covers production by primary industries and under the sector of industry.

Figure 21: Method of Computing Level of Technology



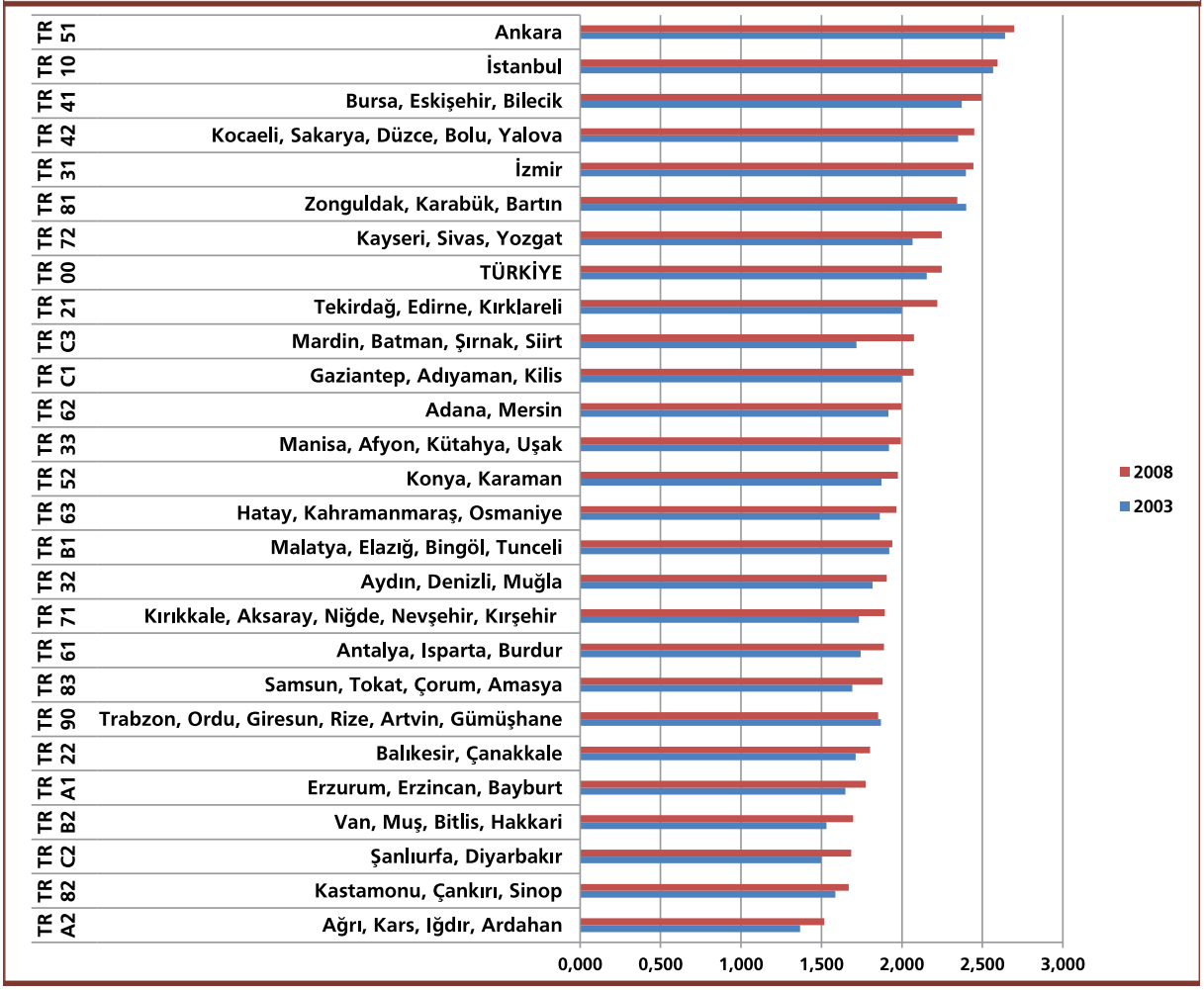
The figure above shows the level of the weight of sectors used in the analysis. The aim is to classify a given region's gross value added in agriculture and industry with respect to levels of technology.

In regional-sectoral analysis, manufacturing industry sectors are classified at four levels as advanced, middle-high, middle-low and low technology according to EUROSTAT NACE Rev.1.1[16]. Including primary industries, this study covers 5 levels in total.

For example, while the share of agriculture in total agriculture and industry GVA value of TR21 Tekirdağ-Edirne and Kırklareli region was 33.4% in 2004, it later fell to 24.5% in 2008. The share of industry, on the other hand, increased from 66.4% to 75.5% in the same period. For the year 2008 and in terms of annual turnover, we have the following values for the manufacturing industry sector of the region: low technology, 62.1%, middle-low technology 27.8%, middle-high technology 9.7% and high technology 0.3%. Given this, the level of technology in the region for the year 2008 is: 24.5% x 1 + 75.5% x 62.1% x 2 + 75.5% x 27.8% x 3+75.5% x 9.7% x 4+75.5% x 0.3% x 5 = 2.2164.

The technology level of this region in terms of 2008 turnover of enterprises is middle-low. Figure 20 below gives findings related to levels of technology for 26 level-2 regions obtained by using the same method.

Figure 22: Technology Level of Regions with Respect to the Number of Enterprises/Local Units



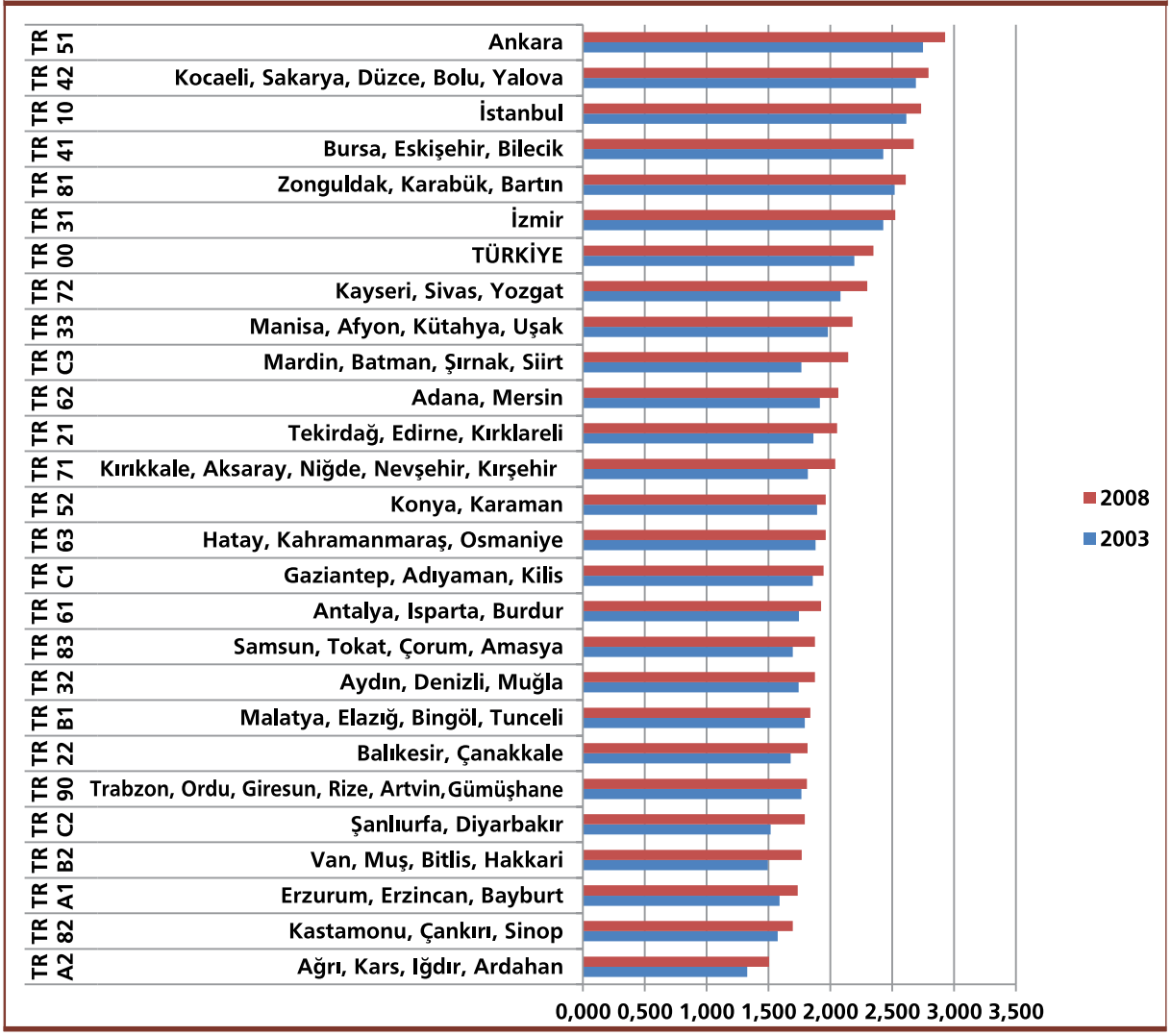
Source: Authors' Calculations

16 EUROSTAT, Aggregations of manufacturing based on NACE Rev 1.1 , http://epp.eurostat.ec.europa.eu/

According to the number of enterprises and local units, regions with advanced levels of technology are R51 Ankara, TR10 İstanbul, TR41 Bursa, Eskişehir, Bilecik, TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova, TR31 İzmir, TR81 Zonguldak, Karabük, Bartın, TR72 Kayseri, Sivas, Yozgat and TR21 Tekirdağ, Edirne, Kırklareli.

The reason for the region TR81 to appear here is that the region is small in size and the majority of few enterprises existing in the region are in heavy industry. It is interesting to note that TR72 Kayseri region is at higher ranks of the list. The 5 regions at lowest levels are TR22 Balıkesir, Çanakkale, TRA1 Erzurum, Erzincan, Bayburt, TRB2 Van, Muş, Bitlis, Hakkari, TRC2 Şanlıurfa, Diyarbakır, TR82 Kastamonu, Çankırı, Sinop and TRA2 Ağrı, Kars, Iğdır, Ardahan. The common characteristic of these regions is the high proportion of young and elderly dependent population, which is the basic reason for limited number of entrepreneurs, and relatively weak depth of capital.

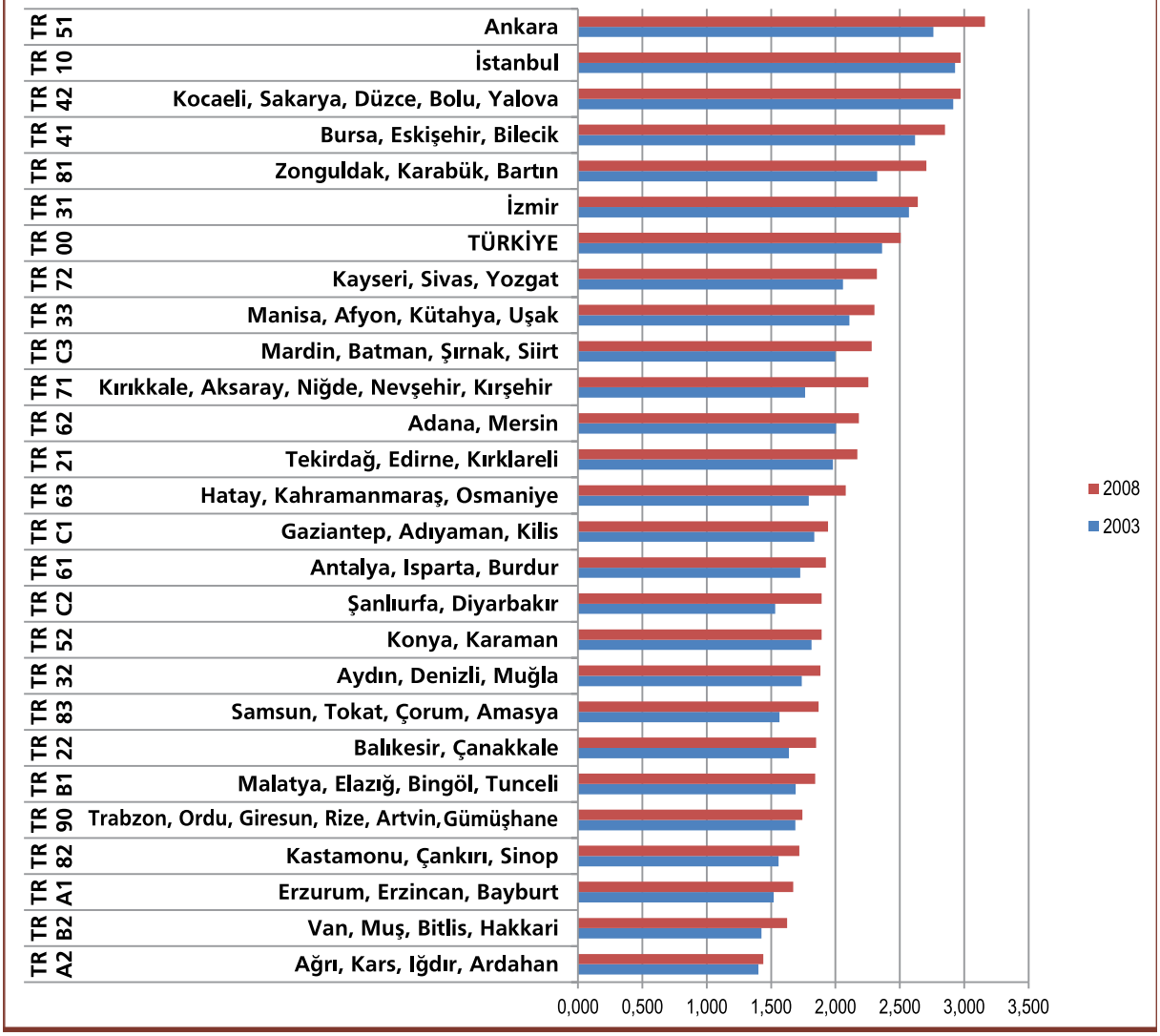
Figure 23: Technology Levels of Regions with Respect to Number of Employees



Source: Authors' Calculaitons

The TR51 Ankara region leads the list in terms of the number of working people. It is followed by industrially developed regions of TR41 Kocaeli, Sakarya, Düzce, Bolu, Yalova, TR10 İstanbul and TR41 Bursa, Eskişehir, Bilecik. It is worth noting that Turkey TR72 Kayseri, Sivas, Yozgat region ranks high although remaining below the country average.

Figure 24: Technology Levels with Respect to Labour Remuneration (Salaries and Wages)



Source: Authors' Calculations

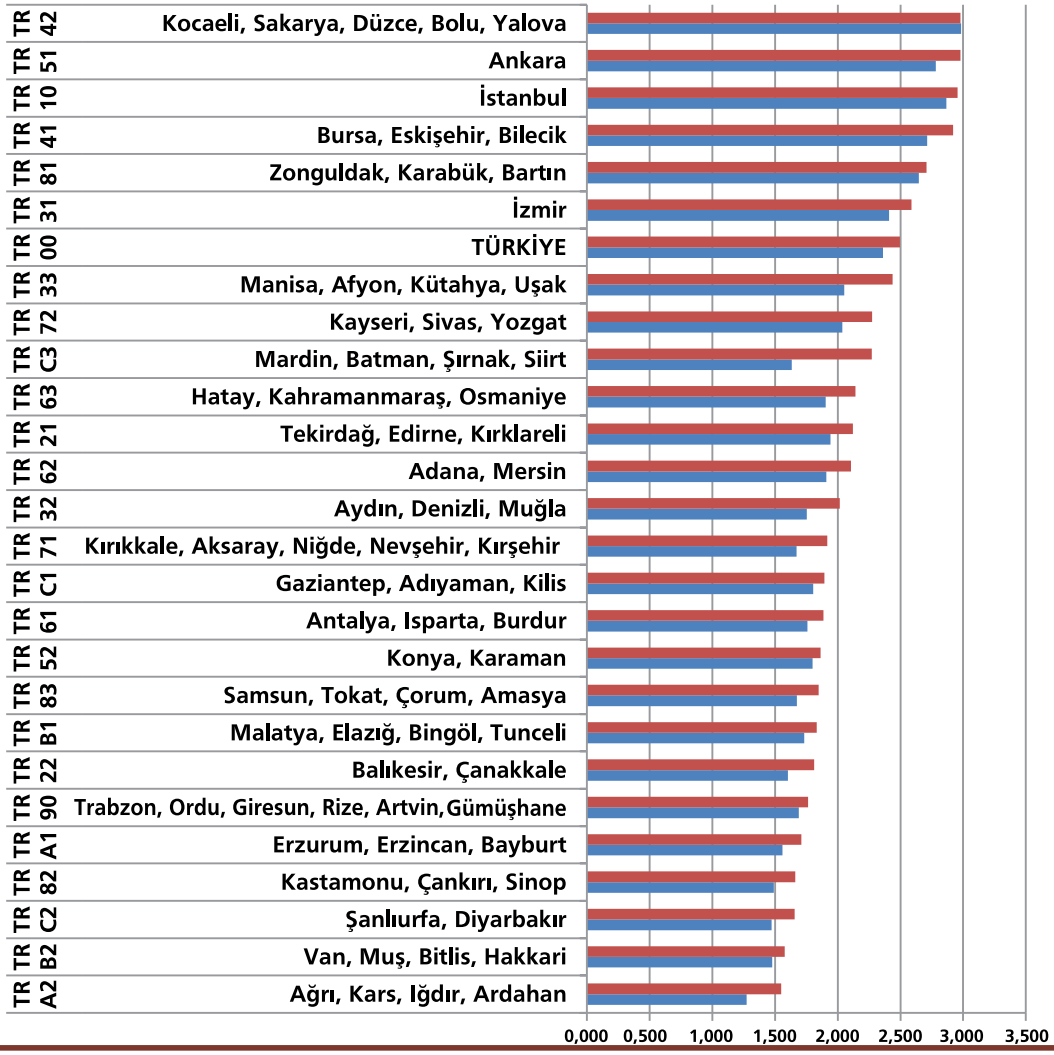
The regions with most advanced levels of technology in terms of salary and wage payments are TR51 Ankara, TR10 İstanbul, TR41 Bursa, Eskişehir, Bilecik, TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova, TR31 İzmir, TR81 Zonguldak, Karabük, Bartın and TR72 Kayseri, Sivas, Yozgat bölgeleridir. The reason for the region TR81 to appear here is that the region is small in size and the majority of few enterprises existing in the region are in heavy industry. It is interesting to note that TR72 Kayseri region is at higher ranks of the list.

Salaries and wages make up one of the basic elements in terms of site selection for enterprises and mobility of labour force. The wage elasticity of qualified labour force is higher than that of other working groups. In Ankara, for example, wages paid to highly qualified labour force are above the rate of employment. Those working with advanced technology in such industrialized provinces as İzmir, Kocaeli and Bursa are paid lower than in Ankara.

As can be seen in the chart, there was rapid increase in technology levels of all regions in the period 2003-2008 in terms of labour remuneration (salaries and wages). This confirms that the existing structure of production can create qualified employment and that transformation of production structures takes place not only in developed but more or less in all regions.

We see the lowest rate of increase in the region TRA2 Ağrı, Kars, Iğdır and Ardahan. Small scale, low level of entrepreneurship stemming from insufficient capital accumulation, limited market opportunities and weight of subsistence economy are the major problems affecting economic development in this region. For this region and similar ones, the following options need to be considered: rather than İstanbul, Ankara and İzmir as national markets, connecting these regions, for example, to neighbouring Iran-Tabriz, a market of 2 million; adopting the approach of creating a giant (enterprise) in each region and selecting and supporting SMEs that can create business-ecosystems with strong development potential and feeding effect; and development of incentive mechanisms that focus not only on supply but also on demand side.

Figure 25: Levels of Technology with Respect to Total Annual Turnover of Enterprises



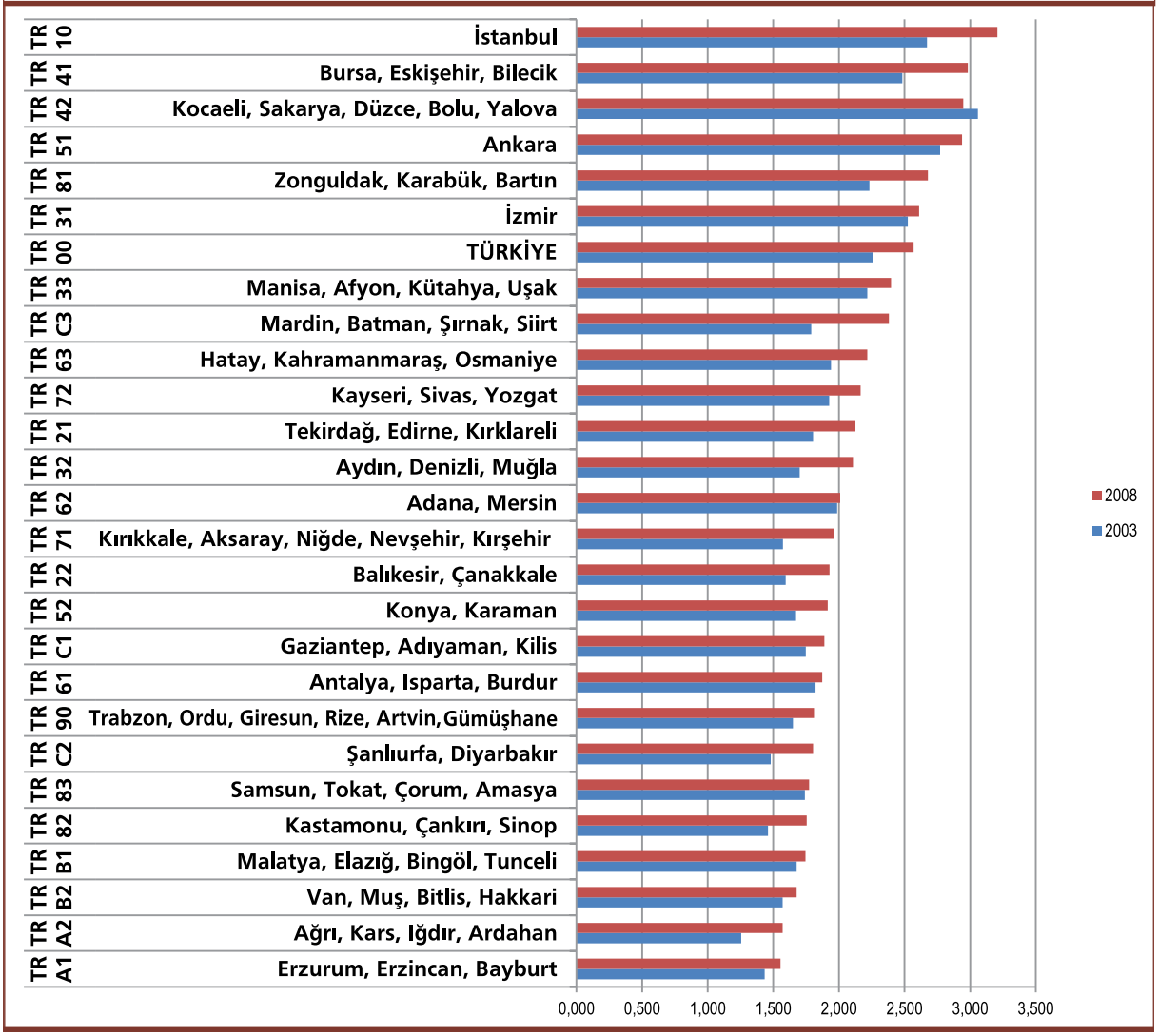
Source: Authors' Calculations

The regions at advanced levels of technology with respect to total annual turnover of firms are TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova, TR51 Ankara, TR10 İstanbul and TR41 Bursa, Eskişehir, Bilecik. The regions at the bottom of the list are the same with those having the least number of enterprises. Another common characteristic of these regions is that they are all giving migration out.

TR41 Bursa, Eskişehir, Bilecik, TR51 Ankara and TR33 Manisa, Afyon, Kütahya Uşak are the leading regions with relatively large scale economies and, at the same time, rapidly improving their levels of technology in terms of working capital turnover..

With the exception of TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova region, all regions increased their working capital turnover in the period 2003-2008. This increase in the level of turnover is good news for enterprises which constitute the micro-layer of country's production structure.

Figure 26: Technology Levels in Terms of Gross Investments in Material Goods

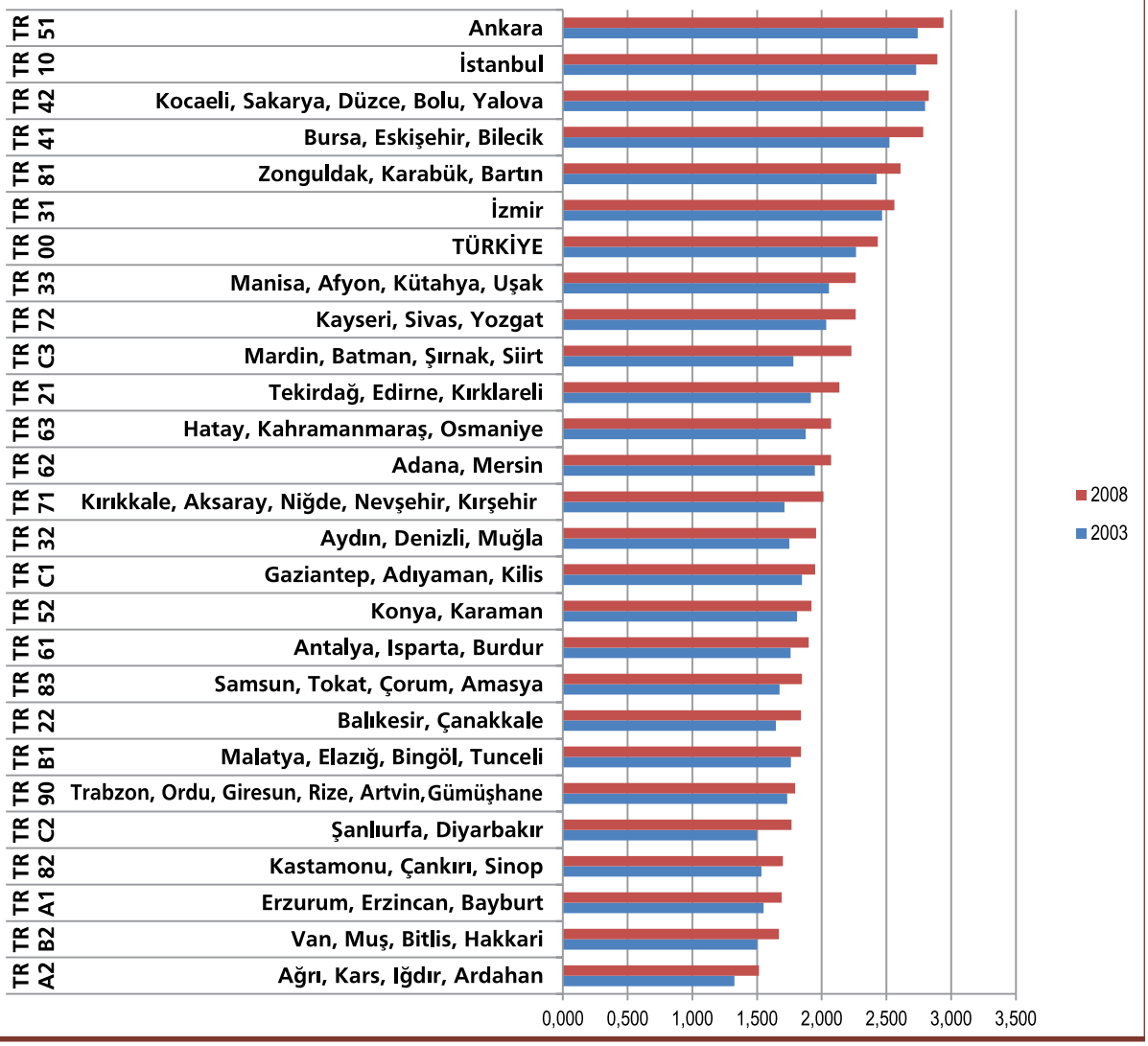


Source: Authors' Calculations

In terms of investments, high technology regions are TR10 İstanbul, TR41 Bursa, Eskişehir, Bilecik, TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova and TR51 Ankara. It is only natural that regions where the scale of enterprises are also the leading ones in gross investments in material goods. The difference between investments and operating capital/turnover stems from the fact that large-scale enterprises in these regions import goods at higher levels of technology relative to their production structures while supplying relatively low technology goods. Ankara is characterized by employing more qualified labour force at relatively smaller enterprises and paying higher wages compared to other regions.

By taking the average of index values developed for local enterprise units, number of working people, salaries and wages, turnover and gross investment in material goods, a general index is derived for all regions. Technology levels of regions according to this are given below.

Figure 27: Technology Levels of Regions

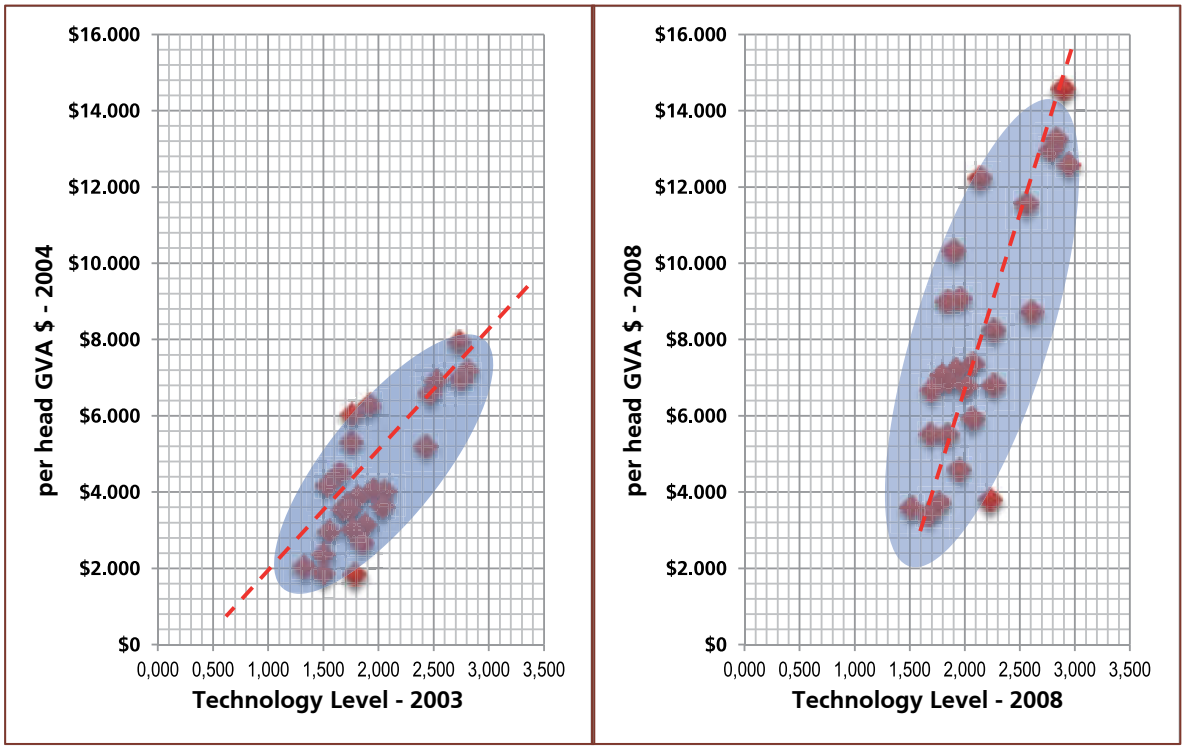


Source: Authors' Calculations

Among level-2 regions in Turkey, one with the highest level of technology is TR51 (Ankara), followed by regions TR10 (İstanbul) and TR42 (Kocaeli, Sakarya, Düzce, Bolu, Yalova). Other regions with index value higher than 2.5 are TR31 (İzmir), TR41 (Bursa, Eskişehir, Bilecik) and TR81 (Zonguldak, Karabük, Bartın). The country average increased from 2.26 to 2.43 from 2003 to 2008. The lowest ranking regions are TRA2 (Ağrı, Kars, Iğdır, Ardahan) and TRB2 (Van, Muş, Bitlis, Hakkari).

Since this index work omits the scale of regions and takes as reference only sectoral regional values given by the existing TÜİK Annual Labour Statistics for the period 2003-2008, calculations too are limited to available data. Thus, in some small-scale regions, despite low productivity in agriculture and limited contribution to national value added, relatively advanced production by few enterprises in manufacturing industry may pull the index value of the region concerned upward. Examples include Zonguldak and Batman where few but large-scale and middle-high technology enterprises with large investment have their weight in regional economy. With the exception of these two outliers, it is possible to say that the index value is consistent and more consistent observations can be made for regions larger than a specific scale.

Figure 28: Relationship between Per Capita GVA and Regional Technology Level (2004-2008)



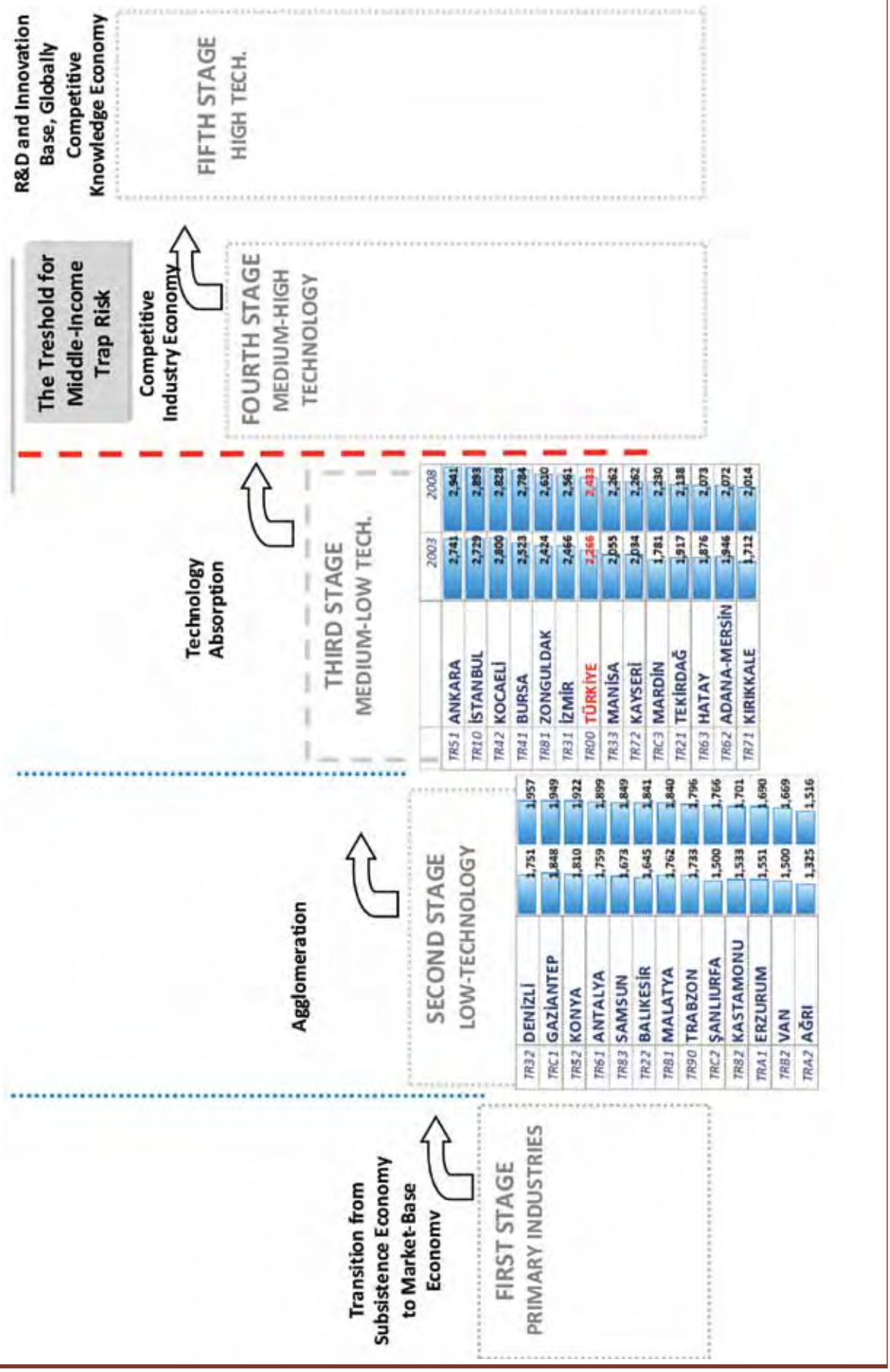
Source: Authors' Calculations

As can be seen above, while regions were closer to each other in terms of per capita GVA and levels of technology in 2004, the regions including TR10 Istanbul in the first place and TR51 Ankara, TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova, TR41 Bursa, Eskişehir, Bilecik and TR31 İzmir regions as industrialized ones with GRO above 50 billion $ jumped ahead and widened the distance after 2008. In small and underdeveloped regions, increase in per capita income as the most fundamental indicator of individual wealth remains limited.

It is observed that regions enjoying highest increase in per capita GRO are, at the same time, those with advanced technology levels. As can be seen in the figure below, while at the level of middle-low technology according to 2008 data, these regions are already forcing the boundaries of this level to transfer to middle-high technology. It is not surprising that, according to 2011 per capita GRO data, there regions are among those immune from the middle-income trap risk.

Increases in average national income, per capita incomes in region and level of technology in the period 2003-2008 explain the rapid transformation taking place in this period in terms changing composition of production.

Figure 29: Classification of Regions w.r.t Technology Level



7. REGIONAL ANALYSIS OF FOREIGN TRADE

7. REGIONAL ANALYSIS OF FOREIGN TRADE

As far as Turkey is concerned, regional diversity of production structure is also critical for middle income trap assessment. For instance, it may be considered that İstanbul and its vicinity has already covered a significant distance on its way out of this trap while the trap is a more salient threat for regions at middle-income level. Yet, for underdeveloped regions of Turkey, it is also possible to speak about the threat of poverty trap. We see that regions immune from middle income trap risk are industrialized ones integrated with global markets; that can present their goods to international markets and compete there. It can be said at this point that industrialization and development of export oriented sectors bear importance for the welfare creating capacity of these regions. Hence, it will be useful to engage in regional analysis of country's foreign trade.

7.1. Foreign Trade Structure of Regions – Number of Firms and Foreign Trade Deficit

Examining foreign trade volume and rates of growth on the basis of Level-2 regions (Table 23) we see that Istanbul accounts for more than half of total foreign trade. The share of İstanbul in total foreign trade was 61.6% in 2002, then falling to 54.3% in 2011. After İstanbul, there is a second group of regions in terms of volume of foreign trade where regions have values close to each other: TR41 (Bursa, Bilecik, Eskişehir), TR51 (Ankara), TR31 (İzmir) and TR42 (Kocaeli, Sakarya, Düzce, Bolu, Yalova). Apart from these, the regions TR32, TR62, TR63 and TRC1 also enjoyed expanding foreign trade volumes throughout the period 2002-2011.

Table 23: Foreign Trade Volume in Level 2 Regions (Million US$)

Region	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
TR10	49.899	69.002	97.651	111.852	128.277	158.622	184.814	134.296	151.604	185.359
TR21	665	817	899	994	1.054	1.309	1.682	1.264	1.617	1.955
TR22	248	327	408	498	534	752	1.011	782	922	1.154
TR31	5.066	6.781	8.804	9.632	10.908	13.465	16.136	12.387	15.102	18.693
TR32	1.268	1.672	2.131	2.708	3.378	4.269	4.884	3.621	4.938	6.268
TR33	775	988	1.294	1.452	1.692	2.154	2.538	2.125	7.202	8.815
TR41	6.369	8.190	10.862	11.581	14.337	17.720	21.177	17.188	21.955	25.222
TR42	3.515	5.050	8.464	11.086	14.187	17.160	20.754	12.416	23.001	28.936
TR51	5.890	5.491	6.180	7.368	9.076	11.060	13.231	12.214	14.676	18.515
TR52	343	494	732	934	1.181	1.577	1.854	1.508	2.052	2.692
TR61	391	624	1.026	959	1.038	1.408	1.707	1.407	2.097	2.102
TR62	1.563	2.180	2.781	3.176	3.641	4.711	5.488	4.567	5.844	7.307
TR63	1.098	1.354	1.855	2.430	3.382	4.861	6.072	5.151	6.570	9.514
TR71	91	102	150	186	236	365	485	381	627	839
TR72	785	989	1.505	1.701	1.961	2.393	2.620	2.113	2.779	3.382
TR81	511	767	1.111	1.698	2.069	2.007	2.996	2.125	2.313	2.651
TR82	53	48	73	143	144	202	381	172	115	162
TR83	180	280	483	512	642	928	1.522	1.021	1.204	1.873
TR90	639	805	1.266	1.851	1.651	1.972	2.109	1.659	2.165	2.344
TRA1	16	40	37	39	42	72	78	94	79	108
TRA2	36	51	82	118	128	214	219	175	250	260
TRB1	130	179	185	263	354	320	388	337	486	493
TRB2	22	30	44	68	99	220	238	452	390	452
TRC1	1.311	1.917	2.685	3.402	3.797	4.846	6.184	5.215	7.179	9.706
TRC2	85	119	160	221	280	401	498	464	625	670
TRC3	67	121	256	524	505	812	951	1.271	1.394	1.991

Source: Computed by the authors on the basis of TÜİK data.

Looking at the rates of growth in volume of foreign trade over years, we see that values of TR33 region run close to the country average first, but show an increase by 238.86 in 2010 as a post-crisis year. Similarly, rates of growth in foreign trade were high in 2007 and 2009 as pre and post-crisis years in TRB2.

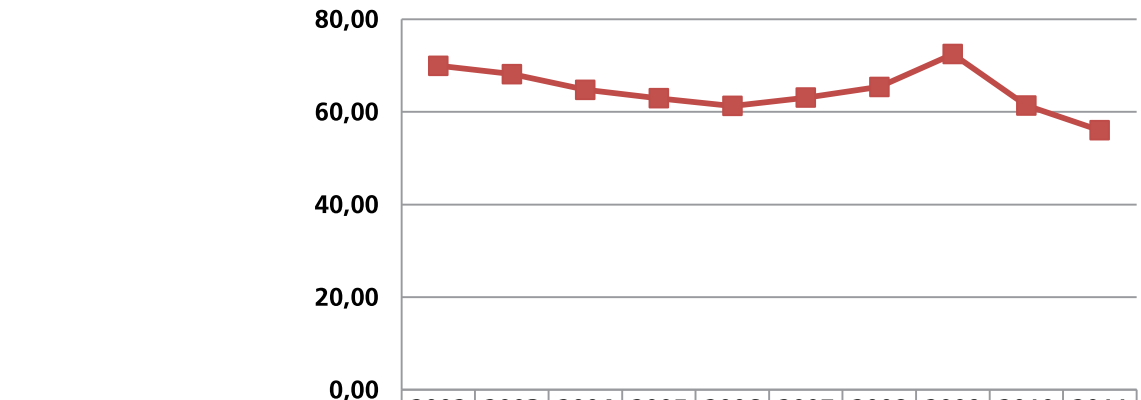
Apart from TRB2, the regions where there was growth in the volume of foreign trade in 2009 are TRC3 and TRA1. In the regions TRA1 and TRB2 the volume of foreign trade is reduced in 2010 while TRC3 registered a low rate of growth. This can be interpreted to suggest that regions mentioned were affected by the crises with some time-lag. Also, we see that the decline in TR82 which is associated with the crisis continued as well in 2010. However, all regions increased their volume of foreign trade in 2011.

In the period 2003-2011 as a whole, foreign trade volume displayed high rates of growth in TRC3, TRB2 and TR33 regions. Relatively higher rates of growth were also observed for the regions TR83, TR63, TR71 and TR42.

According to per capita export figures of regions, we see the highest value in TR10 (İstanbul). Following İstanbul, TR42, TR42, TR3, TR32 and TRC1 regions all have values over 1,000 $. In TRC3 and TR81 regions where the rates of growth in exports are high per capita export value is approaching 1,000$ while the figures for TRB2 and TRC3 regions are quite low.

In Turkey, the export/import coverage ratio has a falling tendency for the period 2002-2011, displaying marginal increases in the sub-period 2006-2008. In 2009, under the impact of the crisis, it reached its highest level since imports shrank more than exports. The export/import coverage ratio in 20011 is about 14 points lower than in 2002.

Figure 30: Export Import Coverage Ratio ,Turkey (%)



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Export / Import Rate	69,94	68,15	64,76	62,92	61,28	63,08	65,37	72,48	61,38	56,01

Source: TÜİK

The export/import coverage ratio which was 70% in 2002, dropped to 56% by the end of 2011. In the period 2002-2011, this ratio did not exceed 65% with the exception of 2009 as the crisis year. In the period 2002-2011, the highest export/import coverage ratios in Level-2 regions are observed in TRB2 and TRC3 where there were high rates of growth in exports. The region TR90 also comes closer to the earlier two regions and ratios of these three regions are considerable higher than ratios in other regions. The regions TR81, TR63, TR51, TR10 and TR83 are those where the export/import coverage ratio is the lowest.

Table 24: Export Import Coverage Ratio in Level 2 Regions (%)										
Region	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
TR10	72.49	66.66	60.57	59.48	57.85	60.26	66.03	70.52	53.98	49.57
TR21	108.87	95.40	91.92	78.04	95.19	101.07	79.64	104.18	80.19	72.54
TR22	135.17	128.41	124.28	140.02	162.94	122.34	98.94	136.05	126.27	91.97
TR31	121.39	105.05	87.57	93.16	99.81	91.43	94.11	97.62	79.37	76.00
TR32	224.01	199.05	254.19	204.64	166.40	166.65	156.46	155.78	141.27	133.43
TR33	143.55	158.20	153.84	147.86	146.61	142.52	141.58	163.65	117.98	117.14
TR41	131.73	125.16	108.93	108.81	117.58	119.23	125.20	127.93	107.16	98.48
TR42	105.47	98.97	107.02	123.72	129.10	123.86	125.78	107.89	97.10	101.38
TR51	34.63	56.39	56.36	56.01	65.65	62.19	68.13	67.25	62.10	55.36
TR52	93.75	86.06	83.61	107.12	97.54	108.59	124.83	140.67	129.27	108.40
TR61	157.40	199.46	123.16	120.40	123.42	145.84	142.18	173.00	130.77	152.53
TR62	99.84	95.06	90.82	90.02	90.94	77.62	76.57	91.69	76.58	73.50
TR63	72.30	80.04	86.71	67.12	56.55	45.84	54.76	56.44	54.05	43.72
TR71	140.75	143.01	109.62	88.43	114.47	103.90	101.75	154.80	124.00	105.50
TR72	87.34	95.80	79.07	75.30	66.39	76.19	81.35	91.72	79.02	84.45
TR81	9.05	10.65	10.55	8.19	9.71	14.01	21.29	31.67	23.73	34.51
TR82	91.01	96.98	112.19	91.89	112.47	218.76	322.76	239.44	107.78	136.33
TR83	65.02	48.61	50.70	64.09	59.53	57.18	68.65	77.71	63.09	57.87
TR90	384.86	325.94	453.72	701.06	594.92	658.61	536.12	649.44	768.00	729.11
TRA1	87.06	37.34	73.05	139.02	105.08	69.03	105.57	57.62	115.67	35.73
TRA2	238.69	267.73	279.05	160.55	184.67	255.39	173.92	259.61	267.70	218.75
TRB1	282.30	226.28	321.11	183.79	164.50	298.45	350.85	298.68	195.70	198.74
TRB2	43.78	66.33	143.84	639.69	744.05	982.11	1.434.84	1.632.86	801.08	445.23
TRC1	92.60	85.03	96.62	97.50	99.09	105.69	115.92	138.40	101.34	99.94
TRC2	19.31	22.92	44.64	68.58	67.35	73.64	92.68	111.37	117.77	90.40
TRC3	215.11	218.33	338.31	922.20	498.10	340.20	689.85	1.210,53	740.58	822.63

Source: TÜİK

Looking at data related to foreign trade deficit, we see that in the period 2002-2011 trade deficit grew by about 7 times from 15.5 billion $ to 105.9 billion $. With respect to individual regions, 11 Level-2 regions have deficits while 15 others have surplus. TR10 is the region where trade deficit is largest and the value for this region is considerably higher than in other regions. This distinct place of TR10 İstanbul region in terms of large trade deficit derive from the concentration of relevant activities in this region and from the fact that firms operating in other regions have their registrations in İstanbul. Other than Istanbul, large trade deficits can also be observed in regions TR51, TR63 and TR81. Among these three regions, TR81 is the one where exports grow rapidly and TR63 is, to the contrary, the region where imports increase at high rates. The regions with largest trade surpluses are TR90, TR41, TR32 and TR42. Further, TR33 and TR71 among regions where highest rates of growth in imports are observed for the period 2003-2011, and TRB2 and TRC3 among regions where highest rates of growth in exports are observed in the same period, all have trade surpluses. Similarly, trade deficits are observed in TR63 and TR83 where rates of growth in imports are highest as well as in TRC2 and TR81 where rates of growth in exports are highest.

Table 25: Foreign Trade Structure of Regions – Number of Firms and Foreign Trade Deficit									
Region 1996		DIFFERENCE between the numbers of exeporting and importing firms				DIFFERENCE between the amounts of exports and imports (x 1000 ABD $)			
		2002	2007	2011	1996	2002	2007	2011	
TR10	İstanbul	-11.081	-6.069	-8.648	-9.083	-11.015.611	-7.958.927	-39.331.908	-62.491.570
TR21	Tekirdağ, Edirne, Kırklareli	-160	-13	-38	-199	-139.249	28.242	6.981	-311.139
TR22	Balıkesir, Çanakkale	-111	22	-21	-53	51.199	37.147	75.506	-48.304
TR31	İzmir	-834	186	-47	-645	302.739	489.438	-602.554	-2.549.510
TR32	Aydın, Denizli, Muğla	-270	100	236	161	-235.580	485.318	1.067.016	897.617
TR33	Manisa, Afyon, Kütahya, Uşak	-226	-14	70	24	-126.703	138.659	377.582	695.969
TR41	Bursa, Eskişehir, Bilecik	-481	214	376	332	-501.537	872.110	1.554.381	-192.749
TR42	Kocaeli, Sakarya, Düzce, Bolu, Yalova	-398	-167	-291	-355	-4.619.571	93.573	1.829.028	197.817
TR51	Ankara	-2.388	-1.835	-2.543	-2.678	-2.173.825	-2.859.912	-2.578.233	-5.320.284
TR52	Konya, Karaman	-60	104	20	109	-86.097	-11.071	64.912	108.571
TR61	Antalya, Isparta, Burdur	-170	-59	-176	-246	27.501	87.205	262.442	437.301
TR62	Adana, Mersin	-128	56	28	72	-1.075.322	-1.284	-593.454	-1.115.934
TR63	Hatay, Kahramanmaraş, Osmaniye	53	239	303	352	-110.117	-176.492	-1.805.468	-3.725.779
TR71	Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir	-5	-10	-24	-57	-5.869	15.457	6.974	22.453
TR72	Kayseri, Sivas, Yozgat	-127	97	199	133	-162.687	-53.058	-323.352	-285.082
TR81	Zonguldak, Karabük, Bartın	-50	-31	-33	-37	-492.040	-425.991	-1.513.836	-1.290.719
TR82	Kastamonu, Çankırı, Sinop	-4	10	-17	-14	-24.219	-2.480	75.165	24.941
TR83	Samsun, Tokat, Çorum, Amasya	-46	-32	-92	-55	-28.500	-38.233	-252.889	-499.723
TR90	Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane	130	136	108	170	269.057	375.210	1.452.130	1.778.246
TRA1	Erzurum, Erzincan, Bayburt	11	6	-16	-42	-1.929	-1.131	-13.227	-50.941
TRA2	Ağrı, Kars, Iğdır, Ardahan	29	-9	4	-9	27.537	14.923	93.728	96.883
TRB1	Malatya, Elazığ, Bingöl, Tunceli	-52	-15	39	1	47.461	61.977	159.284	163.062
TRB2	Van, Muş, Bitlis, Hakkari	34	-15	46	-372	-9.533	-8.450	179.377	286.468
TRC1	Gaziantep, Adıyaman, Kilis	-125	-100	-22	41	-269.001	-50.363	134.116	-2.974
TRC2	Şanlıurfa, Diyarbakır	-114	-127	-161	-63	-65.829	-43.353	117.936	728.385
TRC3	Mardin, Batman, Şırnak, Siirt	42	3	64	194	15.499	10.163	264.154	797.277

Source: Calculated by the authors on the basis of data supplied by the Ministry of Economic Affairs .

As can be inferred from data given above, although standing for 40% of country's total tax revenue, TR10 İstanbul region is the main source of foreign trade deficit in Turkey. In 2001, the total trade deficit of Turkey was 104 billion with İstanbul accounting for 62.3 billion $ in this total. For the last 10 years, the cost of the foreign trade structure of İstanbul to the country is 316.5 billion $. İstanbul is followed by TR51 Ankara (26.3 billion $), TR63 Hatay, Osmaniye, Kahramanmaraş (12.6 billion $), TR81 Zonguldak, Karabük, Bartın (12.3 billion $) and TR31 İzmir (5.8 billion $)

7.2. Regional Distribution of Exporting and Importing Firms

There is a serious difference between the number of exporting and importing firms in Turkey. In 2011, there are 54,553 exporting firms while the number of importing firms is 66,872. In 1996 there were 12,754 exporting and 28,835 importing firms in TR10 İstanbul region, which became 28,375 and 37,458, respectively, in 2011. Alone, Istanbul rooms in 52% of all exporting and 56% of all importing firms. Tables below show the number of exporting and importing firms by regions and rates of increase in numbers in the period 1996-2011.

Table 26: Regional Distribution of Exporting Firms

Region	1996	2002	2007	2011	1996-2011 Annual Rate of Increase	2002-2011 Annual Rate of Increase
TR10	12.754	17.588	26.067	28.375	5,12%	5,46%
TR21	190	305	426	442	5,42%	4,21%
TR22	133	191	264	298	5,17%	5,07%
TR31	2.232	2.979	4.204	4.190	4,01%	3,86%
TR32	589	806	1.272	1.284	4,99%	5,31%
TR33	279	431	723	873	7,39%	8,16%
TR41	1.098	1.902	3.226	3.719	7,92%	7,74%
TR42	545	836	1.346	1.663	7,22%	7,94%
TR51	1.521	1.783	2.952	3.768	5,83%	8,67%
TR52	303	563	906	1.328	9,68%	10,00%
TR61	426	511	831	1.035	5,71%	8,16%
TR62	904	942	1.548	1.849	4,57%	7,78%
TR63	475	618	840	990	4,70%	5,38%
TR71	94	118	163	220	5,46%	7,17%
TR72	179	449	752	828	10,05%	7,04%
TR81	45	64	98	102	5,25%	5,32%
TR82	35	36	38	65	3,94%	6,79%
TR83	217	206	324	385	3,65%	7,20%
TR90	530	364	412	472	-0,72%	2,93%
TRA1	54	32	34	48	-0,73%	4,61%
TRA2	133	86	108	176	1,77%	8,28%
TRB1	78	83	182	216	6,57%	11,21%
TRB2	91	44	112	153	3,30%	14,85%
TRC1	369	597	975	1.267	8,02%	8,72%
TRC2	147	69	216	376	6,05%	20,73%
TRC3	160	116	246	431	6,39%	15,70%
TR00	23.581	31.719	48.265	54.553	5,38%	6,21%

Source: Source: Authors' Calculations

Out of 26 Level-2 regions in Turkey, there are 10 each having more than 1,000 exporting firms. The regions TR33, TR63 and TR72 are at the verge of this threshold. If we compare the periods 1996-2011 and 2002-2011 with respect to the rate of increase in the number of exporting firms, TRC2, TRC1, TRB2, TRB1 and TR52 regions lead the list with annual rate of increase of over 10% for the last 10 years. The region TRC2 Gaziantep, Adıyaman, Kilis displays particularly high performance in this respect. Within the last 10 years, there is increase in all 24 regions, compared to the period 1996-2002, with the exception of TR21 Edirne, Tekirdağ, Kırklareli and TR31 İzmir regions.

10 out of 26 Level-2 regions in Turkey have more than 1,000 importing firms in each. The region with highest increase in the number of importing firms is TRB2 Van, Muş, Bitlis, Hakkari with average annual rate of increase as 27.5% for the period 2002-2011 as a result of investments in transportation and border trade. This region is followed by TRA1 Erzurum, Erzincan, Bayburt (14.8%) and TR82 Kastamonu, Çankırı,

Sinop (13.1%). One of the most striking features of the table above is that the region TR51 Ankara has importing firms 1.7 times the number of exporting firms.

Table 27: Regional Distribution of Importing Firms

Region	1996	2002	2007	2011	1996-2011 Annual Rate of Increase	2002-2011 Annual Rate of Increase
TR10	23,835	23,657	34,715	37,458	2.87%	5.24%
TR21	350	318	464	641	3.85%	8.10%
TR22	244	169	285	351	2.30%	8.46%
TR31	3,066	2,793	4,251	4,835	2.89%	6.29%
TR32	859	706	1,036	1,123	1.69%	5.29%
TR33	505	445	653	849	3.30%	7.44%
TR41	1,579	1,688	2,850	3,387	4.89%	8.05%
TR42	943	1,003	1,637	2,018	4.87%	8.08%
TR51	3,909	3,618	5,495	6,446	3.18%	6.63%
TR52	363	459	886	1,219	7.87%	11.46%
TR61	596	570	1,007	1,281	4.90%	9.41%
TR62	1,032	886	1,520	1,777	3.45%	8.04%
TR63	422	379	537	638	2.62%	5.96%
TR71	99	128	187	277	6.64%	8.96%
TR72	306	352	553	695	5.26%	7.85%
TR81	95	95	131	139	2.41%	4.32%
TR82	39	26	55	79	4.51%	13.14%
TR83	263	238	416	440	3.27%	7.07%
TR90	400	228	304	302	-1.74%	3.17%
TRA1	43	26	50	90	4.72%	14.79%
TRA2	104	95	104	185	3.67%	7.69%
TRB1	130	98	143	215	3.19%	9.12%
TRB2	57	59	66	525	14.89%	27.49%
TRC1	494	697	997	1,226	5.85%	6.48%
TRC2	261	196	377	439	3.30%	9.37%
TRC3	118	113	182	237	4.45%	8.58%
TR00	40,112	39,042	58,901	66,872	3.25%	6.16%

Source: Authors' Calculations

7.3. Foreign Trade Performance of Regions

In 1996, there were 22 provinces each having more than 100 exporting firms. This number increased to 25 in 2002 and then to 33 as of the end of 2011. In 1996 only Ankara, Bursa, İstanbul and İzmir had exporting firms more than 500. In 2002, Denizli, Gaziantep, Mersin, Kocaeli and Konya joined them to make the total number 9 and then 13 at the end of 2011 with the joining of 4 more provinces. These four provinces are Adana, Antalya, Hatay and Kayseri. As of the end of 2011, 48,306 exporting firms out of a total of 54,566 (88% of total) are active in these 13 provinces while there are only 6,260 exporting firms operating in the remaining 68 provinces.

In 1996, there were 3 provinces, Ankara, İstanbul and İzmir having more than 1,000 exporting enterprises. The number of such provinces first increased to 4 with Bursa in 2002, and then to 7 at the end of 2011 with Gaziantep, Kocaeli and Konya. As of the end of 2011, 43,322 exporting enterprises (80% of total) are in these 7 provinces and there are only 11,244 exporting enterprises in the remaining 74 provinces.

Figure 31: Exporting Performance of Selected Provinces (1996-2011)

Source: Calculated by the authors on the basis of foreign trade data supplied by the Ministry of Economic Affairs. Average annual export and import values of these firms are given in Table below.

Table 28: Export Value of Regions per Firm (x 1000 $)						
D2 CODE	1996	2002	2007	2011	1996-2011 CAGR	2002-2011 CAGR
TR10	1,080	1,192	2,288	2,165	4.44%	6.85%
TR21	1,092	1,137	1,545	1,859	3.38%	5.62%
TR22	1,546	748	1,567	1,856	1.15%	10.63%
TR31	1,434	932	1,530	1,926	1.86%	8.40%
TR32	416	1,088	2,097	2,790	12.64%	11.03%
TR33	860	1,060	1,751	5,447	12.23%	19.94%
TR41	1,301	1,904	2,987	3,365	6.12%	6.53%
TR42	1,089	2,158	7,054	8,759	13.92%	16.84%
TR51	512	850	1,437	1,751	7.98%	8.36%
TR52	351	295	906	1,054	7.12%	15.21%
TR61	389	468	1,005	1,227	7.45%	11.30%
TR62	749	829	1,330	1,674	5.15%	8.12%
TR63	652	745	1,819	2,923	9.83%	16.40%
TR71	440	452	1,141	1,957	9.78%	17.67%
TR72	1,209	816	1,376	1,870	2.76%	9.66%
TR81	522	662	2,516	6,669	17.26%	29.25%
TR82	381	697	3,644	1,440	8.66%	8.39%
TR83	358	345	1,042	1,783	10.55%	20.02%
TR90	785	1,393	4,156	4,366	11.32%	13.54%
TRA1	115	238	867	590	10.77%	10.62%
TRA2	389	299	1,426	1,014	6.17%	14.55%
TRB1	1,332	1,156	1,316	1,519	0.83%	3.08%
TRB2	182	150	1,783	2,415	17.54%	36.21%
TRC1	643	1,055	2,554	3,829	11.79%	15.39%
TRC2	307	406	1,615	2,873	15.01%	24.30%
TRC3	234	270	1,823	2,351	15.52%	27.18%
TR00	985	1,136	2,222	2,473	5.92%	9.02%

CAGR: Compounded annual growth rate.
Source: Calculated by the authors on the basis of Foreign Trade data supplied by the Ministry of Economic Affairs.

While export value per firm was 985,000 $ in 1996, it reached 2,500,000 $ as of the end of 2011. In the period 2002-2011, average annual rate of increase in export value per firm was 9.02%. The average annual rate of increase in import value per firm, on the other hand, is 11.6%. The value of imports totals to 3,100,000 $.

Table 29: Import Value of Regions per Firm (x 1000 $)						
D2 CODE	1996	2002	2007	2011	1996-2011 CAGR	2003-2011 CAGR
TR10	1,040	1,223	2,851	3,308	7.50%	11.69%
TR21	991	1,001	1,403	1,768	3.69%	6.52%
TR22	633	625	1,186	1,713	6.42%	11.86%
TR31	945	819	1,655	2,197	5.41%	11.58%
TR32	559	554	1,545	2,391	9.50%	17.63%
TR33	726	715	1,360	4,782	12.50%	23.50%
TR41	1,223	1,628	2,836	3,752	7.26%	9.72%
TR42	5,528	1,706	4,683	7,120	1.59%	17.21%
TR51	755	1,209	1,241	1,849	5.75%	4.83%
TR52	530	386	853	1,060	4.43%	11.88%
TR61	232	267	569	650	6.66%	10.41%
TR62	1,698	883	1,745	2,370	2.10%	11.60%
TR63	995	1,681	6,207	10,376	15.78%	22.41%
TR71	477	296	957	1,474	7.30%	19.51%
TR72	1,239	1,191	2,456	2,638	4.84%	9.24%
TR81	5,427	4,930	13,438	14,179	6.19%	12.45%
TR82	963	1,061	1,151	869	-0.64%	-2.19%
TR83	404	459	1,420	2,696	12.60%	21.73%
TR90	368	578	855	936	6.01%	5.51%
TRA1	189	336	854	881	10.10%	11.29%
TRA2	233	113	580	441	4.07%	16.30%
TRB1	434	347	561	768	3.63%	9.23%
TRB2	458	255	308	158	-6.43%	-5.17%
TRC1	1,025	976	2,363	3,960	8.81%	16.83%
TRC2	425	364	613	801	4.04%	9.16%
TRC3	186	187	1,013	911	10.45%	19.21%
TR00	1,088	1,152	2,488	3,089	6.74%	11.58%

CAGR: Compound annual growth rate.
Source: Calculated by the authors on the basis of Foreign Trade data supplied by the Ministry of Economic Affairs.

For the same period, 3 regions where the number of importing firms exceeds that of exporting firms rank as TR10 İstanbul (9.083), TR51 Ankara (2.678) and TR31 İzmir (635). The regions with higher number of exporting firms than importing firms are TR63 Hatay, Kahramanmaraş, Osmaniye (352), TR41 Bursa, Eskişehir, Bilecik (332) and TR90 Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane (170).

7.4. Technology Levels in Regional Foreign Trade

By using sectoral foreign trade data published on the basis of Level-2 regions for 2002 and 2011, export and import technology levels of 26 Level-2 regions were assessed through calculating an index value. Technology index values were obtained for regional exports and imports by multiplying the share of primary industries agriculture-forestry and mining in total regional exports by 1, low-technology by 2, middle-low by 3, middle-high by 4 and the share of high technology manufacturing industry by 5 and adding them up.

The export region which comes closest to middle-high technology level with the index value of 3.702 is the TR33 Manisa, Afyon, Kütahya, Uşak region. The role of high-technology enterprises established in the region is the leading factor giving this outcome. This region is followed by TR41 Bursa, Eskişehir, Bilecik region where automotive industry has its weight (index value: 3.486), TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova region with its strong industrial infrastructure in automotive, chemicals, textiles, etc (index value: 3.465) and TR51 Ankara with large-scale advanced technology enterprises and technology development zones (index value: 3.282). Since this study exclusively takes data on exports from regions as its basis,

regions such as TRA1, TRA2, TRB2 and TR71 may come to the fore for their existing export sectors despite very low levels of trade volume. Total exports from 16 provinces in these 4 regions amount to less than 2 billion$ for the year 2011.

Table 30: Technology Level of Exports from Regions (2002, 2011)

D2 CODE		2002	2011
TR33	Manisa, Afyon, Kütahya, Uşak	2.737	3.702
TR41	Bursa, Eskişehir, Bilecik	3.305	3.486
TR42	Kocaeli, Sakarya, Düzce, Bolu, Yalova	3.247	3.465
TR51	Ankara	3.139	3.282
TR81	Zonguldak, Karabük, Bartın	2.752	3.014
TRA1	Erzurum, Erzincan, Bayburt	3.188	3.005
TRB2	Van, Muş, Bitlis, Hakkari	2.987	2.977
TR52	Konya, Karaman	2.979	2.911
TR71	Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir	2.539	2.887
TR10	İstanbul	2.839	2.884
TR83	Samsun, Tokat, Çorum, Amasya	2.643	2.770
TR72	Kayseri, Sivas, Yozgat	2.851	2.768
TR31	İzmir	2.363	2.754
TRA2	Ağrı, Kars, Iğdır, Ardahan	2.592	2.719
TR21	Tekirdağ, Edirne, Kırklareli	2.915	2.668
TRC3	Mardin, Batman, Şırnak, Siirt	2.755	2.639
TR32	Aydın, Denizli, Muğla	2.110	2.537
TRC2	Şanlıurfa, Diyarbakır	2.020	2.446
TR22	Balıkesir, Çanakkale	1.999	2.445
TR62	Adana, Mersin	2.178	2.311
TR63	Hatay, Kahramanmaraş, Osmaniye	1.860	2.306
TRC1	Gaziantep, Adıyaman, Kilis	2.200	2.274
TR61	Antalya, Isparta, Burdur	1.887	2.055
TRB1	Malatya, Elazığ, Bingöl, Tunceli	2.183	2.014
TR82	Kastamonu, Çankırı, Sinop	1.813	1.802
TR90	Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane	1.446	1.561

Source: Authors' Calculations

Examining the level of technology in imports by regions, we see TR33 Manisa, Afyon, Kütahya, Uşak Region coming to the fore once more. Technology enterprises in Manisa and textile factories in Uşak need products of advanced technology. This region is followed by TR41 Bursa, Eskişehir, Bilecik and TR51 Ankara with the same index value. Then come TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova and TR10 İstanbul regions.

Table 31: Technology Level of Imports by Regions (2002, 2011)			
D2 CODE		2002	2011
TR33	Manisa, Afyon, Kütahya, Uşak	3.350	3.658
TR41	Bursa, Eskişehir, Bilecik	3.588	3.519
TR51	Ankara	3.733	3.519
TR42	Kocaeli, Sakarya, Düzce, Bolu, Yalova	3.079	3.249
TR10	İstanbul	3.323	3.226
TRB2	Van, Muş, Bitlis, Hakkari	3.382	3.088
TRC1	Gaziantep, Adıyaman, Kilis	3.358	3.024
TR61	Antalya, Isparta, Burdur	3.147	3.005
TR82	Kastamonu, Çankırı, Sinop	2.269	2.975
TR72	Kayseri, Sivas, Yozgat	3.238	2.972
TR31	İzmir	2.965	2.937
TR62	Adana, Mersin	2.919	2.936
TRC3	Mardin, Batman, Şırnak, Siirt	2.979	2.903
TR52	Konya, Karaman	3.172	2.872
TR32	Aydın, Denizli, Muğla	2.958	2.865
TR71	Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir	2.926	2.837
TRC2	Şanlıurfa, Diyarbakır	3.007	2.750
TRB1	Malatya, Elazığ, Bingöl, Tunceli	2.871	2.649
TR22	Balıkesir, Çanakkale	3.134	2.644
TR21	Tekirdağ, Edirne, Kırklareli	2.928	2.629
TRA1	Erzurum, Erzincan, Bayburt	3.728	2.539
TRA2	Ağrı, Kars, Iğdır, Ardahan	2.077	2.184
TR90	Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane	1.931	2.039
TR81	Zonguldak, Karabük, Bartın	1.906	1.529
TR63	Hatay, Kahramanmaraş, Osmaniye	1.914	1.402
TR83	Samsun, Tokat, Çorum, Amasya	1.713	1.255

Source: Authors' Calculations

7.5. Technology Balance of Regional Foreign Trade: Technology Gap

Technology gap is defined as difference in levels of technology in exports and imports. In measuring this gap at regional level, exports by services sectors are excluded. The following table is obtained by subtracting index values of technology levels in exports and imports from each other.

Table 32: Technology Gap: Difference in Levels of Technology in Exports and Imports of Regions (2002, 2011)				
D2 Code	Region	2002	2011	2011-2002 Difference
TR10	İstanbul	-0.484	-0.342	0.142
TR21	Tekirdağ, Edirne, Kırklareli	-0.013	0.039	0.052
TR22	Balıkesir, Çanakkale	-1.135	-0.199	0.936
TR31	İzmir	-0.602	-0.183	0.419
TR32	Aydın, Denizli, Muğla	-0.847	-0.327	0.520
TR33	Manisa, Afyon, Kütahya, Uşak	-0.612	0.044	0.657
TR41	Bursa, Eskişehir, Bilecik	-0.283	-0.034	0.250
TR42	Kocaeli, Sakarya, Düzce, Bolu, Yalova	0.168	0.216	0.048
TR51	Ankara	-0.594	-0.237	0.357
TR52	Konya, Karaman	-0.193	0.039	0.232
TR61	Antalya, Isparta, Burdur	-1.260	-0.950	0.310
TR62	Adana, Mersin	-0.742	-0.625	0.117
TR63	Hatay, Kahramanmaraş, Osmaniye	-0.054	0.903	0.958
TR71	Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir	-0.386	0.050	0.437
TR72	Kayseri, Sivas, Yozgat	-0.387	-0.205	0.182
TR81	Zonguldak, Karabük, Bartın	0.847	1.485	0.639
TR82	Kastamonu, Çankırı, Sinop	-0.456	-1.173	-0.718
TR83	Samsun, Tokat, Çorum, Amasya	0.930	1.515	0.585
TR90	Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane	-0.485	-0.478	0.007
TRA1	Erzurum, Erzincan, Bayburt	-0.540	0.466	1.006
TRA2	Ağrı, Kars, Iğdır, Ardahan	0.516	0.535	0.019
TRB1	Malatya, Elazığ, Bingöl, Tunceli	-0.688	-0.635	0.053
TRB2	Van, Muş, Bitlis, Hakkari	-0.395	-0.111	0.284
TRC1	Gaziantep, Adıyaman, Kilis	-1.158	-0.750	0.408
TRC2	Şanlıurfa, Diyarbakır	-0.987	-0.305	0.682
TRC3	Mardin, Batman, Şırnak, Siirt	-0.224	-0.263	-0.039

Source: Authors' Calculations

While in 2002 there were 21 Level-2 regions with technology gap, the sign is negative for 18 regions in 2011. In the period 2002-2011, technology gap narrowed in 24 out of 26 regions. It is encouraging that the regions TR21 (Tekirdağ, Edirne, Kırklareli), TR33 (Manisa, Afyon, Kütahya, Uşak), TR42 (Kocaeli, Sakarya, Düzce, Bolu, Yalova) and TR52 (Konya, Karaman) with some level of industrialization and scale have moved from negative to positive status in 2011.

It will be useful to take a look at the table below to see the relationship between trade deficit and technology gap at regional level. As can be seen in the table, the technology balance in İstanbul's foreign trade remained stagnant in the period 2002-2011. In other words, the difference between levels of exports and imports remained as it was and Istanbul maintained its status as a region exporting middle-low and importing middle-high technology. The cost of this for the year 2011 is a trade deficit of 62.5 billion $. While the overall situation remained unchanged, the reason for smaller trade deficit in 2002 against larger one in 2011 is increased production capacity and expanding volume of foreign trade.

Table 33: Relationship between Regional Foreign Trade Deficit and Technology Gap (2002, 2011)

	Region	Technology Level in EXPORTS		Technology Level in IMPORTS		Technology Balance in FOREIGN TRADE		FOREIGN TRADE DEFICIT (x thousand $)	
		2002	2011	2002	2011	2002	2011	2002	2011
TR10	İstanbul	2.839	2.884	3.323	3.226	-0.484	-0.342	-7,958,927	-62,491,570
TR21	Tekirdağ, Edirne, Kırklareli	2.915	2.668	2.928	2.629	-0.013	0.039	28,242	-311,139
TR22	Balıkesir, Çanakkale	1.999	2.445	3.134	2.644	-1.135	-0.199	37,147	-48,304
TR31	İzmir	2.363	2.754	2.965	2.937	-0.602	-0.183	489,438	-2,549,510
TR32	Aydın, Denizli, Muğla	2.110	2.537	2.958	2.865	-0.847	-0.327	485,318	897,617
TR33	Manisa, Afyon, Kütahya, Uşak	2.737	3.702	3.350	3.658	-0.612	0.044	138,659	695,969
TR41	Bursa, Eskişehir, Bilecik	3.305	3.486	3.588	3.519	-0.283	-0.034	872,110	-192,749
TR42	Kocaeli, Sakarya, Düzce, Bolu, Yalova	3.247	3.465	3.079	3.249	0.168	0.216	93,573	197,817
TR51	Ankara	3.139	3.282	3.733	3.519	-0.594	-0.237	-2,859,912	-5,320,284
TR52	Konya, Karaman	2.979	2.911	3.172	2.872	-0.193	0.039	-11,071	108,571
TR61	Antalya, Isparta, Burdur	1.887	2.055	3.147	3.005	-1.260	-0.950	87,205	437,301
TR62	Adana, Mersin	2.178	2.311	2.919	2.936	-0.742	-0.625	-1,284	-1,115,934
TR63	Hatay, Kahramanmaraş, Osmaniye	1.860	2.306	1.914	1.402	-0.054	0.903	-176,492	-3,725,779
TR71	Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir	2.539	2.887	2.926	2.837	-0.386	0.050	15,457	22,453
TR72	Kayseri, Sivas, Yozgat	2.851	2.768	3.238	2.972	-0.387	-0.205	-53,058	-285,082
TR81	Zonguldak, Karabük, Bartın	2.752	3.014	1.906	1.529	0.847	1.485	-425,991	-1,290,719
TR82	Kastamonu, Çankırı, Sinop	1.813	1.802	2.269	2.975	-0.456	-1.173	-2,480	24,941
TR83	Samsun, Tokat, Çorum, Amasya	2.643	2.770	1.713	1.255	0.930	1.515	-38,233	-499,723
TR90	Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane	1.446	1.561	1.931	2.039	-0.485	-0.478	375,210	1,778,246
TRA1	Erzurum, Erzincan, Bayburt	3.188	3.005	3.728	2.539	-0.540	0.466	-1,131	-50,941
TRA2	Ağrı, Kars, Iğdır, Ardahan	2.592	2.719	2.077	2.184	0.516	0.535	14,923	96,883
TRB1	Malatya, Elazığ, Bingöl, Tunceli	2.183	2.014	2.871	2.649	-0.688	-0.635	61,977	163,062
TRB2	Van, Muş, Bitlis, Hakkari	2.987	2.977	3.382	3.088	-0.395	-0.111	-8,450	286,468
TRC1	Gaziantep, Adıyaman, Kilis	2.200	2.274	3.358	3.024	-1.158	-0.750	-50,363	-2,974
TRC2	Şanlıurfa, Diyarbakır	2.020	2.446	3.007	2.750	-0.987	-0.305	-43,353	728,385
TRC3	Mardin, Batman, Şırnak, Siirt	2.755	2.639	2.979	2.903	-0.224	-0.263	10,163	797,277

Source: Authors' Calculations

However, the scale effect should not be missed here. While a technology gap -0.342 is a serious fact for İstanbul with foreign trade deficit of 62 billion, the export-import difference index of -1.173 for TR82 Kastamonu, Çankırı Sinop region with a trade deficit of only 25 million does not pose a serious risk for the country and the region. A similar problem is also valid for TR51 Ankara and TR31 İzmir provinces.

8. WHICH TURKEY? PEOPLE: PATTERNS OF EMPLOYMENT, EDUCATION, LABOUR FORCE AND THE MIDDLE-INCOME TRAP

8. WHICH TURKEY? PEOPLE: PATTERNS OF EMPLOYMENT, EDUCATION, LABOUR FORCE AND THE MIDDLE-INCOME TRAP

Development is not just stability attained in macroeconomic indicators at national level. Each country has its interrelated but different local and regional dynamics together with historically shaped social structures, internal dynamics and emerging competitive sectors. Hence, the sustainability of competitiveness on the part of countries depends to the extent that they can utilize the resources of their regions at different levels of development. In regions that use labour force, capital and technology efficiently, increases in productivity determine the level of economic and social development. Increase in infrastructure investments by the state does not have the only and final say about the issue; the quality of labour force and innovativeness of the region also have their implications on its competitive power.

Today, regions are not just passive structures as the practice area of policies formulated at national level. They have now turned as units that make active contribution to national policies. In the process, the objective of reducing inter-regional development disparities has left its place to sustainable regional development based on internal dynamics that, in turn, affect national development. Regions extending beyond national boundaries to compete in the global market introduced a brand new dimension to international competition. Today, any given region has to compete not only with other regions in the same country but with all other regions in the world. With regions facing competition in international arena, some are caught in poverty trap while others are threatened by the middle-income trap. Meanwhile, regions that could integrate with the global system promote to the status of higher income group. Eventually, there are countries with regions falling in each of these three categories.

As a result of the process of outward opening in the 80s, Turkey made significant progress in terms of economic growth. In the 70s, per capita income in the country was around 500 US$. In the 80s it reached 1,500$, varied in the range 2,500-3,000$ in the 90s, and attained the level of 3,000$ in the early 2000s. In 2001, per capita income of Turkey made it to 10,400$. However, due to wide discrepancies in the levels of development of regions, not all regions contributed the same to national development. With qualified labour force concentrating in specific regions which also enjoy technology-intensive production, provinces or regions capable of competing at both national and international levels could not emerge leaving aside very few. As a matter of fact, today only İstanbul can make it to the ranking of internationally competitive regions according to studies covering world's cities.

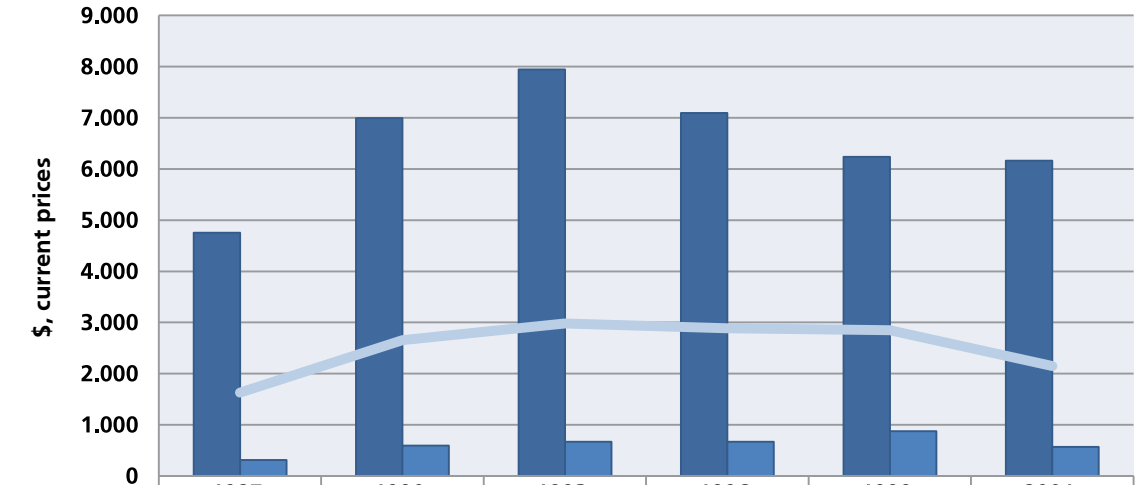
For example, one of the most important studies in this field belongs to the authors "Globalization and World Cities Study Group and Network – GaWC". With the exception of İstanbul, the GaWC enlists no other Turkish metropolis in the category of world cities. In this study, İstanbul appears as one of the Tertiary World Cities referred to as "Small World Cities"[17]. In a more recent study by Taylor (2010, İstanbul is shown among the first 30 cities in both general and financial index ranking.

8.1. Income Level of Regions: Overall Outlook

Modern theories of development tell us that the main reason for countries and regions with different income levels and living standards is differences in capital accumulation and productivity. In the long-term, differences in productivity are associated with technological change and structural transformation of economies. This transformation is made possible through the more effective use of information and the shift of natural, human and financial resources from low to high value added production activities18.

17 Beaverstock, J.V. et al. ; "A Roster of World Cities", Cities (The International Journal of Urban Policy and Planning), 1999.
18 Lin J.Y. ve Volker Treichel, Learning from China's Rise to Escape the Middle-Income Trap, World Bank, 2012.

Figure 32: Per Capita GDP (1987 - 2001)



	1987	1990	1993	1996	1999	2001
Kocaeli	4.757	6.992	7.947	7.096	6 236	6 165
Ağrı	316	597	667	667	878	568
Turkey	1.629	2.655	2.981	2.888	2 847	2 146

Source: *Based on TÜİK data.*

It is quite difficult to address inter-regional development disparities in Turkey in a historical process. Total and per capita income figures by provinces and regions are too old. Gross Domestic Product (GDP) data by provinces are available only for the year 2011 as the most recent one. According to per capita GDP values given by the TÜİK for the period 1987-2001, Kocaeli boasts the highest per capita income. At the beginning of this period per capita income of Kocaeli was 4,757 $, which increased to 6,165$ at the end of the period (2001). The rate of increase in this 14-years period is 30%. In the same period, Ağrı and Muş are the provinces with lowest per capita income. In 1987, per capita income in Ağrı was only 316 $, which became 568 $ after 14 years (increase by 80%). Throughout the period, the average per capita income in Turkey increased by 32%, parallel to that in Kocaeli. Again for the same period, average per capita income in Turkey amounted to 35-45% of per capita income in Kocaeli. While per capita income in Ağrı was 20% of Turkey's average per capita income in 1987, it increased to 26% in 2001. Per capita income in Kocaeli was 15 times that of Ağrı in 1987 and 11 times that of the same province in 2001. Hence, there is some convergence, but only in relative terms. In fact while the income difference between two provinces at the beginning of the period was 4,400$, it appeared as 5,600% at the end.

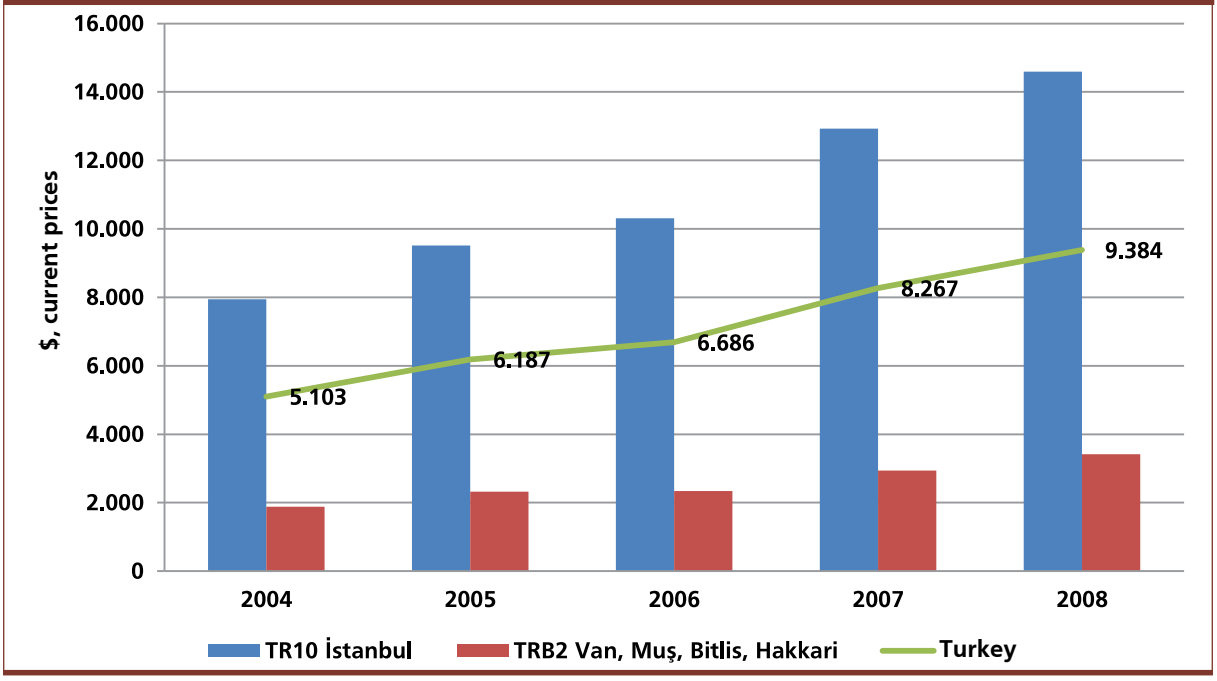
The endogenous growth theory having its significant place in the current development literature asserts that absolute convergence of regions is neither empiricable supportable, nor theoretically possible. Information and human resources constitute the driving force of development in this theory. The synergy triggered by accumulation of information and well-trained human resources create an enabling environment for development. The interaction between physical and human capital can yield productivity at increasing rates.[19] Similarly, the new economic geography theory holding that increasing economies to scale is possible further states that manufacturing industry concentrates in areas close to consumption centres where domestic market emerged and therefore ever-increasing development disparity between the centre and peripheral settlements is inevitable.

Per capita GVA values of Level-2 regions in Turkey seem to support the theories of inner growth and new economic geography.

19 Yeldan, The Economics of Growth and Distribution, Eflatun Publishing House, 1. Edition, Ankara, October-2009.

The TÜİK has not produced province-level GDP values since 2001 and, instead, gross value added (GVA) figures for Level-2 regions have been published for the period 2004-2008 In terms of per capita GVA, the TR10 (İstanbul) Level-2 region is again at the top of the list. In the period 2004-2008, per capita value added in İstanbul increased 1.8 times and approached the level of 15,000 $. In the same period, the TRB2 (Van, Muş, Bitlis, Hakkâri) Level-2 region with the lowest per capita GVA value moved from 1,877 $ to 3,500 $, an increase by 1.8 times again. The country average increased from 5,000 $ to 9,400 $.

Figure 33: Per Capita GVA Growth



Source: Based on TÜİK data.

While there is no change in income distribution by regions in relative terms, examining absolute values we find that income differentials between İstanbul and other regions and country average are becoming more pronounced. Indeed, while the difference between İstanbul and the TRB2 Level-2 region in terms of per capita GVA was 6,066 $ in 2004, it turned as 11,172 $ in 2008. The per capita GVA difference between İstanbul and country average was 2,840 $ in 2004, later increasing to 5,207 $ in 2008.

When we compare per capita GVA in 26 Level-2 regions with the country average for the period 2004-2008, we see that difference in-between has increased in all regions, in other words there was no convergence, with the exception of TR22 (Balıkesir, Çanakkale) Level-2 region. The difference between 7 Level-2 regions with per capita GVAs higher than the country average and others grew while 16 regions below the country average receded further. While per capita GVA values of TR32 (Aydın, Denizli, Muğla) and TR81 (Zonguldak, Karabük, Bartın) Level-2 regions were above the country average at the beginning, they fell below it at the end of the period.

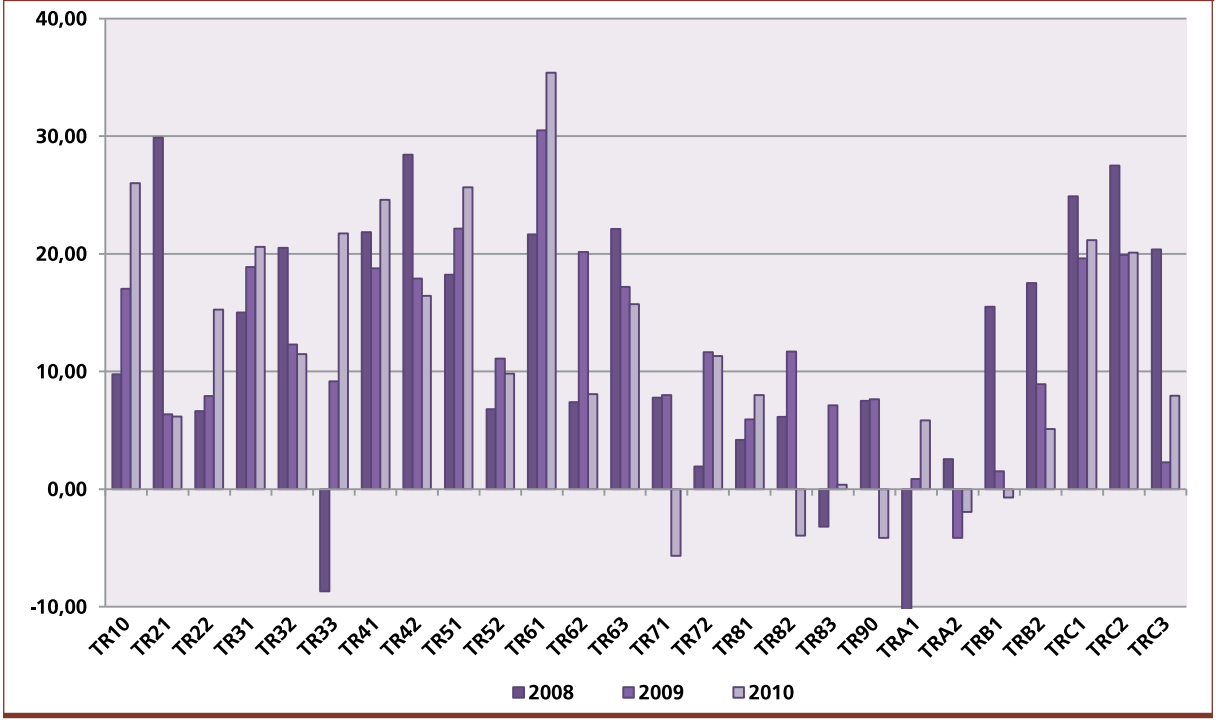
8.2. Relationship between Regional Population Movements and Middle Income Trap

Human resources capacity of regions is one of the principal factors affecting the level of income. The quality of regional human capital cannot be abstracted from external factors. Regions give migration out to other regions with stronger pull factors while receive migration from others which are under their impact. Hence, the human capital stock of regions emerges as a result of dynamic population movements which are reshaped by socioeconomic conditions.

Regions are at different levels of productivity since they differ in terms of the quantity and quality of their human resources. While those regions enjoying levels of development higher than the country average receive migration, others tend to lose their already limited qualified human resources to more developed regions. Nevertheless since developed regions also provide job opportunities to unqualified work force, they maintain their status as attraction centres for unqualified labour force as well.

In inter-regional migration movements, economic motives are among the leading factors that trigger migration. As labour supply is an important factor determining migration preferences of unqualified labour force, qualified labour force also considers, besides job opportunities, such external factors as housing, education and health infrastructure, social environments and climatic conditions when making their choice. Also important are the factors such as the existence of qualified labour force within a given labour stock and the state of local labour markets20.

Figure 34: Annual Rate of Population Growth in Level-2 Regions (in thousands)



Source: Based on TÜİK data.

Half of Turkey's GVA is created by only four regions. The Level-2 regions İstanbul, Ankara, İzmir and TR41 (Bursa, Eskişehir, Bilecik) account for a half of country's total income. According to 2010 data, the total population of these four Level-2 regions (25.6 million) corresponds to about 35 percent of country's total population. 5 least populated regions account for 7.5% of total population and claim 5 percent of national income. These Level-2 regions located in North-eastern Anatolia, Western Black Sea and Central Anatolia regions continue to lose population to developed regions of the country.

The income differential between İstanbul with the highest capacity in value added production and the Level-2 Region TRA2 with the lowest one widened further from 2004 to 2008. In 2004, TRA2 (Ağrı, Kars, Iğdır and Ardahan) Level-2 region could produce value added 40 times less than İstanbul in 2004. In 2008 it was 45 times less. Of course, population movements have their significant role in this widening gap.

20 Brezzi et al., "Determinants of Localization of Recent Immigrants Across OECD Regions" OECD workshop "Migration and Regional Development", OECD Publishing, Paris, June - 2010

Table 34: İstanbul - Turkey Population Ratio within the Last 40 Years (%)			
Years	Turkey	İstanbul	İstanbul/Turkey
1970	35,605,176	3,019,032	8.48
1975	40,347,719	3,904,588	9.68
1980	44,736,957	4,741,890	10.60
1985	50,664,458	5,842,985	11.53
1990	56,473,035	7,309,190	12.94
2000	67,803,927	10,018,735	14.78
2010	73,722,988	13,255,685	17.98

Source: Authors' Calculations on the basis of TÜİK data.

Within the last 40 years, the share of İstanbul in the total population of the country has increased consistently. In 1970, this population share was about 8.5 percent, rising to 18 percent in 2010. Within the last 40 years, the population of İstanbul grew by 317 percent while, in the same period, the total population of the country grew by 98 percent. In the 50s, the share of those born in Marmara and Aegean regions in İstanbul's total population was around 75 percent. This share first dropped to 50 percent in 1990 and to 40 percent in 2000. Istanbul receives migration mainly from Western Black Sea, Eastern Black Sea and South-eastern Anatolia regions. In the period 1985-1990, İstanbul, together with Kocaeli were the provinces with highest rates of in-migration; in the period 1995-2000 Tekirdağ replaced Kocaeli while İstanbul maintained its.21

In the period 2008-2010, the population of İstanbul grew steadily ant at increasing rates while there was population decrease in the Level-2 region TRA2 (Ağrı, Kars, Iğdır and Ardahan). In this period of three years there are two Level-2 regions losing population. The first one is Level -2 TRA2 and the other is Level-2 TRA1 region (Erzurum, Erzincan, Bayburt). In other Level-2 regions in Eastern and South-eastern Anatolia population growth continues as a result of high rates of fertility. Thus, turning back to regions TRA2 and TRA1, we can say that these regions lose population because of intensive migration out although rates of fertility are also high in these two regions.

Since population of the country is growing rapidly, expansion in the stock of labour force is only natural. Total labour force supply was 20.5 million in 1990, 23 million in 2000 and 25 million in 2010. İstanbul, Ankara and İzmir together have a share of 30 percent in total population while accounting for 32 percent of total labour force. These three metropols still provide relatively easier access to employment and encourages the concentration of population though in-migration.

Local labour markets are not developed in regions where agricultural production activities are intensive. Consequently, unemployed population in these regions move to other regions and this leads to the accumulation of unemployment in metropolises or provinces standing as regional centres. In a sense, provinces and regions reaching a specific economic size and thus stand as "centres of attraction" are, at the same time, "unemployment attraction centres". The concentration of unemployment in metropolises rather than in smaller cities is a factor that affects not only the social fabric but also the character of economic activities in these metropolises. Negative externalities caused by population movements constitute one of the leading factors that prevent manufacturing industries in metropolises from moving from low to high technology production.

Qualified labour force in underdeveloped regions move to developed ones for better working and living conditions. As a result of these population movements, a pool of more qualified labour force emerges in developed regions while, at the same time, there are improvements in scientific, technological and

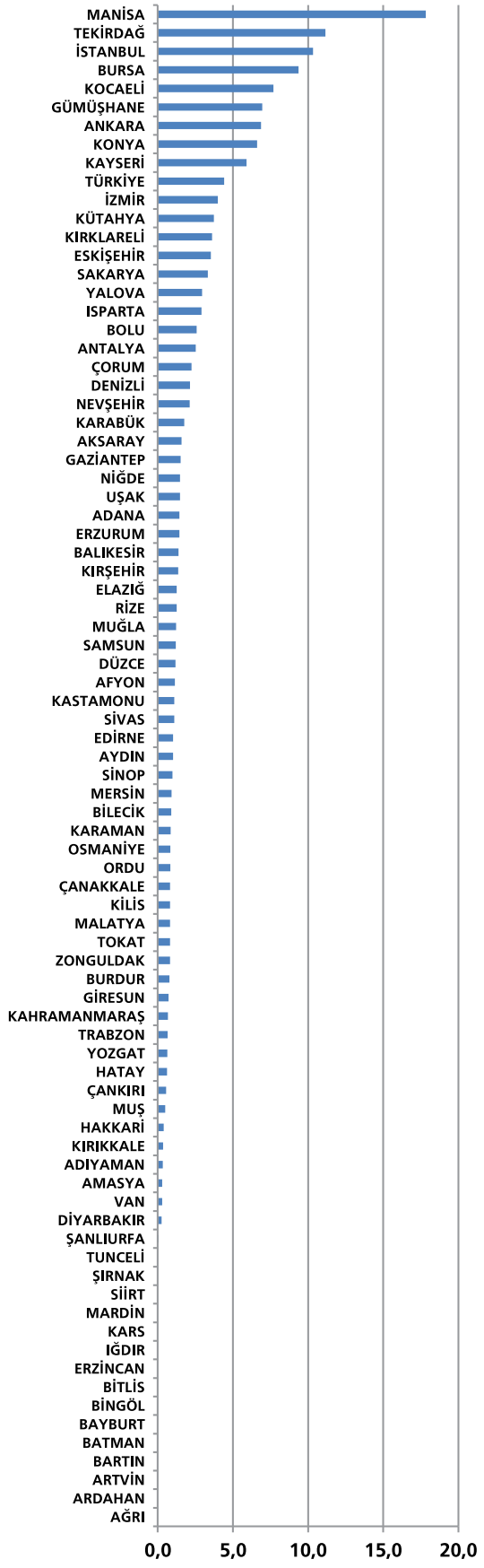
21 İstanbul Büyükşehir Belediyesi, 1/100.000 ölçekli İstanbul Çevre Düzeni Planı ve Plan Raporu, İstanbul, 2009.

entrepreneurial capacity. Regions that lose qualified labour force can ultimately gain from this process only if technological and entrepreneurial capacity built in developed regions returns back to their original region in the form of new social networks, investments or transfer of financial resources. Otherwise, investments in human resources made in regions facing problems in development will eventually be transferred to already developed regions as a result of migration and local stock of qualified labour will further drain.22

Apart from the number of full-time equivalent researchers as qualified labour force, the most basic R&D and innovative capacity indicator is the number of applications for trademark and patent. Given this, we see that there are trademark applications in almost all provinces of the country. When it comes to patent applications, however, there are 15 provinces in 2011 where there is no application at all. Provinces leading the list in this area are those with larger population and economic size. It is not surprising to see Manisa among the leading provinces in the ranking of provinces according to the number of patent applications given its high technology in exports and imports. Neither surprising it is to have İstanbul as the economic centre of the country at the top of the ranking in terms of the number of trademark applications. As can be seen in two charts below, almost all regions which remain at the bottom in terms of income levels are also those facing problems in "information" and "innovation".

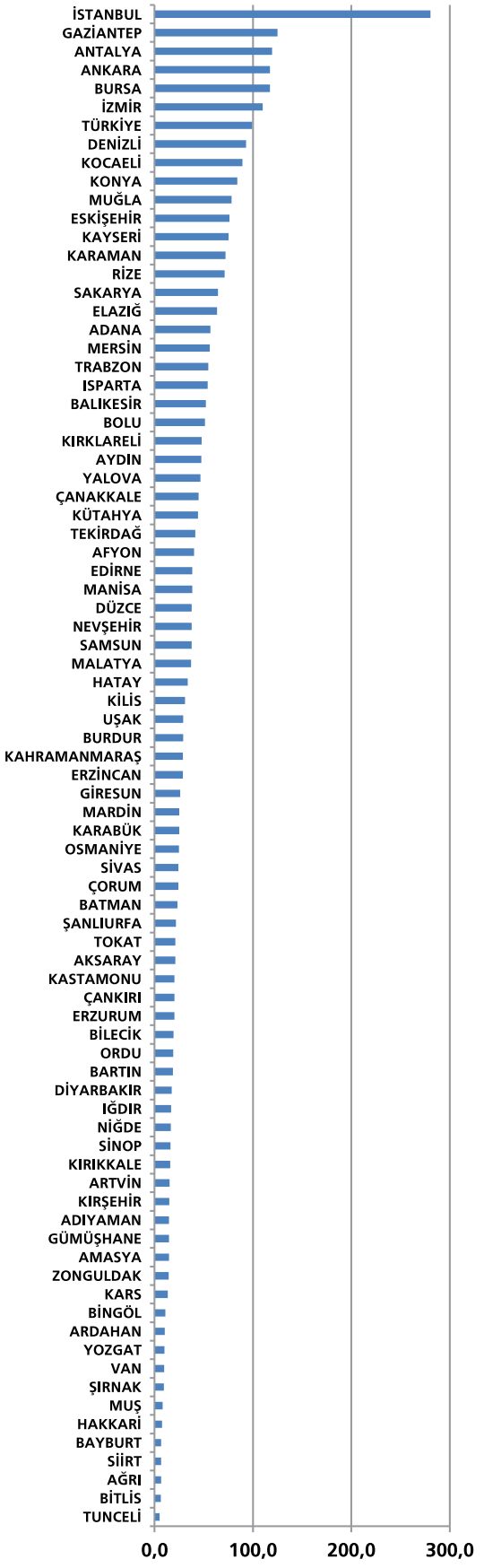
22 Dominique Guellec ve Mario Cervantes, International Mobility of Highly Skilled Workers: From Statistical Analysis to Policy Formulation, OECD Publishing, Paris, 2001.

Figure 35: Number of Patent Applications per 100,000 people (2011)



Source: Authors' Calculations on the basis of TÜİK and Turkish Patent Institute.

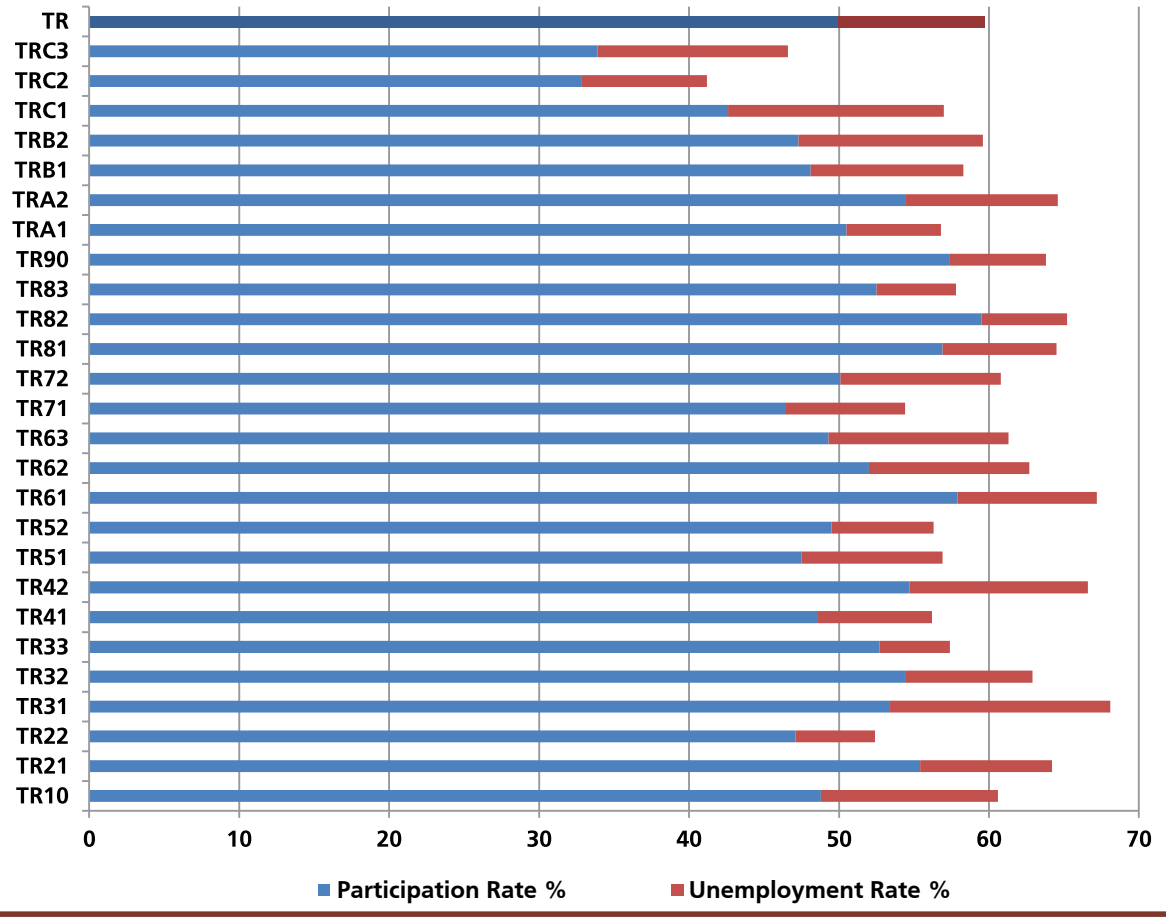
Figure 36: Number of Trademark Applications per 100,000 people (2011)



Source: Authors' Calculations on the basis of TÜİK and Turkish Patent Institute.

The chart below gives, for Level-2 regions, rates of labour force participation and unemployment. According to 2011 data, the rate of unemployment is 9.8 percent and labour force participation rate is around 50 percent in Turkey. Among Level-2 regions, the one with the highest rate of labour force participation is TR82 (Kastamonu, Çankırı, Sinop): 59.5 percent. It is also the region where the rate of unemployment is the lowest: 5.7 percent. In terms of per capita GVA this region ranks 18th in the list of 26 Level-2 regions. The region also gives migration out in net terms according to 2010 data.

Figure 37: Level 2 Labour Force Indicators



Source: Authors' Calculations on the basis of TÜIK data.

The regions of North-eastern Anatolia and Eastern Black Sea with high rate of labour force participation and low rate of unemployment are also among those regions giving migration. The stagnancy of local economies in these regions prevents the emergence of demand fitting existing labour supply in labour markets and this state of affairs cause the concentration of unemployment in big urban centres. In regions where manufacturing industry has not developed even to reach the level of low technology, one can notice "positive swelling" in labour force indicators deriving from agriculture-based economic structure.

The table becomes clearer if labour force participation rates in big cities are considered. According to 2010 data, labour force participation rate is 47.8% in İstanbul, 46.7% in Ankara, 50.1% in İzmir and 48.4% in Bursa. Given these figures, we see that İstanbul ranks 53rd, İzmir 39th, Ankara 61st and Bursa 51st among 81 provinces. In terms of rates of unemployment, on the other hand, İstanbul rants 9th with rate of unemployment of 14.3%, İzmir 6th with 15.1% and Ankara 25th with 12.1%. In regional attraction centres like Adana, Mersin, Diyarbakır, Şanlıurfa and Gaziantep which receive intensive migration, the rate of unemployment varies in the range 12.4% and 19%. These 8 provinces are among 25 with high rates of

unemployment. Bayburt, Artvin, Gümüşhane, Ordu, Rize and Giresun provinces, on the other hand, have lowest rates of unemployment with figures remaining as 6% or lower.

8.3. Relationship between Regional Income Levels and Urbanization

People, firms, job opportunities, sector of services and life opportunities tend to concentrate in specific regions. In the US, for example, about a half of country's national income is created in a tiny area that corresponds only to 4% of the surface area of the country. The most important reason for economic activities concentrating in specific reasons is economies of scale. For firms and individuals, economies of scale may be internal as well as external. Internal economies of scale have led firms to establish facilities with capacity just corresponding to optimum scale of production. However, internal economies of scale alone cannot explain urbanization and concentration of income generated in specific regions. Concentration of many firms in specific regions also makes it possible to benefit from economies of localization and urbanization. Along with urbanization there emerge different levels of agglomeration through interactions both within the urban area itself and with other urban systems. In urban centres where human capital based externalities are created, also emerge increasing economies of scale together with enhanced R&D and innovation capacity, which eventually leads to different income levels among regions at different levels of urbanization[23].

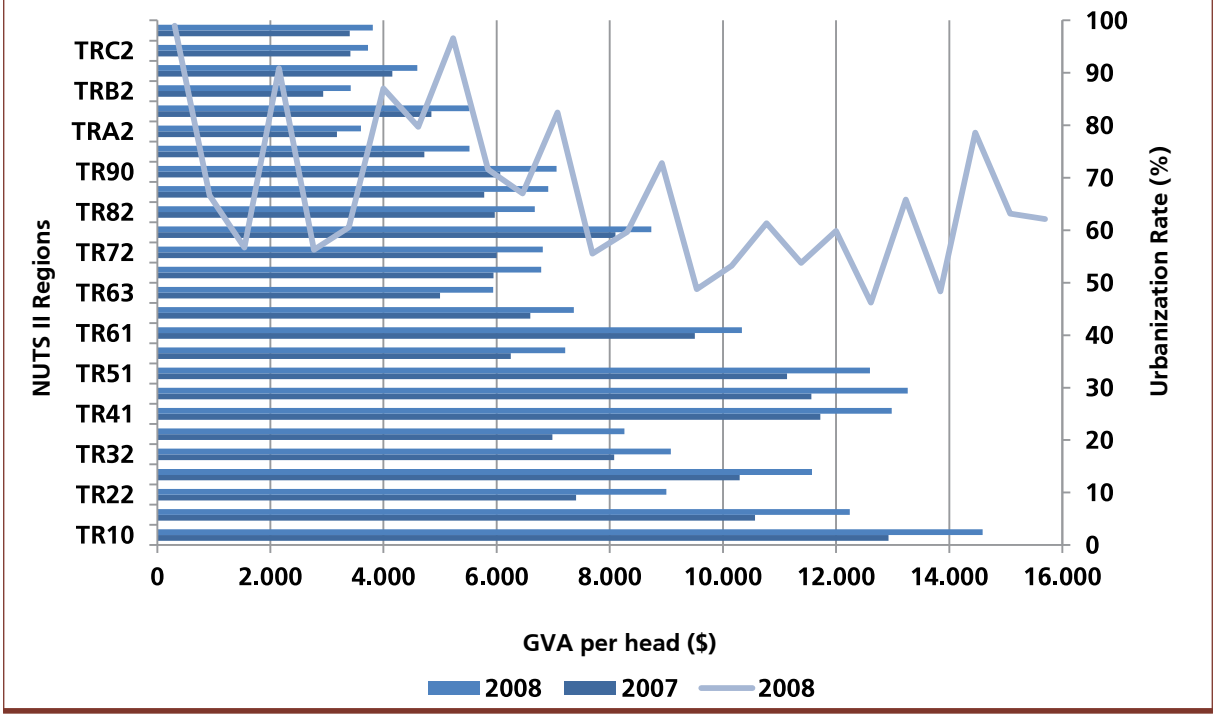
In settlement areas where the rate of urbanization is under 25 percent, economic activities based on agriculture or exploitation of natural resources are dominant. In such areas, there is need to support internal economies of scale of firms and enlarge the scale of production. In areas with rate of urbanization around 50 percent, firms in specific sectors tend to produce in the same space along with growing external economies. Sector-based clustering and localization economies must be supported in these regions. Turning to areas with high levels of urbanization (75 percent and over), economies of urbanization come to the fore. Support in such regions must be directed to sectoral diversification and concentration in service sectors.

In countries experiencing the process of industrialization, including Turkey, industrial centres are at the same time spaces where the level of urbanization is also high. There is close relationship between the spatial distribution of manufacturing industry and population and migration dynamics of regions. Until the 90s, provinces such as İstanbul, Ankara, İzmir and Adana were also leading centres of attraction for population with their developed manufacturing industry. Indeed, these four cities, together with Gaziantep were referred to as the "five leading attraction centres of the country" in *Ranking of Settlement Centres in Turkey* published in 1982.

However, within the last 20 years, along with rising trend in foreign trade as well as growth of the services sector associated with the former, Kocaeli, Sakarya, Bursa, Tekirdağ, Kırklareli, Manisa and Mersin joined the earlier growth poles as new centres of attraction. Meanwhile, as industrial production in central provinces has reached its natural boundaries, spatial reorganization of manufacturing industry became necessary. In this process, Denizli, Kayseri, Çorum and Kahramanmaraş emerged and "New Industrial Focal Points"[24].

23 Gill, I.S. ve C. Goh, Scale Economies and Cities, World Bank, 2010.
24 Özsan, Mehmet Emin and Dr. Metin Özaslan, "Küresel Kentler ve Ülkemiz Metropollerinin Küresel Kent Hiyerarşisindeki Yeri", Ankara, 2010.

Figure 38: Relationship between Incomes and Urbanization



Source: Authors' Calculations on the basis of TÜİK data.

The chart above shows per capita value added in level-2 regions for the years 2007 and 2008 and rates of urbanization for the year 2008. Istanbul is at the top of the list in both total and per capita value added. It is also at top with urbanization rate of 99 percent. TheLevel-2 region with lowest per capita value added is TRB2 (Van, Muş, Bitlis, Hakkari). Istanbul generates per capita value added four times greater than in TRB2. The regions with lowest rates of urbanization are TRA2 (Ağrı, Kars, Iğdır, Ardahan) and TRB2 (Van, Muş, Bitlis, Hakkari), which are also at the bottom of the list in terms of per capita income. While these two regions remain at an income level around 3,500$, their rates of urbanization are below 50 percent.

Following İstanbul, İzmir, Ankara and TR41 (Bursa, Eskişehir, Bilecik) are the Level-2 regions also with high rates of urbanization. Though having their large shares in country's total value added, these regions are still behind some other regions in respect to per capita GVA. In terms of per capita GVA, TR41 (Bursa, Eskişehir, Bilecik) ranks third, Ankara fourth and İzmir sixth. While the region TR42 (Kocaeli, Sakarya, Düzce, Bolu, Yalova) is second to Istanbul in the ranking, its rate of urbanization is around 80 percent.

The course of urbanization in Turkey proceeds in line with the projections of the new economic geography theory. According to the theory, the principal reason for the emergence of metropolises in developing countries is the sectoral structure with strong backward-forward linkages created by domestic demand-focused production. The theory conceptualizes this state through the impact of centripetal and centrifugal forces. Centripetal forces consist of external economies as well as backward-forward linkages and such market effects as spatial concentration of consumers. Centrifugal forces, on the other hand, derive from various factors including congestion, environmental pollution, rising land prices and recent status of attractiveness gained by regions with more moderate forms of competition.[25]

In Turkey, the effect of centripetal forces led to rapid urbanization. In all Level-2 regions the rate of urbanization has turned out as above 50 percent. According to the rates of urbanization given for 2011, there are 9 Level-2 regions with rates above 75 percent. With the exception of Gaziantep and Kayseri, other

25 Krugman and Elizondo, "Trade Policy and the Third World Metropolises", Journal of Development Economics, 1996.

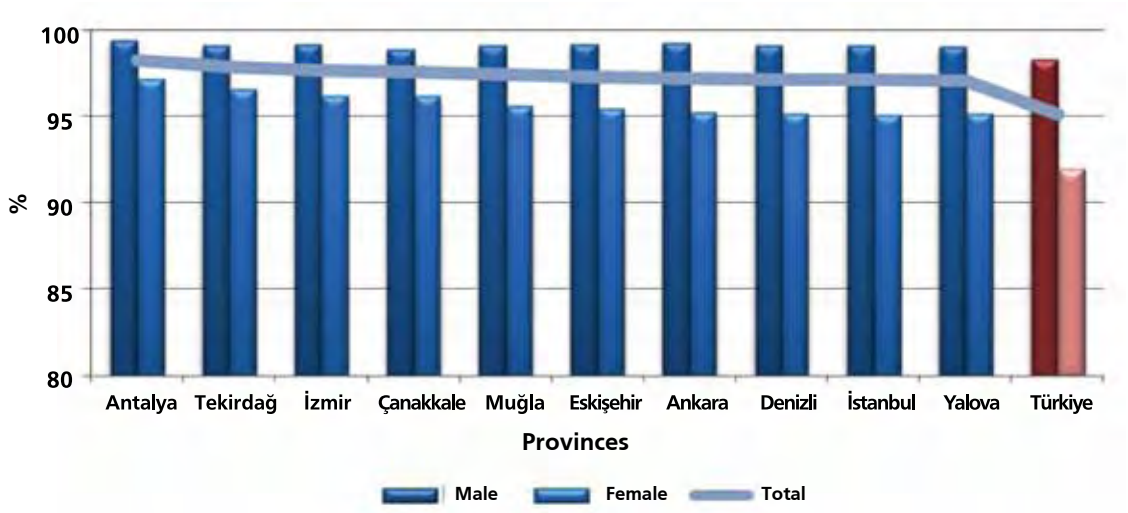
highly urbanized regions are in the western part of the country. These regions each having at least one metropolis are also those where industrial specialization and information economics can take place.

In the remaining 16 Level-2 regions the rate of urbanization varies in the range 50-70 percent. In these regions, there is need to create sectoral agglomeration and economies of localization. Also, for these regions to move from low to middle income level there is need to support competitive sectors and to create local production, labour force and finance markets.

8.4. Level of Education and Quality of Labour Stock by Regions

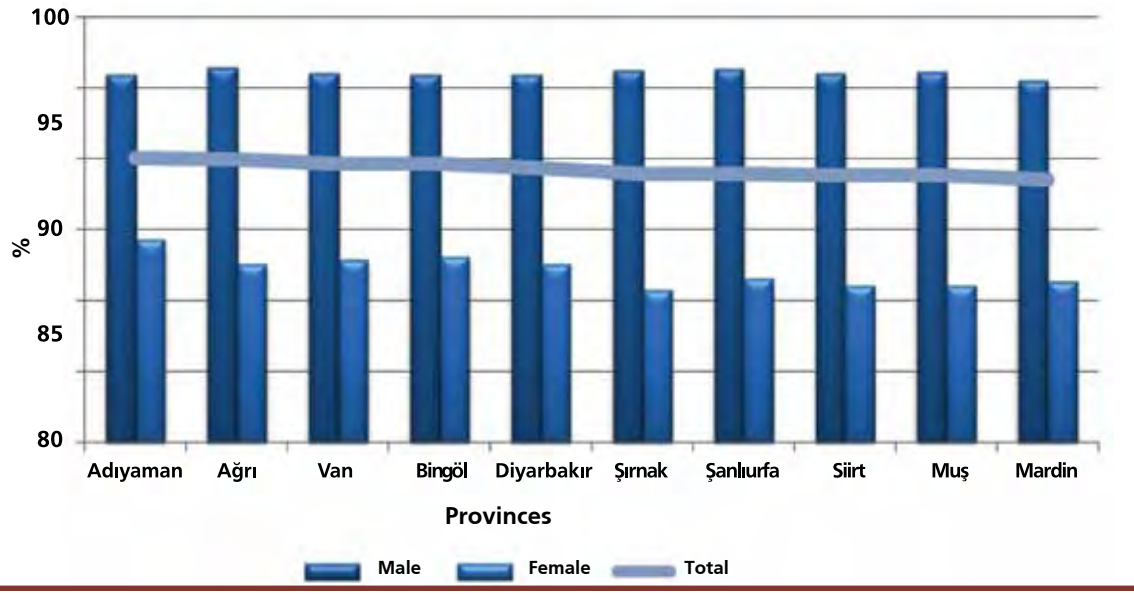
The basic indicator related to regions endowment with qualified labour force is the rate of literacy. Higher rates of literacy contribute to citizens' awareness and eagerness to participate to labour force in regions. The rate of female literacy is particularly important in that it indicates that the most important precondition for active participation of women to labour market is ensured. Two chart below shows provinces with highest and lowest rates of male and female literacy as of 2011.

Figure 39: Top 10 Provinces in Terms of Rate of Literacy (2011)



Source: Authors' Calculations on the basis of TÜİK data.

Figure 40: 10 Provinces with Lowest Rates of Literacy (2011)

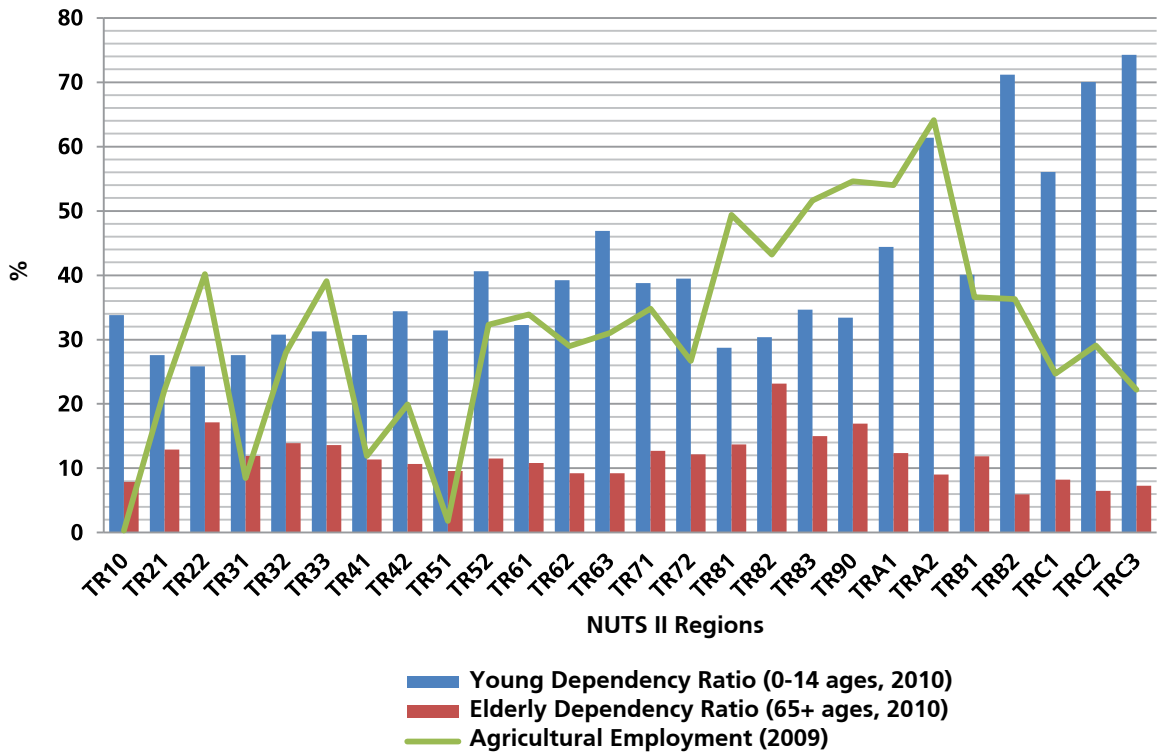


Source: Authors' Calculations on the basis of TÜİK data.

According to 2011 data the rate of literacy in Turkey is 95 percent. Male and female literacy rates differ. Taking the country as a whole, the rate of male literacy is 98.3% and the rate of female literacy is 92%. Antalya, Tekirdağ and İzmir are the provinces where the total rate of literacy is the highest, followed by Antalya, Ankara and Eskişehir. In female literacy, Antalya, Tekirdağ and İzmir share the top three. In provinces where the rate of literacy is the lowest, it falls below 90%. In Mardin, Muş and Siirt provinces, for example, the rate of literacy is around 89%. In many provinces of Eastern and South-eastern Anatolia, female rates of literacy are as low as 80%. Şırnak, Siirt and Muş are the provinces where lowest female literacy rates are observed.

The rate of male literacy is over 95% in all provinces of the country. Coming to female literacy, there are 38 provinces where the rates of female literacy are below 90%. Female literacy rates are above 95% in 10 provinces where total literacy rates are the highest. In the remaining 71 provinces, female literacy rates vary from 81% to 95%. As far as male literacy is concerned, the margin between the highest and lowest rates is not so wide; but it gets wider when it comes to female literacy. Indeed, while the difference between highest and lowest male literacy rates is around 3 percentage points, it is as high as 14 percentage points in females. It can therefore be concluded that while the regional distribution of literacy is balanced for males, it is not the case for females.

Figure 41: Rates of Dependency and Agricultural Employment in Level-2 Regions



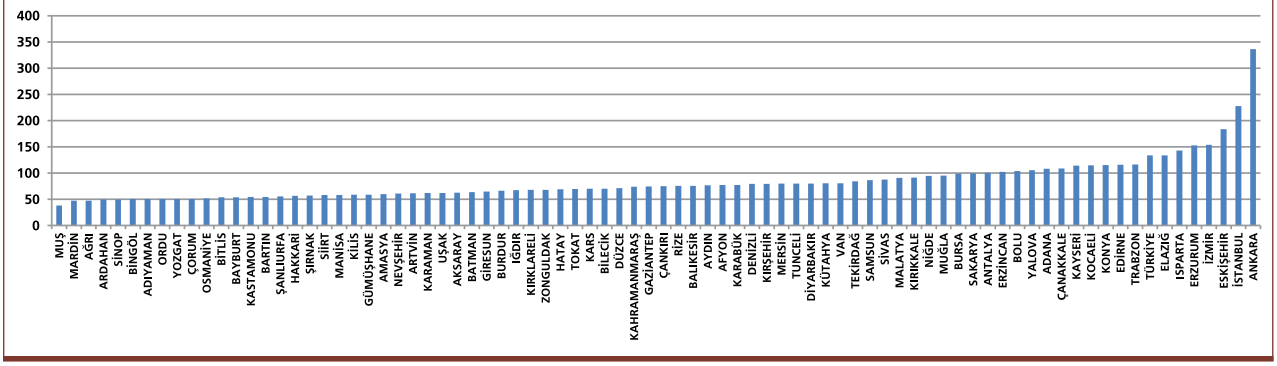
Source: Authors' Calculations on the basis of TÜİK data.

The chart above gives the young/elderly rates of dependency together with rates of agricultural employment. The Level-2 regions İstanbul, Ankara, İzmir and TR41 (Bursa, Bilecik, Eskişehir) with high incomes and rates of urbanization represent lowest rates of agricultural employment. The rates of agricultural employment are 0.3%, 1.8% and 8.5% in İstanbul, Ankara and İzmir, respectively. The region where the rate of agricultural employment is the highest is the Level-2 Region TRA2 (Ağrı, Kars, Iğdır and Ardahan) also with the lowest value added in the country. In this region, out of each 100 persons employed, 64 are in the sector of agriculture. This region is followed by TRA1 (Erzurum, Erzincan, Bayburt) and TR90 (Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane) as the second and third with rates of agricultural employment over 50%.

The high rate of young dependency indicates high rate of fertility and/or that the working age population (age group 15-64) cannot be hold in the region concerned. In general, this rate is high in the regions of Eastern and South-eastern Anatolia and low in Marmara and Aegean regions. In terms of the rate of dependency for the age group 0-14, the TRC3 (Mardin, Batman, Şırnak, Siirt) Level-2 region is at the top of the list. It is followed by Level-2 regions TRB2 (Van, Muş, Bitlis, Hakkâri) and TRC2 (Şanlıurfa, Diyarbakır). Young dependency rates are lowest in the Level-2 regions TR21 (Tekirdağ, Edirne, Kırklareli) and TR22 (Balıkesir, Çanakkale).

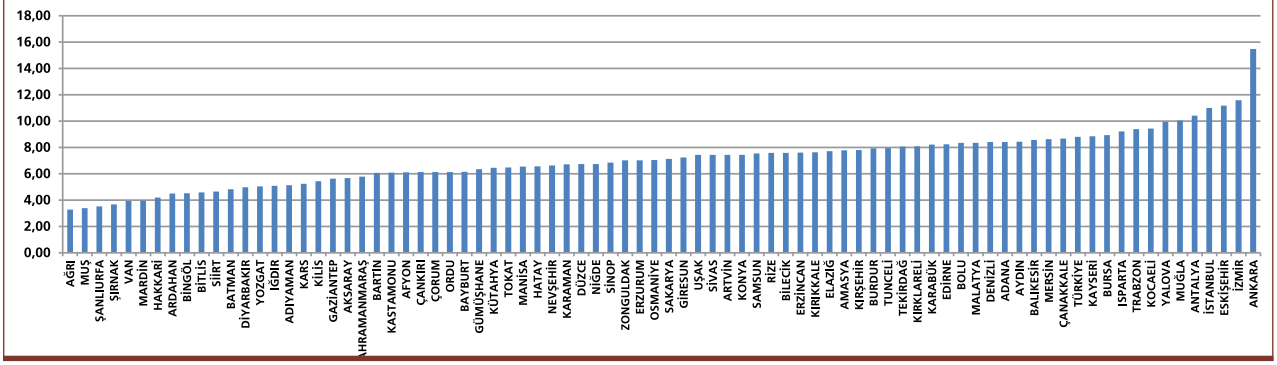
High rates of elderly dependency indicate that population at age 65 and over are concentrating in the region and/or population at working ages are moving out. The ranking of Level-2 regions in this respect is as follows: TR82 (Kastamonu, Çankırı, Sinop), TR22 (Balıkesir, Çanakkale) and TR90 (Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane). With highest rates of young dependency, the Level-2 regions TRC3 (Mardin, Batman, Şırnak, Siirt), TRB2 (Van, Muş, Bitlis, Hakkâri) and TRC2 (Şanlıurfa, Diyarbakır) have lowest rates of elderly dependency.

Figure 42: Proportion of Population with Postgraduate Degree to Population above Age 30 (in 0000)



Source: Authors' Calculations on the basis of TÜİK data.

Figure 43: Proportion of Population with Higher Education to Population above Age 22 (percent)



Source: Authors' Calculations on the basis of TÜİK data.

Studies covering OECD countries reveal that chances of employment of population groups with higher education and postgraduate degrees are higher than those labour force groups with lower education status. As OECD average, 84 out of every 100 persons with higher education and postgraduate degree are in employment. While this figure is as high as 90 in such developed Nordic countries as Sweden and Norway, it is only 70 in Turkey[26].

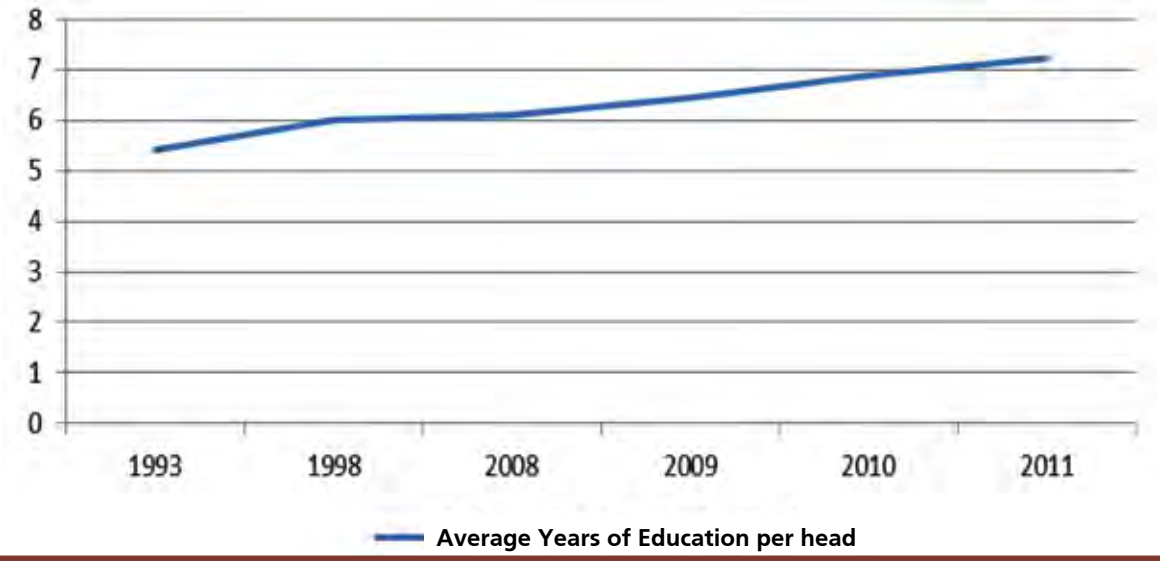
26 OECD, Education at a Glance, 2011.

Charts above gives the proportion of college or university graduates to population above age 22 and distribution of postgraduate degree holders per 10,000 people by provinces. In terms of the share of people with postgraduate degrees in total population over age 30, Ankara, Erzurum, Isparta, Eskişehir and Elazığ are the first five provinces. In Turkey, of population at age 30 and above there are 20.4 persons with postgraduate degree out of 10,000 people. The figure is 48.7 for Ankara, 39.8 for Erzurum and 35.9 for Isparta. At the bottom of the ranking we see Mardin, Hakkâri, Bayburt, Osmaniye and Amasya. In these provinces, the number of persons with postgraduate degree per 10,000 varies between 5.8 and 7. Examining the country as a whole in this regard, we find that in 25 provinces the number of persons with postgraduate degree is fewer 10 in 10,000 people.

In terms of the share of college or university graduates in total age 22+ population, Ankara, Eskişehir, İzmir, İstanbul and Antalya share the top five. In Ankara, of 100 persons at age 22 and over 17.4 are college or university graduates. In Eskişehir and İzmir it is 13 out of 100. Taking the country as a whole, 10 out of 100 have their higher education diplomas. The provinces having the fewest number of university graduates are Ağrı, Şanlıurfa, Muş, Van and Mardin. In these provinces, only 5 out of 100 have this educational status.

One of the main reasons why Turkey, as a middle-income country, cannot make it to the high-income group of countries is low labour productivity which stems from the level of quality of labour force. In fact, labour productivity in large cities of Turkey which profoundly influence the course of national economy lags far behind that in major cities of the world. While per capita labour productivity in New York is around 119,000 $ in New York, it is just 30,000 $ in İstanbul, Ankara and İzmir (3.5 times lesser). It is this higher labour productivity makes the US more competitive vis-a-vis European countries. Only London and Paris in Europe can cope up with the US in terms of productivity. Figures for other important European centres are as follows: Munich (71,000 $) and Ranstad metropolitan area (65,000 $).[27]

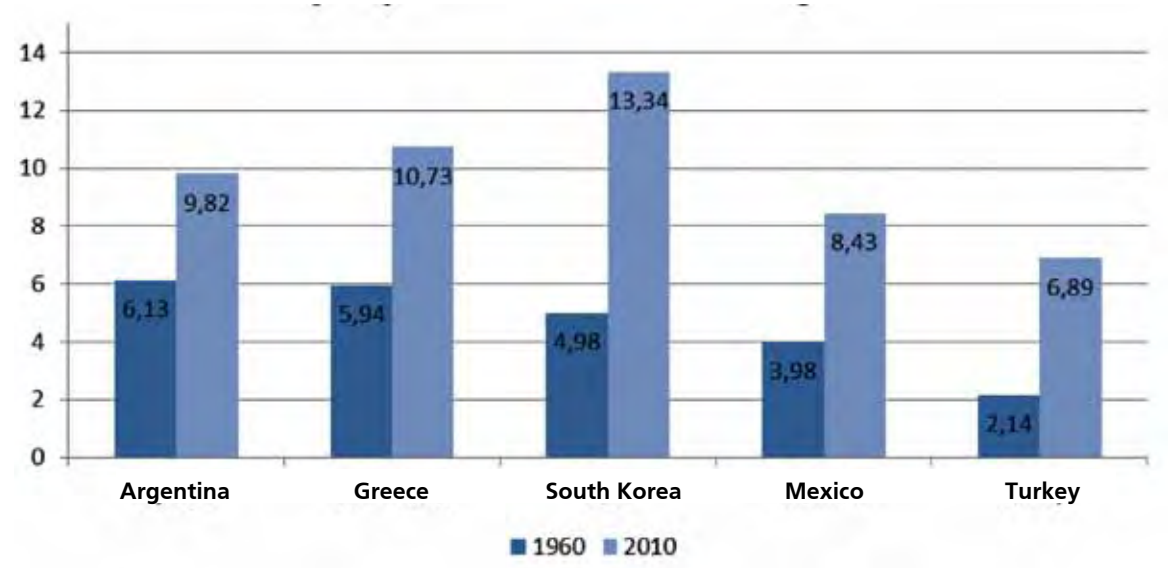
Figure 44: Average Years of Schooling per Person in Turkey



Source: Kavak, Yusuf, 2010, p. 94

27 OECD, 2006: 38

Figure 45: Average Years of Schooling in Selected Countries



Source: Kavak, Yusuf, 2010, p. 94

The charts above give the trend in Turkey on average years of schooling within the last 20 years and average years of schooling after a time period of 50 years in selected countries that were at the same level of income with Turkey back in 1960. Average years of schooling in Turkey increased from 2.14 in 1960 to 6 at the end of the 90s. The figure is 7.2 years for 2011. South Korea, which was in the middle-income trap in the 60s, launched reforms in its education system and increased average years of schooling from 5 years in the 90s to 13.34 in 2010. Like South Korea, Greece too is among those countries saving themselves from the middle-income trap through progress in education. On the other hand, Argentina and Mexico which share the same trajectory of development with Turkey exhibited low performance in this field with average years of schooling of 9.8 and 8.4, respectively, and remained in middle-income trap as Turkey is.

Measuring human capital endowment of regions is quite important in identifying the sources of regional growth. Technological advances can translate into sustainable economic growth only if complemented by adequate and qualified human resources. In its studies, the OECD employs three different methods in measuring human resources capital. The first one of these depends on assessing the quality of human capital stock in a country or region by calculating average years of schooling. The second method directly administers tests to individuals to identify the capacity to carry out specific economic activities. The third one seeks to measure the value of human capital stock by assessing the market value of skills and capacities that individuals have on the basis of wage levels.[28].

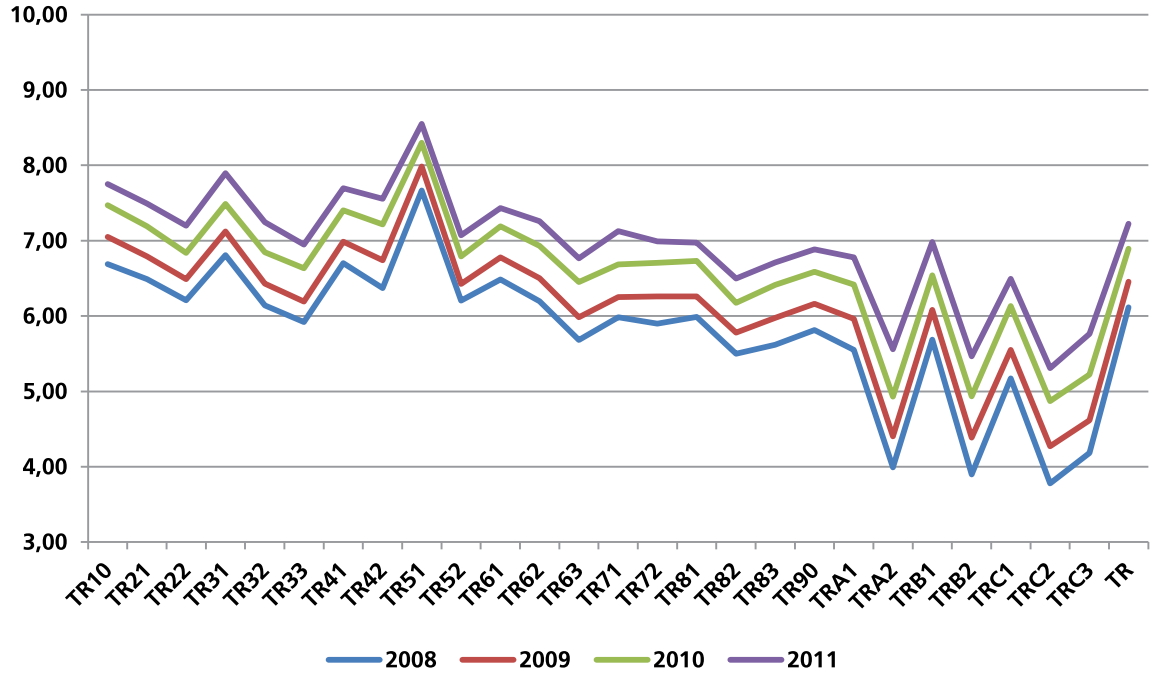
When measuring the quality of human capital stock in Level-2 regions in Turkey, the first of the methods mentioned above, average years of schooling per person was used. By using TÜİK education data for the period 2008-2011, total years in education in Level-2 regions were calculated on the basis of the number of primary, secondary and higher education graduates as well as those holding various post-graduate degrees. Average years of schooling per person was obtained by dividing total regional education stock by regional population over age 15.

28 OECD, Human Capital Investment; An International Comparison, Centre For Educational Research and Innovatıon, Paris, 1998.

Then, in the year 2008:

- The Level-2 regions TR51 (Ankara), TR31 (İzmir) and TR41 (Bursa, Eskişehir, Bilecik) enjoy the longest years in schooling with averages as 7.67, 6.81 and 6.7, respectively.
- While average years of schooling for the country is 6.11, there are 11 regions with years of schooling above the country average. The remaining 15 Level-2 regions have years of schooling below the country average.
- All Level-2 regions as the last five in the ranking are in Eastern and South-eastern Anatolia.
- Average years of schooling in TRC2 (Diyarbakır, Şanlıurfa), TRB2 (Van, Muş, Bitlis, Hakkâri) and TRA2 (Ağrı, Kars, Iğdır, Ardahan) as the last three remains shorter than 4 years.
- While the difference between Ankara which has the highest value and country average is 1.55 years, the difference between TRC2 level-2 region having the lowest value and country average is -2.34 years.

Figure 46: Average Years of Schooling in Level-2 Regions



Source: Authors' Calculations.

In 2009, while Ankara and İzmir maintained their positions at the top, the Level-2 region TR41 Level-2 was replaced by TR10 (İstanbul). While average years of schooling in Ankara approached 8, the figures for İzmir and İstanbul were 7.12 and 7.05 years, respectively. At national level, average years of schooling increased to 6.45. While nine Level-2 regions have average years of schooling above the national average, 17 regions remain under it. While above the country average in 2008, the regions TR32 (Aydın, Denizli, Muğla) and TR52 (Konya, Karaman) fell down in 2009. The five regions at the bottom of the list remained unchanged while their average years of schooling in increased to 4. The difference between Ankara and country average, which is 1.53 years, did not change much while the difference between the Level-2 region TRC2 and country average dropped to -2.18 years. All these suggest that there is some improvement with respect to regional disparities in average years of schooling.

As of 2010, there is no change in top three and bottom five. While average years of schooling in the country increased to 6.9, 8 regions are above the national average and 18 are below. The Level-2 Region TR22 (Balıkesir, Çanakkale) which had average years of schooling above the national average in the earlier year fell below in 2010. Since the national average is rising faster than the average in Ankara, the difference in-between decreased to 1.4 years. Meanwhile, with average years of schooling of 4.6, the Level-2 Region TRC2 Level-2 came closer to national average.

Average years of schooling in the country went beyond 7 years in 2011. In this year, all Level-2 regions left 5 years of average schooling behind. Average years of schooling in Ankara, İzmir and İstanbul were, respectively, 8.55, 7.9 and 7.75. With the TR32 (Aydın, Denizli, Muğla) Level-2 region moving above the country average, now there are 9 regions with average years of schooling above national average. In other words, convergence of regions in terms of average years of schooling is continuing. While the difference between Ankara and country average decreased to 1.33 years, that between the TRC2 and country average also dropped to -1.92 years.

Figure 47: Average Years of Schooling in Provinces, 2011

Source: Authors' Calculations.

Examining average years of schooling per person on the basis of provinces according to 2011 data, the top three are Ankara (8.55 years), Eskişehir (8.13 years) and İzmir (7.9 years). Average years of schooling in 28 provinces is higher than the country average while 53 provinces remain below this average. Ağrı, Şanlıurfa and Muş are three provinces where average years of schooling is the lowest. In Ağrı and Şanlıurfa it is shorter than 5 years.

9. RELATIONSHIP BETWEEN TRANSPORTATION INFRASTRUCTURE AND REGIONAL DEVELOPMENT

9. RELATIONSHIP BETWEEN TRANSPORTATION INFRASTRUCTURE AND REGIONAL DEVELOPMENT

In the context of economic geography, transportation infrastructure is an important issue in terms of both site selection for industries and urbanization. There is a rich literature on the relationship between transportation infrastructure and regional development. Transportation is also closely associated with socioeconomic development. The essence of this relationship consists of free movement of people and goods and ease in access to any region. Economic opportunities emerge to the extent that transportation infrastructure of a region provides for free mobility and easy access to any location.[29] Transportation systems capable of delivering effective and efficient services to people and enterprises encourage new investments and provide better and cheaper access to suppliers, markets and employment. As such, they generate economic and social opportunities and contribute to the level of welfare.[30]

Taking a look at the spatial distribution of transportation systems we see the following: while some regions benefit considerably from well developed transportation systems, others lag behind because of not so well developed transportation systems. Hence, investment in transportation infrastructure is regarded as an instrument of regional development particularly in developing countries. Still, it will be wiser to see transportation not as a factor sufficient *per se* to ensure economic development but a state which may hinder development when insufficient.

Transportation brings in economic returns over a wide spectrum. While the effects of some (those related to incomes) are direct, others (those related to accessibility) are indirect.[31] Road types constitute one of the factors affecting the level of development of regions. Development and improvements in transportation infrastructure proceed as two variables that mutually feed each other and affect growth.

Improvements in transportation systems particularly in developing regions can affect local markets. Basically, any improvement in transportation network affects some associated feature of the region concerned. Depending on the type of improvement (i.e. adding a new connection to a given network, enhancing the capacity of already existing connection or raising its standards) accruing benefits manifest themselves as reduced costs including expenditures in fuel, vehicle depreciation per kilometre, time saved. These improvements also mean increased accessibility of a given transportation network.[32] In sum, improvements in transportation network bring competitive advantage to the region where such improvements take place.

9.1. Highway Infrastructure and Regional Development in Turkey

Examining the types of roads in Turkey, a classification can be made as motorways, state and provincial roads and village roads. Motorway is a land road allocated to fast moving traffic where entry to and exit from is forbidden except at specific points, closed to pedestrians, animals and non-motor carriages and where traffic is subject to special control measures. State and provincial roads are main routes connecting important regional and provincial centres; land traffic to maritime, airway and railway transportation centres and ports. They also connect any country to its neighbours. Finally, village roads are lower standard roads that connect individual villages to each other and to larger settlements. The General Directorate of State Highways is in charge of planning, project development, construction, maintenance and operation of motorways and other state and provincial roads. Village roads are under the responsibility of Provincial Private Administrations.[33]

29 Rodrigue et al. (2009)
30 Kara, M. (2008)
31 Rodrigue et al. (2009)
32 Michael Iacono ve Davis Levinson, The Economic İmpact of Upgrading Roads, 2009
33 KGM, 2012

Figure 48: Shares of Asphalted Roads in Provinces of Turkey (percent)

Source: Authors' Calculations based on TUIK data

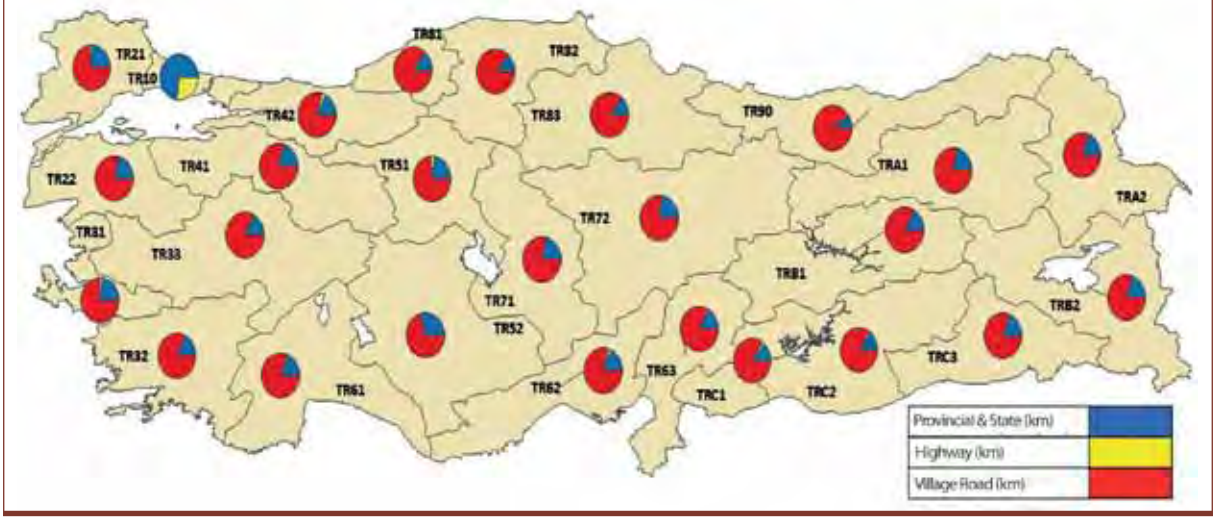
The length and types of motorways and state/province roads in Turkey are given below by years. Motorways are high standard and asphalted roads. The length of these types of roads in Turkey has increased by 60 percent since 2006 as a result of new investments in transportation. The share of this type of roads in total transportation network is one of the indicators of development adopted by the World Bank.

Examining annual series no significant change can be observed in the length of motorways. 211 kilometres have been added to the existing network since 2006. However, the plan is to construct 5,550 km long motorways until 2023.

Divided roads which are emphasized recently in transportation investments are 18,154 km long. Of this, 17,033 km are state and 1,121 km are provincial roads. So, together with motorways, it can be said that divided roads are 20,273 km long.

With respect to the distribution of types of roads by regions, the two regions with longest state road network are TR72 (Kayseri, Sivas, Yozgat) and TR 90 (Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane). Since roads in the Level-2 region TR10 (İstanbul) mostly remain within municipal boundaries, its road network appears relatively smaller in the table. As far as village roads are concerned the Level-2 region TR 90 (Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane) leads the list with 43,671.

Figure 49: Distribution of Types of Roads by Regions (2010)



Source: *Authors' Calculations on the basis of TÜİK data.*

The expansion and standards of transportation network in a given region are dependent to many factors including altitude, climatic conditions and vehicle intensity. For example, in TR90 Region where altitude and landscape are particularly important, village roads constitute 91.40% of transportation network.

Value added and employment effects of transportation services are observed not only on these two variables but on different sections of an economy. In other words, indirect effects of change become salient. For example, transportation firms procure a part of their raw materials from local markets; production on the basis of these raw materials creates additional value added and employment in local economy. Then, raw material suppliers purchase goods and services from other local producers. This spending at local level generates further value added and employment. In the same vein, household obtaining income from transportation services spend this for buying goods and services, which again contribute to local value added and employment. In conclusion, the effect of local spending on economy is not limited solely to output, income and employment generated by passenger and cargo transportation in narrow sense. Secondary effects are obvious.

Transportation displays its effects on economy in three ways as direct, indirect and associated economic effects.

Direct Economic Effects: Employment, value added, market expansion and cost saving as outputs of the level of accessibility provided by transportation.

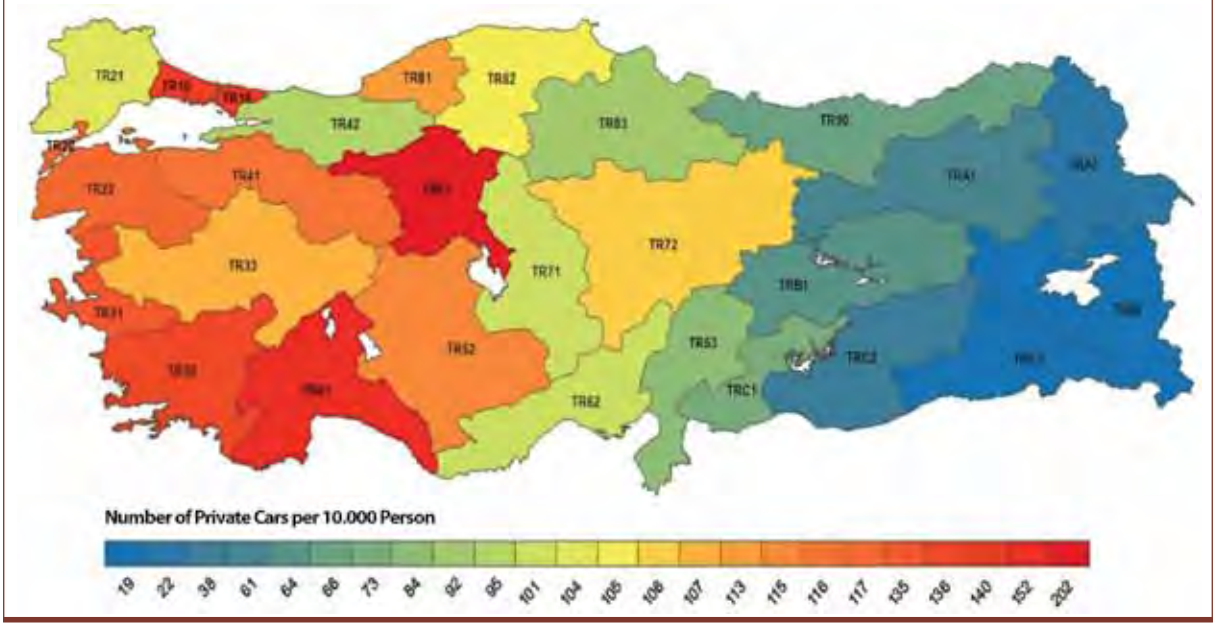
Indirect Economic Effects: Fall in prices of commodities, goods and services as a result of the effects of economic multiplier or diversification in available goods and services; emergence of secondary effects in terms of value added and employment associated with spending in transportation (since transportation activities are related with many economic sectors, these secondary effects extend over a wide area, i.e.: suppliers of office materials, equipment and parts; repair and maintenance services, insurance companies).

Associated Economic Effects: These are the effects deriving from the activities of those firms whose economic activities and business are largely based on efficient transportation services. For example, the iron-steel sector must pursue a cost-effective policy while importing iron ore that it is going to use in blast furnace and exporting processed final product in order to ensure conditions of competitiveness. These, in turn, require efficient transportation and port operations.[34]

34 Rodrigue, J-P., Comtois, C., Slack, B., "The Geography of Transport Systems", Hofstra University, Department of Global Studies & Geography, http://people.hofstra.edu/geotrans, (2009)

As a common need for passengers, cargo and information, a factor providing for the need to move from one place to another, mobility is one of the most basic and important characteristics of a given economic activity.

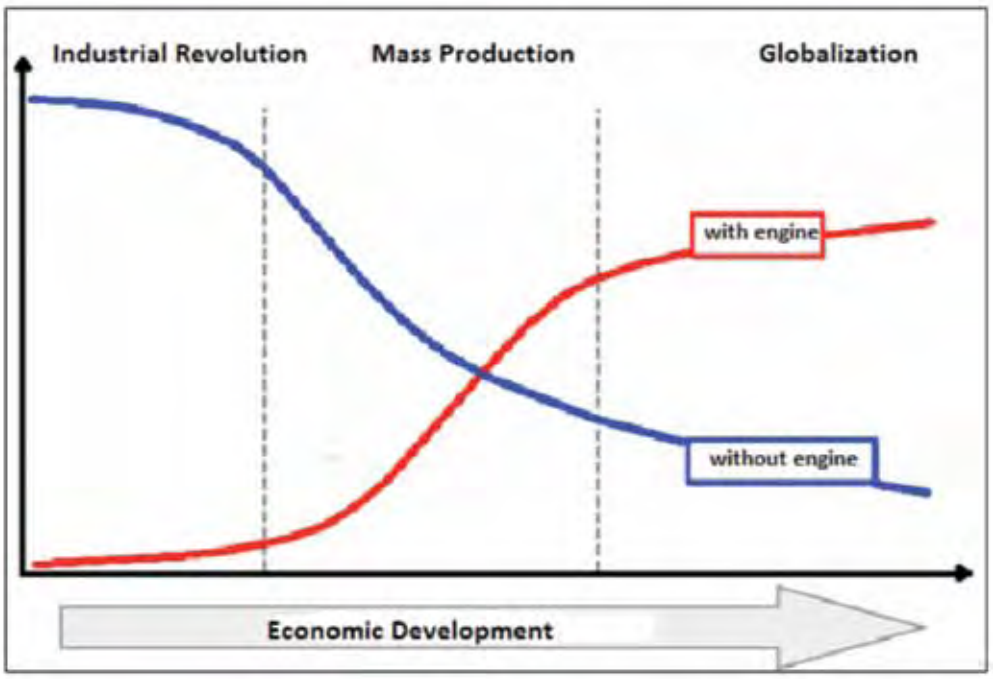
Figure 50: Number of Private Cars per 1000 People



Source: *Authors' Calculations on the basis of TÜİK data.*

The Number of Private Cars per 1000 People is one of the indicators pointing out to the level of mobility and development of a region. There is increase in the number of cars as a result of increased mobility and demand for transportation which go along with economic development. Examining Level 2 regions in Turkey, we find the number of cars is positively correlated to per capita GVA data. Not all economies and regions are at the same level of mobility since many regions and economies are at different stages of transition to more motorized modes of transportation.

Figure 51: Relationship between Economic Development and Mobility



Source: Narayanan, V. K (2001)

Figure 52: Province-Based Vehicle-Km Values (2010)

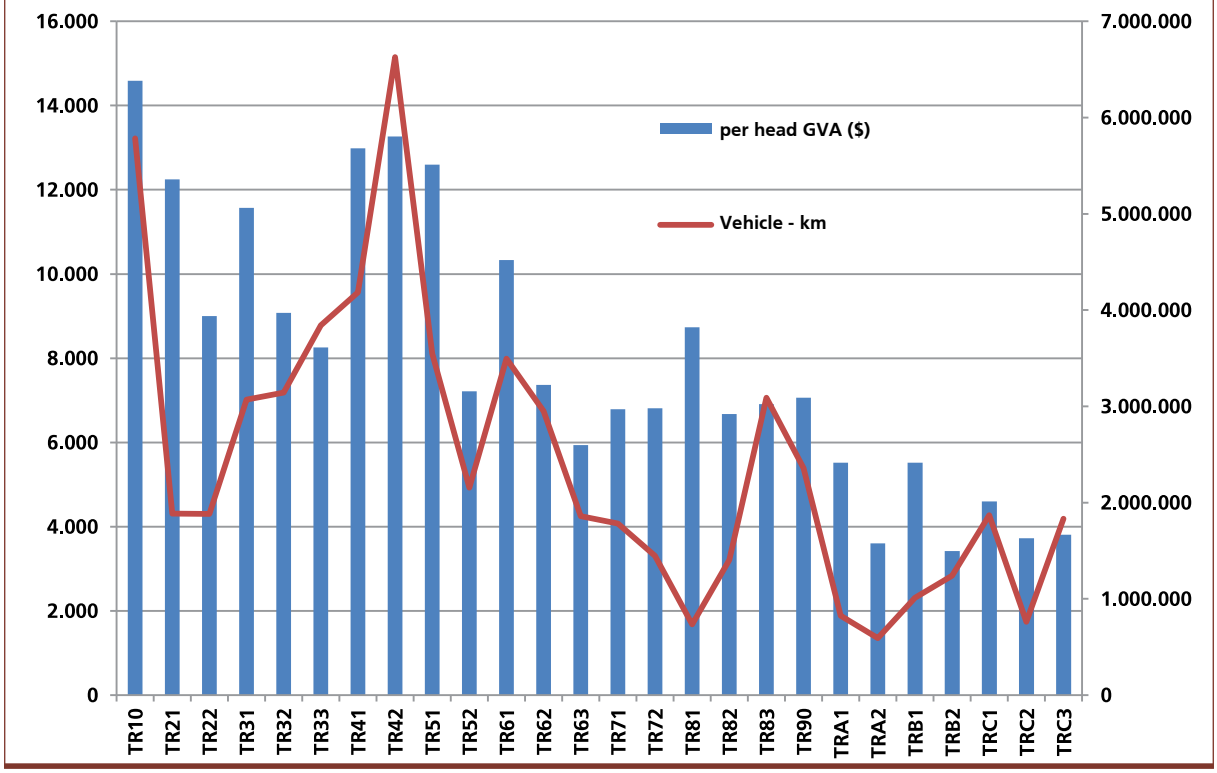
Source: *Prepared by the authors on the basis of State Highways Administration data.*

Vehicle-km is an indicator of vehicle mobility and the extent to which roads are used. Relative to economies with limited mobility, economies with high levels of mobility enjoy more opportunities in carrying the process of development forward. While limited mobility puts a barrier to development, rising level of mobility acts as a catalyser in development. Hence, mobility is one of the reliable indicators of development. In this context, mobility can be considered as an industry that renders services to clients, employs people, pays wages and also obtains income by making capital investment. From this angle, the importance of transportation sector can be assessed in macroeconomic and microeconomic terms;

At macro level (the importance of transportation for the economy of the regions as a whole), transportation and mobility are associated with the level of output produced, employment and national income. In many developed countries, the share of transportation in GDP varies from 6% to 12%.

At micro level (the importance of transportation for a specific section of economy), transportation is associated with producer, consumer and production costs. It is possible to assess the effects of investments in transportation separately for each individual sector. On average, 10% to 15% of household expenditures go to transportation and in manufacturing industry transportation has a share of 4% in each unit of output. However, this share changes considerable as one goes down to sub-sectors.

Figure 53: Relationship between Per Capita GVA and Vehicle-Km (2008)



Source: *Prepared by the authors on the basis of TÜİK and State Highways Administration data.*

Examining per capita gross value added (GVA) figures of regions shown in the chart above as with high values of vehicle-km we find that per capita income is positively correlated with mobility. For example, per capita GVA values of TR10 (İstanbul) and TR42 (Kocaeli, Sakarya, Düzce, Bolu, Yalova) regions are, respectively, 14,591 $ and 13,265 $ and their vehicle-km values are 5,784,628 and 6.629.535 in contrast with per capita GVA of 3,601$ and vehicle-tm value of 593,552 in TRA2 (Ağrı, Kars, Iğdır, Ardahan).

Figure 54: Region-Based Ton-Km Values (2010)

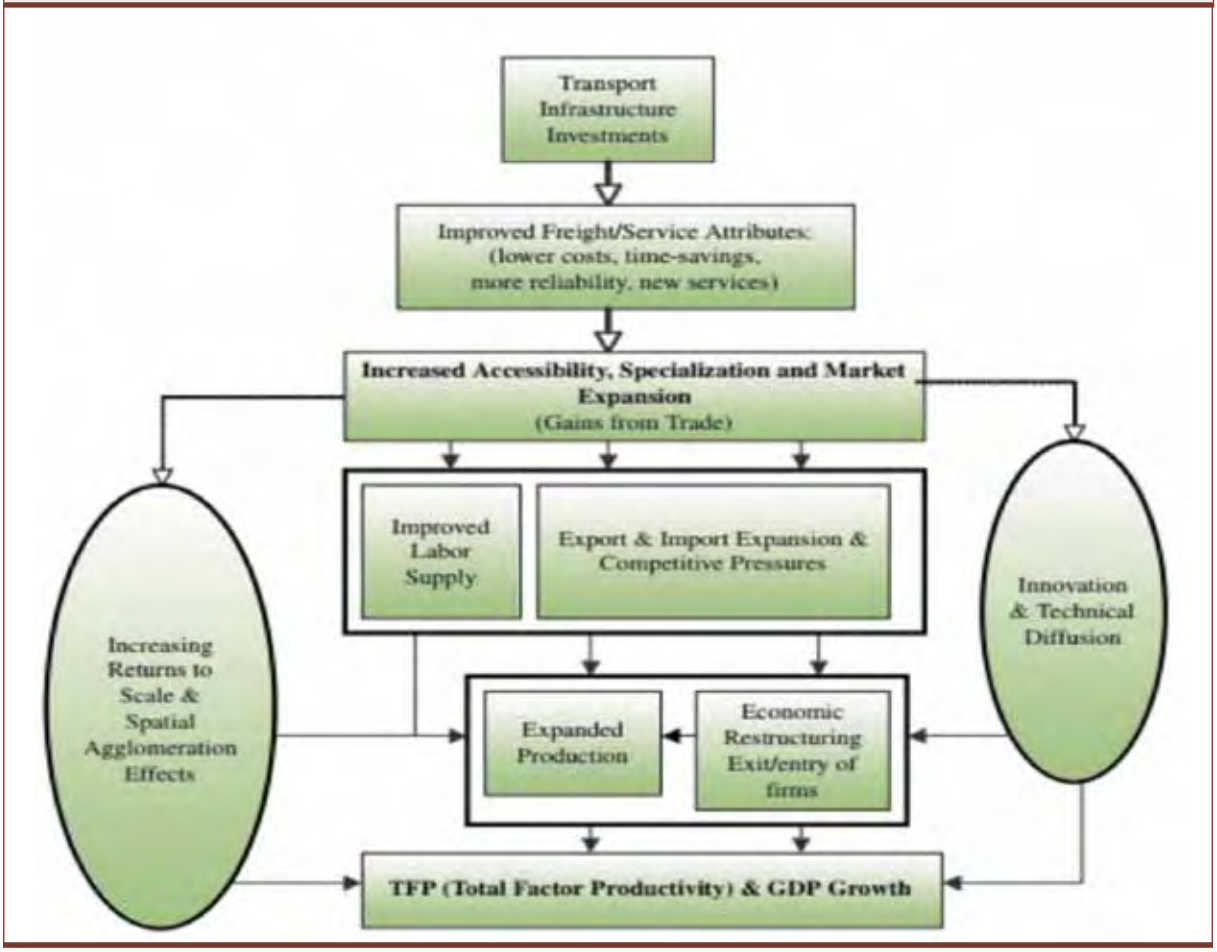
Source: *Prepared by the authors on the basis of State Highways Administration data.*

Ton-Km value is one of the indicators of mobility and trade volume. The regions TR10 and TR42 are at the top of the list in terms of cargo-km values. In the regions TR83 and TR62, it is ports that push ton-km values up. Regional Analysis of Railway and Airway Infrastructure in Turkey

The figure below gives a perspective concerning the working mechanisms and processes of wider economic effects of investments in transportation infrastructure. The figure is the updated form of the work "Forward Linkages of Transportation Infrastructure" by Williamson (1974) ([35]) and O'Brien (1983)([36]). Lower costs and higher accessibility ensured by improvements in transportation infrastructure bring along positive changes in marginal costs of enterprises located at the supply side of transportation sector, household mobility and demand for goods and services.

In the short-term, these changes affect, within market mechanism, employment and amounts of inputs and outputs through inner waves. In the course of time and with dynamic growth effect originating from the working of market mechanism, change in transportation services sets in motion many interrelated economic processes to bring about sectoral, spatial and regional effects, which all add up to increased total productivity.

Figure 55: Investments in Transportation Infrastructure and its Economic Effects



Source: OECD (2009)

Taking advantage of reduced costs as a result of investments in transportation, increased accessibility

35 Williamson, Jeffrey G. 1974. Late Nineteenth-Century American Development: A General Equilibrium History. London: Cambridge University Press.

36 O'Brien, Patrick 1983. "Transport and Economic Development in Europe, 1789-1914" in Railways and the Economic Growth of Western Europe,(ed.) Patrick O'Brien, 1-27, London: Macmillan.

and development in services sector, companies using transportation networks find it easier to reach even wider markets. This market expansion facilitates interaction among economies and regions with different characteristics; as this interaction triggers the level of trade and specialization, the final result is increase in total output. Growth itself follows higher levels of specialization and expanding volume of trade. As opportunities for importing and exporting goods multiply, effects from different economic channels set in for both production and factor markets, which have similar implications as tax abatement and expanded trade volume.

First of all, increase in exports brings along higher output, which reduces fixed operational costs and increases productivity. Secondly, there is competitive pressure on local prices together with rising level of imports. This pressure, besides eliminating monopoly rent, brings along increase in productivity. As they give effect to bold production processes, producers change the shape of economy by reducing production costs and ensuring higher productivity. Thirdly, there will increases in the amount of business and factor inputs in the market as a result of lowered transportation costs and increased accessibility. Manufacturing firms incur lower costs as they can recruit and employ more qualified labour from distant places. This means increased labour supply. The same effects are also true for land use and factor markets. Improved transportation infrastructure opens new land to use economically.

Finally, the two oval boxes displayed in Figure 55 present two mechanisms related to the effects of investments in transportation. One of them deals with "innovation and technological diffusion" in economy and the other addresses spatial arrangements. From the window of improved transportation infrastructure, these two mechanisms sets conditions which improve the overall performance of economy while enhancing, at the same time, total factor productivity and inner growth.

The inner growth effect of improvements in transportation is to the extent that new information can be derived from developments taking place and that information can be commercialized. Under the contemporary information economics, firms are supposed to cope up with newly emerging costs. Producers develop solutions in regard to these costs emerging as a result of changing conditions by tracing changes in goods and levels of technology, formulating new competitive strategies and implementing these strategies as fast as possible to maintain and increase their market share.[37] For example, producers try to reduce variable costs by taking their places in clusters. Such economic structures, in turn, require improvements in transportation infrastructure.

Railway systems as another mode of transportation are the outcomes of industrial age. They played a leading role in the economic development of Western Europe, North America and Japan. As a very significant development in transportation technology, railway networks introduced novelties to passenger and cargo transportation and the most important of these is related to the time variable. While maritime routes were also used in heavy cargo transport, timely arrival and delivery was a serious problem. Railway networks helped in this and facilitated the planning of economic activities including production and distribution with reliable and consistent time schedules. [38]

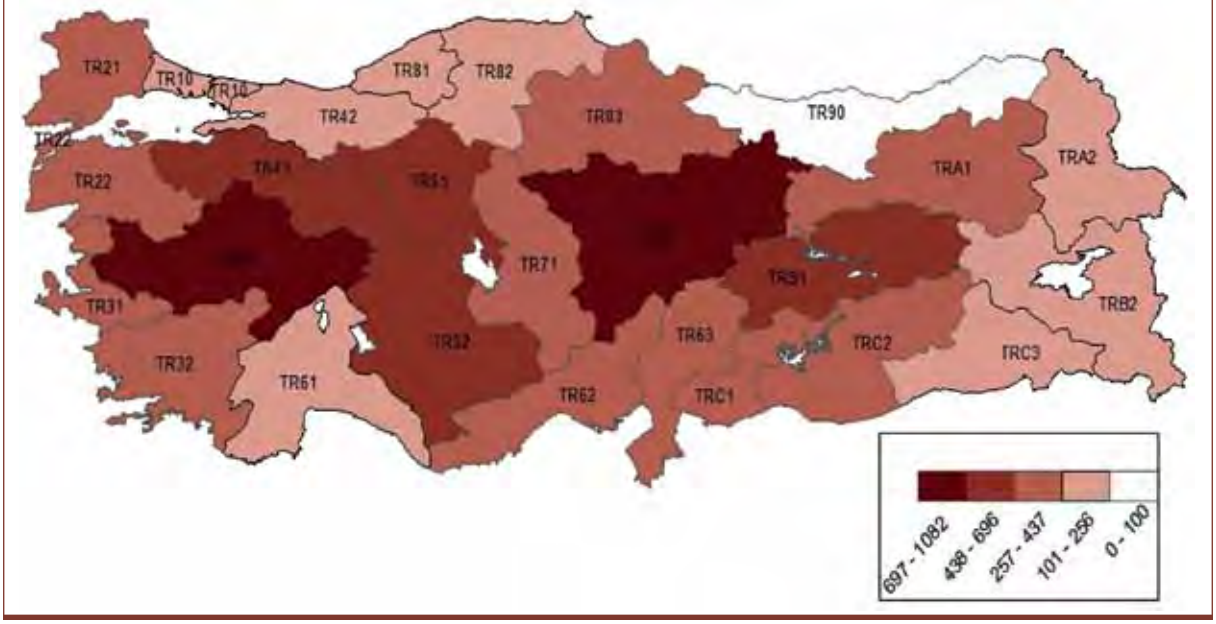
Railways that have been used effectively since the Industrial Revolution have some advantages over land roads including safety in the first place. Having rails and being less vulnerable to climatic conditions (i.e. snow, frost, fog, and rain) are the factors that add to safety and comfort. Its harmful effects on the environment are much more limited compared to other means of land transportation. Gases emitted by fuels used in vehicles and industrial wastes in corresponding sectors pollute the environment. The share of railways in air pollution is only 5% due to the use of diesel engines against 85% by land roads. Difference in terms of energy consumption is another factor. In Turkey transportation sector uses 20% of total energy used in the country. Energy consumption per unit of work in railways is 4 to 7 times less than in land transportation.[39]

37 Hage, J. and C. Alter 1997. "A Typology of Interorganizational Relationships and Networks" in Contemporary Capitalism,(eds.) J.R. Hollingsworth and R. Boyer, New York; Cambridge University Press. 94-126.

38 Rodrigue, J-P., Comtois, C., Slack, B., "The Geography of Transport Systems", Hofstra University, Department of Global Studies & Geography, http://people.hofstra.edu/geotrans, (2009)

39 Sekizinci Beş Yıllık Kalkınma Planı , Ulaştırma Özel İhtisas Komisyonu Raporu Demiryolu Ulaştırması Alt Komisyonu Raporu

Figure 56: Length of Railway Network in Regions of Turkey



Source: *Authors' Calculations on the basis of TÜİK data.*

Examining the length of railway networks in regions, we find that TR72 (Kayseri, Sivas, Yozgat) and TR33 (Manisa, Afyon, Kütahya, Uşak) have the largest networks. TR90 is the poorest in this respect.

Today, the share of railways in total transportation is only 4%, while land transportation has its clear dominance by 94%. In the EU countries, on the other hand, the share of rail transportation is around 8% and they are not content with this figure. The target for the year 2010 is to bring it up to the interval 16-20%.[40]

Figure 57: Airports in Turkey

Source: *Authors' Calculations on the basis of TÜİK data.*

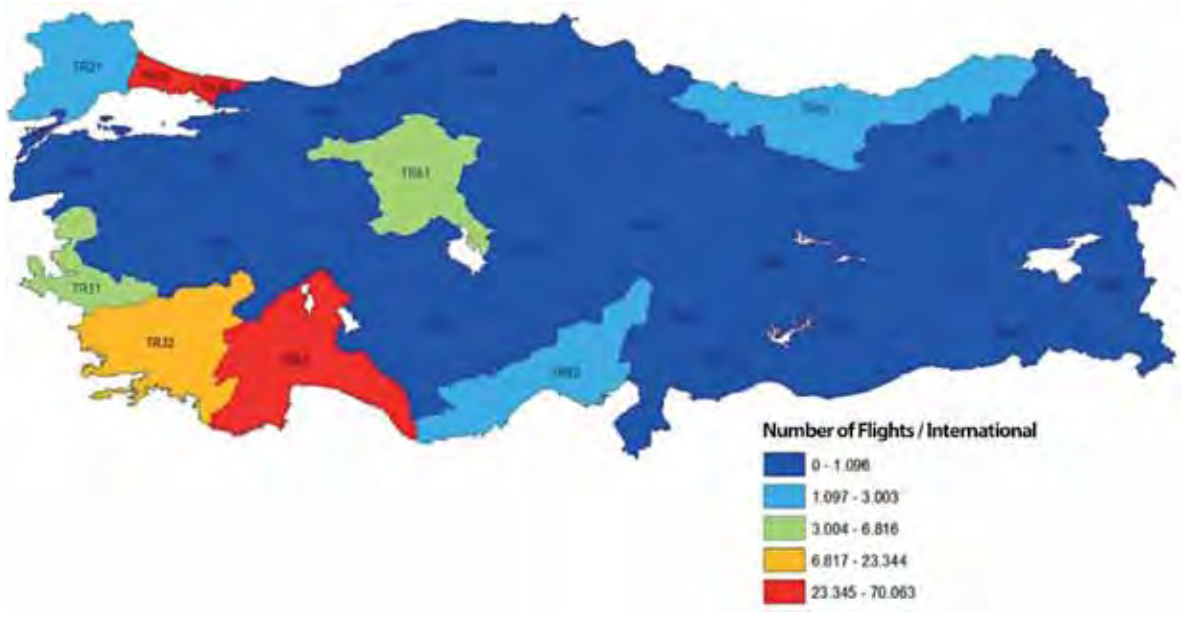
40 Acer A. (2004),"Turkey' de Demiryolu Taşımacılığı ", Logistical , Sayı 2,

Air freight turns out to be the best option relative to other modes of transportation in case cargos have some specific characteristics and when speed, ease, quick delivery and transformation are primary considerations. However, fees charged and fuel costs are exceptionally high.[41]

Figure 58: Number of Planes Landing and Taking off (Domestic)

Source: *Authors' Calculations on the basis of TÜlK data.*

Figure 59: Number of Planes Landing and Taking off (Foreign)

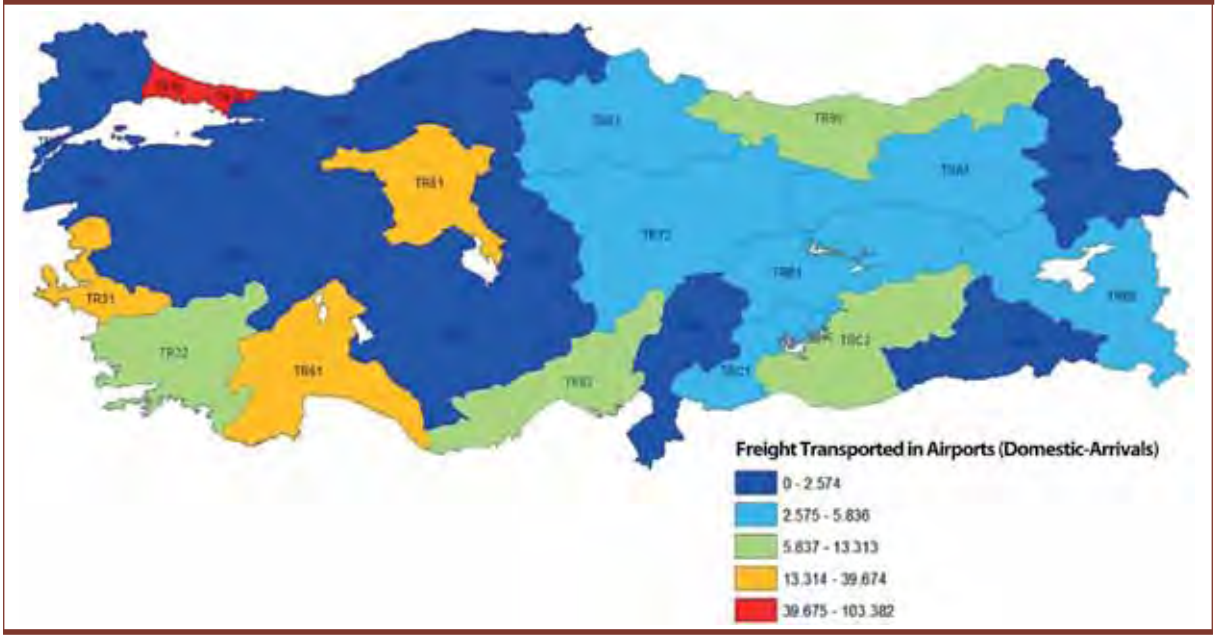


Source: *Authors' Calculations on the basis of TÜlK data.*

41 Karadoğan (2012)

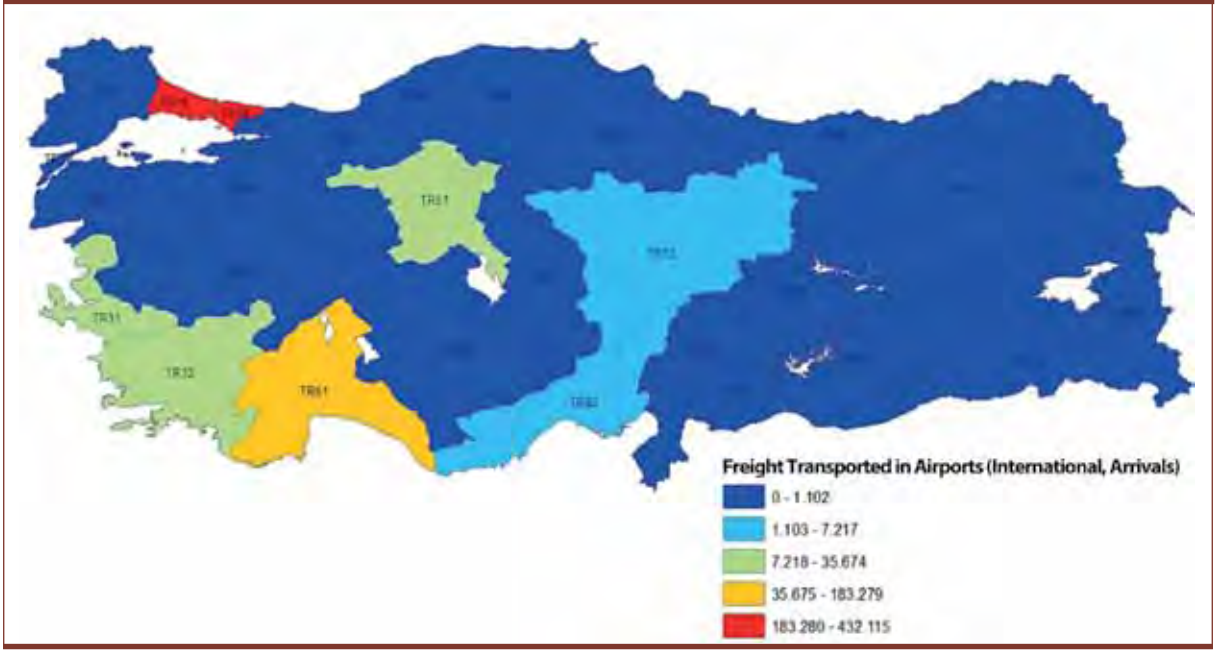
The number of planes taking off and landing on airports of regions reflects the impact of recent investments in aviation and liberalization of the sector. The number of planes in traffic in regions TR61 and TR32 is higher than in other regions with the exception of İstanbul. Air traffic is intensive mainly for the importance of the tourism sector in these regions. TR51 and TR31 are other regions noteworthy in terms of air traffic.

Figure 60: Cargo Transferred at Airports (Domestic Lines, Arriving-2011)



Source: *Authors' Calculations on the basis of TÜİK data.*

Figure 61: Cargo Transferred at Airports (International, Arriving-2011)



Source: *Authors' Calculations on the basis of TÜİK data.*

The most basic reason for preferring is its speed. However, per unit costs are quite higher than other modes of transport. It is preferable for distances longer than 500 km. Nevertheless, the speed provided by this mode can be considered as a factor reducing storage costs.[42]

However, along with globalization, the concepts of time and speed have gained importance for global companies in addition to cost. Consequently, the role of air transportation in integrated transportation scheme is consistently increasing. According to statistics for the last decade this form of transportation has a share of only 2% in total cargo in terms of tons. On the other hand, looking from the angle of dollar value, we see that air transportations has its share of 33% in total cargo. This clearly shows that this form of transportation may be chosen in spite of its high cost.

In Turkey, we see region TR10 coming to the fore with significant increase in air transportation. Being safer and faster, it is gaining further importance in recent years.

42 Baki B., (2004), Lojistik Yönetimi ve Lojistik Sektör Analizi, Volkan, Ankara

10. CONCLUSION and EVALUATION

10. CONCLUSION and EVALUATION

In our present day, the concepts of growth, development and progress tell different things. Development of countries and regions is meaningful to the extent that they are achieved in a manner that ensures sustainability and individual welfare. The understanding of growth based on physical capital accumulation which is the basis of neoclassical economics led to diminishing returns to scale and failed to ensure the sustainability of development. Rising labour productivity, R&D and expanding innovation capacity, on the other hand, make increasing returns possible instead of diminishing returns to scale.

The theoretical basis of middle-income trap is the following assumption of neoclassical economics: Given technology and labour input, increase in capital would raise the level of production but only at gradually decreasing rates. However, as endogenous growth theories reveal, increase in labour productivity and modelling of technology as an inner factor would make increasing returns possible.

There are many empirical studies on middle income trap. To analyze the concept of middle income trap, Felipe et. al. first discuss at which income thresholds this "trap" may emerge, and then how many years of delay in getting out of it can be considered as a problem.

Countries with per capita income under 2,000$ according to 1990 Purchasing Power Parity (PPP) are considered as low income countries; per capita income in the range 2,000-7,250% as middle-low; 7,250-11,750 as middle-high and finally others with per capita income above 11,750$ as high-income countries.

According to this grouping, out of 124 countries examined 82 (66%) belong to the low income group, 33 (26.5%) to middle-low and 6 (5%) to middle-high income group while only three oil-rich countries (Kuwait, Qatar and United Arab Emirates) could find their places in high-income group.

The period of remaining in middle-low income level which was 17 years in the People's Republic of China is longer than 50 years for Bulgaria and Turkey. Turkey reached middle-low income level in 1955 and it took 50 years to attain middle-high income level in 2005. Turkey is one of the three countries (others are Bulgaria and Costa Rica) where the status of middle-income country lasted longest in relative terms.

One way of measuring development is to observe the trend of Total Factor Productivity (TFP) over years. The trend of Total Factor Productivity (TFP) in Turkey was positive in the period 1980-89. In the period 1990-1999, TFP exhibited a highly fluctuating trend and it tended to fall in the period after 2000. Taking 1980-2010 as a longer term we see a similar trend in TFP index as well. If we take the level in 1980 as 100, accumulated increase in TFP until 1990 was by 20%. 1990s witnessed ever increasing. Achievements in the early 2000s were lost after 2005 and the TFP stock of Turkey left 2010 behind by only 5 index points above the level in 1990.

The contribution of TFP to growth was, in general terms, at a significant level for a relatively short time period in the interval 1980-89. This period during which economy was in the process of restructuring and trade and factor markets were consolidated was followed by an environment of fluctuations and uncertainties of the 90s under uncontrolled financial liberalization. The post-2005 growth pattern of Turkey was driven to excessively capital-intensive technologies as a result of large foreign trade deficit and possibilities of cheap importing.

The export pattern of Turkey which, in the 70s, consisted mainly of agricultural products, then moving to traditional labour-intensive sectors in the 80s and shifting to sectors with "middle-low" and "middle-high" technology in the 90s also reflects transformations that productive sectors of the economy underwent. In this respect, examining how the Turkish economy is integrated with world production networks and

determining its "relative" position will be illuminating in efforts to respond the question of "product trap" associated with middle-income trap. For example, in case products on which there is specialization in foreign trade are of low productivity/low value added, this situation may cause the economy to stagnate or fall behind.

Total exports of Turkey which amounted to 23.2 billion $ at current dollar rate in the year 1996 increased in this period by annual average of 16.1% and reached 132 billion $ in 2008, to recede back to 102.1 billion % in 2009. As of the end of 2011, total exports of Turkey amounted to 134.9 billion $. Turkey's imports, on the other hand, totalling to 43.6 billion $ in 1996 increased by 15.3% a year and rose to 202 billion $ in 2008, then drastically falling to 141 billion $ in 2009.

The Turkish economy has its foreign trade component that basically imports intermediary and capital (investment) goods and exports intermediate and consumption goods. In the period 1996-2011, shares of capital, intermediate and consumption goods in total exports are, respectively, 9.5%, 44.3% and 45.8%. The striking point here is that the share of consumption goods in total exports has been steadily falling since 1996: while the share of consumption goods in total exports of the country was 53% in 1996, it fell to 38.7% as of 2011. The shrinking share of consumption goods in total exports is particularly salient after 2004.

Low technology sectors in the Turkish economy consistently make positive contributions to the trade balance since 1998. Here, the traditional sectors that strike attention include Tobacco, Textiles, Garment and Furniture. Besides declining trade contribution of these sectors that used to be a positive factor for the Turkish economy for a long time, there is also no change in their production structures. It is also important that in textiles and garment sector, for example, Turkish firms consistently import intermediate goods while exporting final consumption goods. It appears that in this specific sector which it traditionally specializes, Turkey is losing its comparative advantage in intermediate, semi-finished and final consumption goods in the face of increasing competition.

Among middle-low technology sectors, the Basic Metal Industry displayed change in structural terms. While in 1998 and 2002 this sector had negative contribution to trade balance in terms of the group of intermediate goods and semi-finished products, it contributed positively at a significant level in 2009. Plastic and Rubber and Mineral Products have been sectors which traditionally have their positive contribution to trade balance at various stages of production. However, the decline in time of this positive contribution may be interpreted as Turkey's gradually weakening comparative advantage in these sectors in the face of intensive competition.

Electrical Machinery and Devices and Motor Vehicles are those middle technology sectors which, in the global market, Turkey has its comparative advantage at various stages of production. Though partly, Machinery and Equipment (29) can be added to this group for its positive contribution in semi-finished goods.

The only sector in middle-high technology group that contributes positively to trade balance is Motor Vehicles (34). It is also the only sector that displayed significant change in the period 1998-2009. Indeed, while this sector had its negative contribution to trade balance at all stages of production in 1998, afterwards it started to contribute positively at increasing rates for the final stages of production.

In the 2000s, Radio, Television and Communication Equipment and Devices which have its special place together with the sector of Motor Vehicles in terms of both output and productivity and increase in exports, accounted for 3.2% of total exports and 4.1% of total imports. Except for the final stage of production, Radio, Television and Communication Equipment and Devices contribute negatively to the foreign trade balance of these sectors.

Drawing a line on a map of Turkey extending from Zonguldak to Hatay, 601 billion $ of national product amounting to 772.3 billion $ (78%) is accounted for by 12 regions to the west of this line covering 30 provinces. The remaining part of 171.3 billion $ is by 14 eastern regions covering 51 provinces. In 2011, four regions, namely TR10 İstanbul and TR51 Ankara, TR41 Bursa, Eskişehir, Bilecik and TR42 Kocaeli, Sakarya, Bolu, Düzce, Yalova together stand for **376 billion US$** part of total national product.

In clearer terms, the economic size of these 4 regions totalling to **376 billion $** is**:**

- about the total for Finland (194 billion $) and Hungary (196 billion $),
- larger than the total for Iraq (139 billion $) and Israel (237 billion $) and
- larger than that of Greece (294 billion $), Norway (266 billion $), Romania (267 billion $), Singapore (315 billion $) and Switzerland (354 billion $).

As another agglomeration area, the triangle TR31 İzmir, TR33 Manisa, Kütahya, Afyon, Uşak and TR33 Denizli, Aydın, Muğla, contributed **115 billion $** to national product in 2011. The third agglomeration with contribution exceeding 50 billion $' is TR61 Antalya, Isparta, Burdur, TR51 Konya, Karaman and TR62 Adana, Mersin with **79 billion $**.

There are 6 Level-2 regions in Turkey immune from the middle-income trap risk. These are TR10 (İstanbul), TR42 (Kocaeli, Sakarya, Bolu, Düzce, Yalova), TR41 (Bursa, Eskişehir, Bilecik), TR51 (Ankara), TR21 (Tekirdağ, Edirne, Kırklareli) and TR31 (İzmir). While 12 regions face middle-income trap risk, 8 Level-2 regions are in the middle-low income group.

The regions where the ratio of the share of agricultural GVA to population is the highest include TR22 (Balıkesir, Çanakkale), TR33 (Manisa, Afyon, Kütahya, Uşak), TR61 (Antalya, Isparta, Burdur), TR82 (Kastamonu, Çankırı, Sinop) and TR52 (Konya, Karaman). It is interesting that all these regions are in the west and all, with the exception of TR52 (Kastamonu, Çankırı, Sinop) enjoyed productivity-driven increases in the period 2004-2008. This fact seems to confirm the observation in the relevant literature that "in industrialized and economically developed regions, the level of agricultural output and productivity too is higher than in backward regions."

The regions where industrial produce per population is high are as follows: TR41 Bursa, Eskişehir, Bilecik, TR42 Kocaeli, Sakarya, Yalova, Bolu, Düzce and TR21 Tekirdağ, Kırklareli, Edirne. In addition to their internal development dynamics, this position of regions mentioned also derive from their geographical proximity to TR10 İstanbul region, which contributes 213 billion $ to national economy as of the end of 2011 and which has a foreign trade volume of 181 billion $.

In respect to services sector, the region contributing most to local welfare is TR10 İstanbul region. İstanbul is followed by TR51 Ankara where the number of public employees is relatively high and TR31 İzmir. Hence the table is as follows: TR10 İstanbul as the "national economic centre" of Turkey with an economy of 772.3 billion$; TR51 Ankara as "public centre" producing policies and wisdom with its public sector institutions, strong university-research centres, advanced technological infrastructure and qualified human resources and finally TR31 İzmir as a trade centre preserving its historical position with its foundations for foreign trade and industry.

Among level-2 regions in Turkey, one with the highest level of technology is TR51 (Ankara), followed by regions TR10 (İstanbul) and TR42 (Kocaeli, Sakarya, Düzce, Bolu, Yalova). Other regions with index value higher than 2.5 are TR31 (İzmir), TR41 (Bursa, Eskişehir, Bilecik) and TR81 (Zonguldak, Karabük, Bartın). The country average increased from 2.26 to 2.43 from 2003 to 2008. The lowest ranking regions are TRA2 (Ağrı, Kars, Iğdır, Ardahan) and TRB2 (Van, Muş, Bitlis, Hakkari).

According to the number of enterprises and local units, regions with advanced levels of technology are R51 Ankara, TR10 İstanbul, TR41 Bursa, Eskişehir, Bilecik, TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova, TR31 İzmir, TR81 Zonguldak, Karabük, Bartın, TR72 Kayseri, Sivas, Yozgat and TR21 Tekirdağ, Edirne, Kırklareli. In terms of the number of working people, TR51 Ankara region is at the top of the list. Ankara is followed by industrially developed regions of TR41 Kocaeli, Sakarya, Düzce, Bolu, Yalova, TR10 İstanbul and TR41 Bursa, Eskişehir, Bilecik. While remaining below the country average, it is interesting to note that TR72 Kayseri, Sivas, Yozgat region has its higher status.

In terms of salary and wage payments, regions at highest levels of technology are TR51 Ankara, TR10 İstanbul, TR41 Bursa, Eskişehir, Bilecik, TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova, TR31 İzmir, TR51 Ankara, TR10 İstanbul, TR41 Bursa, Eskişehir, Bilecik, TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova, TR31 İzmir, TR81 Zonguldak, Karabük, Bartın and TR72 Kayseri, Sivas, Yozgat. The reason for the region TR81 to appear here is that the region is small in size and the majority of few enterprises existing in the region are in heavy industry. It is interesting to note that TR72 Kayseri region is at higher ranks of the list.

With respect to total annual turnover of enterprises, regions with high technology are TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova, TR51 Ankara, TR10 İstanbul and TR41 Bursa, Eskişehir, Bilecik. The regions at the bottom of the list are the same with those having the least number of enterprises. Another common characteristic of these regions is that they are all giving migration out.

With its index value of 3.702, the TR33 Manisa, Afyon, Kütahya, Uşak region as an exporter stand as the closest one to middle-high technology level in terms of exportation. This fact can be explained by the existence of many high technology enterprises in the region. This region is followed by TR41 Bursa, Eskişehir, Bilecik region where automotive industry has its weight (index value= 3.486), TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova region coming to the fore with its strong infrastructure in automotive, chemicals, textiles etc (index value= 3.465) and TR51 Ankara region with its high technology enterprises and technology development centres (index value= 3.282).

The export region which comes closest to middle-high technology level with the index value of 3.702 is the TR33 Manisa, Afyon, Kütahya, Uşak region. The role of high-technology enterprises established in the region is the leading factor giving this outcome. This region is followed by TR41 Bursa, Eskişehir, Bilecik region where automotive industry has its weight (index value: 3.486), TR42 Kocaeli, Sakarya, Düzce, Bolu, Yalova region with its strong industrial infrastructure in automotive, chemicals, textiles, etc (index value: 3.465) and TR51 Ankara with large-scale advanced technology enterprises and technology development zones (index value: 3.282).

In the period 2008-2010, the population of İstanbul grew steadily ant at increasing rates while there was population decrease in the Level-2 region TRA2 (Ağrı, Kars, Iğdır and Ardahan). In this period of three years there are two Level-2 regions losing population. The first one is Level -2 TRA2 and the other is Level-2 TRA1 region (Erzurum, Erzincan, Bayburt). In other Level-2 regions in Eastern and South-eastern Anatolia population growth continues as a result of high rates of fertility. Thus, turning back to regions TRA2 and TRA1, we can say that these regions lose population because of intensive migration out although rates of fertility are also high in these two regions.

İstanbul is at the top of the list in terms of both total and per capita value added. It also leads the list with its rate of urbanization of 99 percent. The level-2 region with the lowest per capita gross value added (GVA) is TRB2 (Van, Muş, Bitlis, Hakkari). İstanbul produces more than four times the GVA produced by the region TRB2. The two regions with lowest rates of urbanization, TRA2 (Ağrı, Kars, Iğdır, Ardahan) and TRB2 (Van, Muş, Bitlis, Hakkari) are also at the bottom of the list in terms of per capita income. While per capita income in both of these regions is around 3,500$, the rate of urbanization is below 50%.

In terms of the share of people with postgraduate degrees in total population over age 30 Ankara, Erzurum, Isparta, Eskişehir and Elazığ are the first five provinces. In Turkey, of population at age 30 and above there are 20.4 persons with postgraduate degree out of 10,000 people. The figure is 48.7 for Ankara, 39.8 for Erzurum and 35.9 for Isparta. At the bottom of the ranking we see Mardin, Hakkâri, Bayburt, Osmaniye and Amasya. In these provinces, the number of persons with postgraduate degree per 10,000 varies between 5.8 and 7. Examining the country as a whole in this regard, we find that in 25 provinces the number of persons with postgraduate degree is fewer 10 in 10,000 people.

In terms of the share of college or university graduates in total age 22+ population, Ankara, Eskişehir, İzmir, İstanbul and Antalya share the top five. In Ankara, of 100 persons at age 22 and over 17.4 are college or university graduates. In Eskişehir and İzmir it is 13 out of 100. Taking the country as a whole, 10 out of 100 have their higher education diplomas. The provinces having the fewest number of university graduates are Ağrı, Şanlıurfa, Muş, Van and Mardin. In these provinces, only 5 out of 100 have this educational status.

Examining average years of schooling per person on the basis of provinces according to 2011 data, the top three are Ankara (8.55 years), Eskişehir (8.13 years) and İzmir (7.9 years). Average years of schooling in 28 provinces is higher than the country average while 53 provinces remain below this average. Ağrı, Şanlıurfa and Muş are three provinces where average years of schooling is the lowest. In Ağrı and Şanlıurfa it is shorter than 5 years.

EVALUATION

On the basis of all these analyses it can be concluded that there is no middle-income trap risk for Turkey. But this conclusion will invite the question "which Turkey?" This conclusion, however, may invite the question "Which Turkey?" Responding to this question, it can be said that there are three different "Turkeys": there is no middle-income trap risk for the first one that is developed and industrialized; such a risk does exist for the second Turkey and, finally, there is the third Turkey for which one can speak not only of middle-income but also poverty risk. Since the "first Turkey" accounts for a very large share of both national product and population and also rooms in administrative, political, economic, commercial, industrial and media-related power centres, delays may be expected in this "Turkey's" awareness about the problems of other regions and in developing pertinent solutions.

In the light of these, what kind of regional development policy should be pursued in the coming period? In Turkey, while regional development policies were marked at local level by such problems as insufficient institutional capacity and shortage of qualified labour force until the 2000s, a significant headway has been made afterwards thanks to the implementation of EU regional policies, establishment of development agencies and employment of personnel endowed with high technical capacity in regions. Still, the absence of differentiation in regional development policies impedes the development of regions.

Thus, it is inevitable to develop different policy designs for regions at different levels of income and development:

- Focusing on technology-intensive areas and preferring supply-sided policies of incentive in regions immune from the middle-income trap risk,
- Developing transportation infrastructure and supporting middle-low and middle-high technology based production in regions with middle-income trap risk,
- For other regions, adopting measures geared to solving the problem of scale in agriculture, ensuring transition from subsistence economy to industrial production and designing demand-side incentives for goods produced in these regions.

Such regional institutions as development agencies need to be structured in compliance with production characteristics of respective regions. Hence, the composition of development agencies may vary with respect to regions. For example, while there may be a financial development agency in İstanbul responding to the needs of this particular sector, the development agency in regions such as Bursa and Kocaeli may be tailored to the automotive sector in particular and that in Ankara may focus on the sector of informatics.

There is need to introduce radical changes also to the process of preparing regional plans as fundamental policy documents of regional development. Central organizations and agencies should design strategies at regional level to set their regional vision, objectives and targets, and development agencies should come up with *"medium-term regional programmes"* with the logic of "Medium-Term Programme" (MTP) on the basis of these strategies. This will make it possible to see to what extent each region will contribute to national development, and to publicly follow spatial policy designs by public agencies and outcomes of implementation. Development agencies, on their part, will ensure inter-agency coordination and steer implementation by giving technical support to public agencies and through monitoring, evaluation and impact analysis they will carry out in the context of regional MTPs.

In his widely known work "State-Building", Francis Fukuyama says, *"what lies behind many of today's important problems from poverty to AIDS and from drug addiction to terrorism is weak of failing states"* while discussing the role of State in development. This is an inference that should be considered in the context of regional development as well. The global crisis demonstrated to all developed and developing countries that purely liberal economic systems that exclude public intervention leaving aside some regulating role are also vulnerable to crises. So let's close by quoting from Francis Fukuyama "I *start analyzing the role of the State in development by asking this question: Does the US have a strong or weak state?"*

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ANNEXES

Vertical Classification by Production Processes

3'lü Sınıflandırma	BM - GEGS Kodu	5'li Sınıflandırma
Temel Mallar	111*	Temel Mallar
	21*	
	31*	
Ara Mallar	121*	Ara Mallar-Yarı Mamul
	22*	
	321*	
	322*	
	42*	Ara Mallar-Parça ve Bileşenler
	53*	
Nihai Mallar	41*	Nihai Mallar-Sermaye
	521*	
	112*	Nihai Mallar-Tüketim
	122*	
	51*	
	522*	
	61*	
	62*	
	63*	

Source: Lemoine and Ünal-Kesenci (2004)

Contribution to Trade Balance:

One of the different "comparative advantage in foreign trade" indicators used in the study is contribution to trade balance (CTB). This foreign trade indicator that basically takes into account both export and import balances was developed by the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII):

The indicator assumes the following value for the economy *c* and the sector *s* in the period *t:*

$$CTB^{C}_{s,t} = \left(\frac{x^{c}_{s,t} - m^{c}_{s,t}}{(x^{c}_{t} + m^{c}_{t})} - \frac{x^{c}_{t} - m^{c}_{t}}{(x^{c}_{t} + m^{c}_{t})} \times \frac{x^{c}_{s,t} + m^{c}_{s,t}}{(x^{c}_{t} + m^{c}_{t})} \right) \times 100$$

c : country
s : sector
t : period

The first term in the equation gives the trade balance as weighed by total volume of trade. Given that the concept "advantage in foreign trade" is also dependent to the structural characteristics of the economy in question, the second term in the expression can be thought as a contribution that clarifies "short-term business cycles effect". Based on the assumption that the contribution of each sector to trade balance would be the same with the weight of that sector in foreign trade, this term, in a sense, calculates the "expected" contribution of the sector concerned (with due account of macroeconomic changes). The difference between these two terms is the difference between the "real" contribution of the sector to trade balance for the economy *c* and sector *s* in the period *t* and its "expected" contribution. This makes it possible to determine the "specific" contribution of each sector to trade balance.

Competitiveness in Foreign Trade:

In order to compare comparative foreign trade advantages of different economies in different production processes, the study employs revealed comparative advantage (RCA) indicators since it makes it possible countries over a period of time.

Accordingly, given that $X^{c}_{s,t}$ denotes sector *s* exports of economy *c* at time *t*; $X^{c}_{-s,t}$ total exports of economy *c* at time *t* with the exception of sector *s* and finally $X^{-c}_{-s,t}$ denotes total world exports - ($X^{c}_{-s,t}$+$X^{-c}_{s,t}$), we have:

$$RXA^{c}_{s,t} = (X^{c}_{s,t})/(X^{c}_{-s,t}) \Big/ (X^{-c}_{s,t})/(X^{-c}_{-s,t})$$

$$RMA^{c}_{s,t} = (M^{c}_{s,t})/(M^{c}_{-s,t}) \Big/ (M^{-c}_{s,t})/(M^{-c}_{-s,t})$$

$$RCA^{c}_{s,t} = \ln(RXA^{c}_{s,t}) - \ln(RMA^{c}_{s,t})$$

For making the indicator comparable for countries over time, Lederman, Olarreaga and Rubiano (2008) suggested the following modification:

$$\widetilde{RCA}^{c}_{s,t} = RCA^{c}_{s,t} - \sum_{s} RCA^{c}_{s,t} / n$$

The indicator of revealed comparative advantage used in this study is the Lederman, Olarreaga and Rubiano – *RCA* indicator.

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