# SELECTED DISCUSSIONS ON SOCIAL SCIENCE RESEARCH



EDITORS

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# PREFACE

Change is one of the most difficult phenomena to accept for the people as we humans, are generally inclined to stay in our comfort zone and daily routine. However, we are living in an ever-changing world and one of the main objectives of social scientists is to find the ways as to how to respond to these changes for a better future for the humankind. This is why social scientists should always be in touch with society and aware of the main topics for a thorough analysis of social transformations and dynamics. Besides, social issues have complex situations, and therefore, require a multidimensional perspective and the involvement of different disciplines to develop sound solutions. This book has been written keeping this reality in mind.

A glimpse into the social science's difficulties vis-a-vis the ones of natural science indicates that social science is more challenging as the data is more unmanageable. Besides, human problems do not usually have right or wrong answers and therefore do not offer simple scientific laws. Thus, instead of searching for unquestionable social laws, social scientists bring in new concepts that frame public debates and stimulate critical thinking. In this vein, when Einstein was once asked, "Why is it that when the mind of man has stretched so far as to discover the structure of the atom, we have been unable to devise the political means to keep the atom from destroying us?", he answered, "That is simple, my friend, it is because politics is more difficult than physics." Hence, the primary aim of this book is to keep the readers and social sciences scholars up-to-date on the main discussion topics in social sciences.

In this backdrop, the current book entitled "Selected Discussions on Social Science Research" is designed as a guide for readers to help them in understanding important topics in social sciences, and comprised of seven chapters as Archaeology; Management, Human Resources, Sociology, Economy, Educational Sciences, Law, Public Administration, Political Science, International Relations, and Public Finance. Accordingly, a total

of sixty-five scholars from different disciplines of social sciences contributed to the book.

A better world can only be reached by discussing on better conditions. For this reason, we hope that this book, which has been prepared with the aim to improve the dialogue between all areas of social sciences and also between multiple other disciplines, will be helpful for all the readers interested.

We would like to express our gratitude to all of our authors, to the Frontpage Publications Limited and to everyone who has contributed to the idea and realisation of this project.

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**İzmir, TURKEY**
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# Sectoral Dimensions in the Fight against Inflation: Analysis and Recommendations

**Yaşar UYSAL & Nilgün ACAR BALAYLAR**

**ABSTRACT**

Turkey is the leading country in the world with long sustained periods of high inflation. Therefore, it is possible to state that high inflation has become a structural phenomenon. However, at this point, the existing high inflation and its negative repercussions, together with the conditions of reverse globalization process and intensified competition brought about by trade wars, it will be more challenging for Turkey to keep its (economic) development on track. Hence, for Turkey in particular, the need for a detailed discussion of the sources of inflation and developing new-different strategies in the fight against inflation is evident.

On the basis of such a need, this study aims to put forward sectoral sources of inflation in Turkey and to develop solutions in the fight against inflation accordingly. For this purpose, through various indicators, such as sectoral deflators, Domestic-PPI, Agriculture-PPI, and CPI, the sectors with more and less impact on inflation will firstly be identified. Subsequently, at the sectoral level, the reasons for inflation differentials will be presented. In this context, factors such as supply chain length, dependence on external inputs, exchange rates, market structures, tax policies will be evaluated. Finally, within the framework of the results of the analysis recommendations at macro and sectoral levels will be discussed.

**Keywords:** Inflation, Sectorial Dynamics, and Economy of Turkey.

## INTRODUCTION

The primary objective of economic policy makers has become to ensure price stability considering the destructive consequences in the economy due to the lack thereof. To curb inflation, first and foremost, its sources need to be identified. However, inflation can be caused by many factors

and these sources can trigger each other. In such cases, comprehensive and complicated economic policies should be implemented in the fight against inflation.

The main causes of inflation are related to the demand and cost dimensions. While both factors lead to price increases, they affect the general level of prices through different mechanisms. Demand-pull inflation occurs when aggregate demand cannot be met by aggregate supply. There could be different reasons why producers cannot meet the increased demand. These may be due to insufficient time for production, inadequate production scale, shortages in raw materials deficiency of financing or insufficiently skilled labour.

On the other hand, the factors that lead to an increase in aggregate demand can be listed as follows:

- An economy that grows above its potential leads to an increase in spending through improvement in employment and wages.
- The fact that economic decision makers have negative expectations about the economy and thus the expectation on the increase in general level of prices will further accelerate the price increases. These expectations will lead decisions on purchase of goods and services to be brought forward. The process of moving away from money, which is expected to lose its value, increases inflation even more. For this reason, inflationary expectations should be managed well by the authorities. Central banks need to be credible in order to guide expectations on inflation. Such credibility is achieved by setting a quantitative inflation target in line with the realities of the economy and implementing policies to reach this target. As targets are achieved, (public) confidence in the central bank and its monetary policies will increase. Thus, the inflation figures targeted by the central banks will act as the most important anchor in establishing the expectations of economic agents.
- Expansionary fiscal policies lead to price increases by shifting the equilibrium point of aggregate supply and aggregate demand as these policies will have an impact on economic agents to increase their expenditures
- Expansionary monetary policy leads to an increase in aggregate demand. Monetary expansion also contributes to accelerating inflation through the rise in prices of imported goods due to the depreciation of national currency under the flexible exchange rate regime.
- Financial innovations cause the diversity of borrowing instruments and

the supply of loanable funds to increase. Financial instruments diversified through financial innovations further improves inclusion of economic agents with surplus funds that avoid risk in the financial system. The innovations, which increase the supply of funds, also lead to a reduction in borrowing costs and thus, access to funds becomes easier and less costly. For instance, with the increased use of derivative products such as collateralized debt obligations, which is a financial innovation accepted as a risk management tool, long-term loans increase as well. These developments contribute to demand inflation via increasing aggregate demand.

- The factors led by financial innovations such as, derivative products, increasing number of financial instruments and institutions as well as securitization result in the reduction of financial sector's dependence on the central bank. In this case, the effectiveness of monetary policy practices of the central banks weakens where capital accounts are fully liberalized (Acar Balaylar & Duygulu Abuk, 2016: 398). Financial innovations increase the amount of loanable funds, leading to an increase in aggregate demand, as well as an increase in asset prices. Aggregate demand is also positively affected by the wealth effect created by the increase in asset prices.
- The other type of inflation, called cost-push inflation, arises when there is sufficient demand for producers to reflect cost increases on prices as well as under the conditions of inadequate supply. The factors causing cost-push inflation can be listed as:
- As wages increase above the productivity of workers, this results in wage inflation by increasing producers' cost of labour input. It usually occurs in economies where trade unions are quite strong.
- Cost inflation emerges once we move away from competition in factor markets that supply inputs necessary for production. The existence of one or more larger firms with market power on production or supply could increase costs of input depending on the pricing behaviour of these firms. For example, oil is a non-substitutable input for many products. The decision of the “Organization of Petroleum Exporting Countries” (OPEC) to reduce the amount of oil exported in 1973 caused a cost inflation worldwide.
- Tariffs and taxes imposed by governments on foreign trade may increase input prices. For example, as a result of the US quotas and customs duties introduced on imports of steel and aluminium in 2018, supply bottlenecks and price increases have arisen in some sub-sectors of the manufacturing industry using steel and aluminium as input. In

2008, in the United States, the production of corn was subsidised to further encourage the production of ethanol, a type of fuel derived from corn starch. Since a significant portion of the production was used for ethanol, this led to shortages in corn as a staple food, and thus, food prices increased in the world.

- The increase in production costs via an increase of taxes by the government is another example of cost-driven inflation.
- The depreciation of the national currency against foreign currencies increases the cost of production, especially in sectors with intensive use of imported inputs. If these sectors are export-oriented, the increase in production costs can be offset by an increase in export revenues. Such a development shall take place if the elasticity of foreign demand for the exported goods is greater than the unity.
- High interest rates through the channel of financing costs may also be one of the reasons for cost inflation. The cost of credit may become an important production cost, especially if the companies operating in the country have insufficient self-financing opportunities. In the case of strong demand, the general level of prices increases when the increasing production cost resulting from high interest rates is reflected in the prices of goods and services.

As can be seen, inflation is caused by many factors. In this study, following the analysis on the course of inflation in the world and Turkey, sectoral sources of inflation, which has become a structural problem in Turkey, will be identified and policy proposals will be discussed in this manner.

# INFLATION IN THE WORLD AND TURKEY

In the last two decades, there has been a widespread belief that activist monetary policies implemented to increase production and reduce unemployment have led to high inflation; while at the same time there has been no lasting results in production growth and low unemployment. As a result of this belief, it has become commonplace that price stability should be the primary objective of monetary policy all over the world. The reasons for these developments can be listed as ; a) that the effects of monetary policy practices on production growth and unemployment reduction targets emerge with a certain time delay, and that policy makers encounter uncertainties about timing and quantity adjustments in monetary policy practices, b) The disappearance of the relationship between inflation

and unemployment introduced by the Phillips curve in the long-run and that the expansionary policies only increase inflation in the long run and have no effect on the real economy, c) due to the time inconsistency of monetary policy, prediction of policy makers' expansionary policies by firms and workers and setting of expectations on wages and prices in accordance with this prediction which in turn results an increase in prices and wages instead of production (Mishkin, 1997: 11-12).

Besides the reasons mentioned above, it is argued that price stability has become the primary target of monetary policy, as the financial sector has become more influential on economic policies and this sector has played a role in turning objectives related to unemployment, income distribution and development into secondary targets. In an inflationary economy, there is a possible danger that returns on financial assets could erode. This danger is even more prominent, especially for those investing in fixed interest financial assets. Therefore, financial business communities are domineering about keeping inflation low. They play a very active role in the implementation of contractionary policies and raising interest rates on the grounds that decreasing unemployment rates and growth-enhancing policies will increase inflation (Eroğlu, 2007: 8).

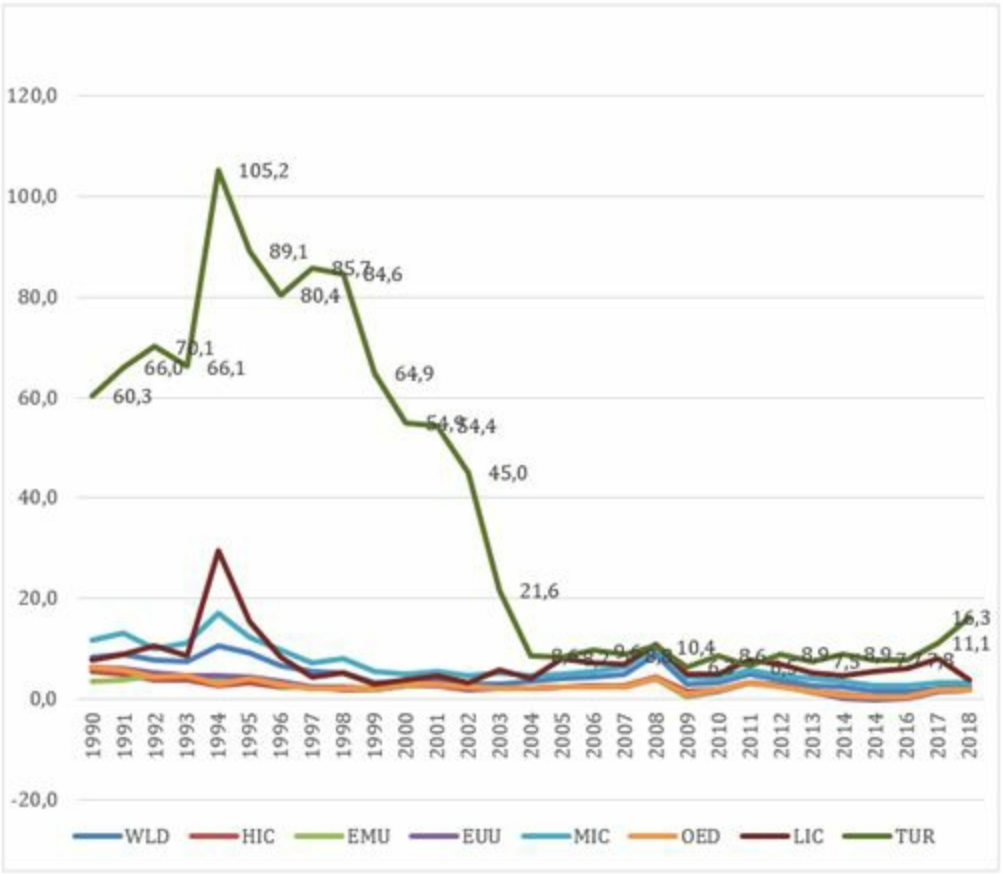
The biggest threat to the financial sector is unforeseen inflation and market instability. For this reason, the primary priority for the financial sector is that the central bank, as the monetary policy executive should control inflation and ensure stability in the financial sector. Therefore, while workers, producers and farmers support expansionary monetary policies; financial firms support contractionary monetary policies (Goodman, 1991: 329–333).

Until 1930, the sole purpose of monetary policy was to maintain price stability. After the First World War in 1921-1923 and immediately after in 1929-1933 during the great depression, production and employment were the major concerns for policy makers and almost all countries implemented expansionary policies by lowering interest rates to increase production and reduce unemployment (Arntd, 2011: 121-122). Similarly, in the 2008 global crisis, many countries opted to implement expansionary policies by lowering interest rates in order to stimulate contracting economies.

In summary, since the 1970s, price stability has become a priority for economic policy makers and policies have been very successful in this regard. Graph 2.1 presents consumer inflation rates by selected country groups. Inflation is no longer a problem for both developed and developing

country groups. While there was an inflationary trend in the 1990s throughout the world and also in the middle and low-income countries, it is seen that a lot has been achieved in the fight against inflation towards the end of this period. Especially in this period, based on the New Zealand case, many countries started to implement inflation targeting strategy for price stability and achieved significant results.

**Graph 2.1: Inflation in the Selected Group of Countries and Turkey (CPI%)**




*WLD= World, HIC= High Income Countries, EMU= Euro Area, EUU= European Union, MIC= Middle Income Countries, OED= OECD Countries, LIC= Low Income Countries, TUR= Turkey*

**Source: World Bank, World Development Indicators.**

It is seen that with the 2008 global crisis, consumer inflation increased in all country groups, but then re-entered a downward trend. Especially the 1990s have been a period of high inflation rates for Turkey. The policy changes to combat inflation in the post-2000 period resulted in a significant drop in inflation rates. However, in recent years, inflation has risen above 10 percent. In the light of the data presented in Table 2.1, we can conclude that problem of high inflation worldwide has been overcome, but that the same is not true for Turkey. The following table shows the countries with the highest inflation in the ranking according to the inflation

rate as of 2019.

**Table 2.1: Country Ranking by Inflation Rate**

| Rank | Country | Inflation rate (CPI) | Date |
|---|---|---|---|
| 1 | Venezuela | 282972.80 | April 19 |
| 2 | Zimbabwe | 288.50 | August 19 |
| 3 | North Korea | 55,00 | June 19 |
| 4 | Argentina | 53.60 | August 19 |
| 5 | Sudan | 53.10 | August 19 |
| 6 | South Sudan | 51.90 | June 19 |
| 7 | Iran | 41.60 | August 19 |
| 8 | Liberia | 23.30 | April 19 |
| 9 | Haiti | 19.10 | June 19 |
| 10 | Ethiopia | 17.90 | August 19 |
| 11 | Angola | 17.50 | August 19 |
| 12 | Sierra Leone | 17.46 | March 19 |
| 13 | Turkey | 15.01 | August 19 |

**Source: Trading Economics, https://tradingeconomics.com/ country-list/inflation-rate**

Over many years, inflation in Turkey remained at such high levels that adversely affected macroeconomic variables. In line with the inflation-targeting regime implemented in the 2000s, the inflation rate could be reduced below 10 percent, although the targets were not met. As mentioned above, there are still few countries in the world that have to combat inflation. Despite the implementation of the strategies related to monetary policy to ensure price stability in Turkey, previous achievements through inflation targeting have started to erode recently. The failure in price stability suggests that the source of the problem could have been misidentified and thus the wrong strategies have been pursued.

The factors contributing to the decline in inflation before the global crisis (2000-2008);

* Preventing the monetization of public deficits through the amendment of the CBRT law,
* The rise in foreign capital inflows due to the abundance of global liquidity and the decrease in production costs in sectors using imported inputs through overvaluation of TL,
* Overvalued TL leading to an increase in demand for imported goods and thereby adjusting the disequilibrium state of aggregate supply and demand,
* Entrepreneurs' decisions to reduce labour costs in order to increase falling profits as export-oriented sectors become less competitive due

to overvalued TL as well as productivity increases arising from the renewal of machinery equipment as entrepreneurs adopt capital intensive techniques due to cheap foreign currency.

* Cheap imports from countries such as China and India,
* Adoption of a new pricing behaviour which considers the targeted (expected) inflation rate instead of (demand) backward pricing.

However, inflation outlook started to deteriorate after the 2008 Global Crisis. Repercussions of the 2008 global crisis were felt in Turkey's economy with a lag. As developed countries applied expansionary monetary policies in order to exit from the crisis, this led to TL to remain overvalued until 2010. However, the European Debt Crisis that emerged in 2011 and the Fed's announcements to move to the tightening monetary policy in 2013 led to an increase in exchange rates resulting in the ending of overvalued TL period. The upward trend in exchange rates was accompanied by inflation.

On the basis of producer and consumer prices, Graph 2.2 helps us to analyse the inflation in Turkey, which has been somehow far from the desirable levels. Producer prices show us the cost-driven effects on consumer prices. During a period of increases in exchange rates or increases in oil prices, producer prices rise above consumer prices (Ertuğ & Yüksel, 2017, 1). The increase in costs is reflected in consumer prices within a certain period of time. In 8 years of the 14-year period between 2004-2018, the rate of increase in producer prices was much higher than the rate of increase in consumer prices. Such a divergence refers to the weight of cost-driven inflation in Turkey.

Graph 2.2: The Course of CPI and PPI in Turkey




Source: CBRT EVDS

These statements clearly reveal that Turkey has failed in the fight against inflation. Undoubtedly, it can be stated that besides economic factors, this situation results from political, social and cultural factors as well. It is this important factor, called multidimensionality that makes the problem harder to solve. However, in this study, sectoral sources will be dealt with as another important dimension, which is overlooked in the fight against inflation in Turkey.

# THE SECTORAL ANALYSIS OF INFLATION

In this section, drawing on the indicators such as Agricultural Products Producer Price Index (Agriculture-PPI), Domestic Producer Price Index (D-PPI), CPI and sectoral deflators, developments in inflation in Turkey in the 2003-2018 period, in particular, its sectoral dimensions will be analysed.

As a result of these analyses primarily;

√ The main sectors that play a role in the increase of inflation,
√ The sectors that prevent higher inflation,
√ The sectors with the most unstable inflation,

√ The sectors with stable inflation,

will be identified. Then, as far as statistical data allow, the role of the production-consumption chain in the inflationary process will be revealed. The following section of the study will include key macro-factors that are effective on inflation, with reference to sectoral deflators which measure inflation on a wider basis. After revealing the relationship between market structures and inflation, the general and sectoral measures to combat inflation will be discussed.

## *Developments in the Agriculture PPI Dimension*

One of the indicators that can be taken into consideration in the sectoral analysis of inflation is the Agricultural Products Producer Prices Index (Agri-PPI). This index "is calculated in order to monitor the proportional monthly changes of agricultural products produced and sold by farmers at the first point of sale through time" (http://www.tuik.gov.tr/PreHaberBultenleri.do?id=30738, 30.09.2019). The Table 3.1 presents the Agriculture-PPI data calculated for the 2003-2018 period examined in this study.

**Table 3.1: Inflation in Agriculture Sector**

| SUB-SECTORS | 2003-2018 Period increase (Times) | 2003-2018 Period: Average increase (%) |
|---|---|---|
| **Agriculture-PPI** | **2,39** | **6,08** |
| Fishing | 27,36 | 25,73 |
| Forestry products | 3,91 | 10,18 |
| Agriculture and hunting products | 2,23 | 5,60 |

***Source: Calculated by using TURKSTAT data***

Accordingly, the average annual inflation was 6.08 percent in the 2003-2018 period and the prices of agricultural products increased by 2.39 times compared to the beginning of the period. Considering the sub-sectors, it is seen that the average annual inflation is 5.6 percent in agricultural and hunting products, 10.1 percent in forestry products, and 25.7 percent in fishing products. Inflation rates in the agricultural sub-sectors were at quite different levels and as a result, the prices of agricultural and hunting products increased by 2.23 times, forestry products by 3.91 times and fishing products by 27.36 times in 2018 compared to 2003. Therefore, agriculture has seen a very uneven inflationary process in terms of sub-sectors. It is possible to state that the difference in the level of dependence on nature in the production process is effective in the emergence of this

situation in sub-sectors. These data also point to the need that special measures should be taken in the fight against inflation, especially in fisheries.

**Table 3.2: Inflation Variation in Agricultural Sector**

| | Standard Deviation | Average | Coefficient of Variation |
|---|---|---|---|
| **Agriculture-PPI** | **4,62** | **6,08** | **75,96** |
| Forestry products | 12,27 | 10,18 | 120,53 |
| Agriculture and hunting products | 4,66 | 5,60 | 83,28 |
| Fishing | 16,06 | 25,73 | 62,41 |

***Source: Calculated by TURKSTAT data***

Besides the level of inflation its stability/instability is important in the fight against inflation. In this regard, the Table 3.2 presents the coefficients of variation for the period 2003-2018. These coefficients were calculated by dividing the standard deviation of the annual data by the average values for the period in question. According to this, the highest coefficient of variation, in other words the most unstable sub-sector in terms of inflation, is forestry and the lowest is fishing. These data reveal that there is stability in the level of high price increases in fisheries, which have significantly high inflation.

## *Developments in The Domestic PPI*

The Producer Price Index (D-PPI) is defined by TURKSTAT as "measure of the change in the prices of goods and services sold as output by domestic producers in a given reference period. (http://www.tuik.gov.tr/PreHaberBultenleri.do?id=30806.30.09.2019). This index comprises the sub-sectors mining and quarrying, manufacturing industry, electricity and gas and water supply.

**Table 3.3: Inflation in (D-PPI) For Main Groups**

| | 2003-2018 period increase (Times) | 2003-2018 Period: Average Increase (%) | Coefficient of Variation |
|---|---|---|---|
| **Domestic-Producers Price Index** | **3,81** | **9,52** | **70,49** |
| A- Mining | 4,86 | 11,32 | 59,54 |
| B- Manufacturing | 3,83 | 9,61 | 76,92 |
| C- Water supply; sewerage, waste management and remediation | 3,16 | 8,22 | 89,86 |
| D- Electricity, gas, steam and air conditioning | 2,86 | 7,84 | 147,77 |

***Source: TURKSTAT data.***

As can be seen from the table, the annual average D-PPI inflation was 9.5 percent in the 2003-2018 period. The figures were calculated as 11.3 percent for mining and quarrying, 9.6 percent for manufacturing industry,

8.2 percent for water supply and related activities, and 7.8 percent for electricity and gas production distribution. These data point to the existence of high inflation rate in the sub-sectors but a more balanced look when compared to agriculture.

The inflation data for the sub-groups covered in the D-PPI are given in Table 3.4. As can be seen here, the sub-groups with the highest annual average inflation are; coke and refined products and main metals group, and the lowest sub-groups were basic pharmaceutical products and other means of transportation.

**Table 3.4: Inflation in The Sub-Groups Of D-PPI**

| | 2003-2018 period increase (Times) | 2003-2018 Period: Average Increase (%) |
|---|---|---|
| **D-PPI GENERAL** | **3,81** | **9,52** |
| Coke and refined petroleum | 8,17 | 17,41 |
| Basic metal industry | 6,39 | 14,75 |
| Furniture | 3,96 | 9,85 |
| Chemicals and chemical products | 3,88 | 9,87 |
| Textile products | 3,81 | 9,71 |
| Fabricated metal products, except machinery and equipment | 3,8 | 9,65 |
| Food products | 3,71 | 9,25 |
| Paper and paper products | 3,7 | 9,47 |
| Electrical equipment n.e.c. | 3,68 | 9,36 |
| Rubber and plastic products | 3,68 | 9,3 |
| Other non-metallic mineral products | 3,55 | 8,98 |
| Machinery and equipment, n.e.c. | 3,4 | 8,71 |
| Beverages | 3,29 | 8,4 |
| Wood products, except furniture | 3,23 | 8,42 |
| Collection, purification and distribution of water | 3,16 | 8,22 |
| Dressing of leather | 2,89 | 7,45 |
| Electricity and gas | 2,86 | 7,84 |
| Motor vehicles, trailers and half trailers | 2,81 | 7,49 |
| Printing and recording services | 2,61 | 6,8 |
| Tobacco products | 2,41 | 6,41 |
| Wearing apparel | 2,31 | 5,85 |
| Other manufactured goods | 2,28 | 6,24 |
| Computer, electronic and optical products | 1,78 | 4,29 |
| Other transport equipment | 1,7 | 3,93 |
| Basic pharmaceutical products and pharmaceutics preparations | 0,96 | 0,05 |

***Source: TURKSTAT data***

When price increases in the whole period are analysed, it is seen that the highest price increases are in coke and refined products (8.1 times) and basic metals (6.3 times). When all subgroups are evaluated together; it is comprehended that periodical price increases vary between 8.1 times and 0.9 times and there are significant differences between sectoral inflation.

The coefficients of variation according to the sub-groups in the D-PPI are given in Table 3.5. The price instability in basic pharmaceutical products, which has the lowest price increase in the 2003-2018 periods, is

incompatibly high. It is possible to speculate that this is due to the fact that the prices of these products are determined by the government to a significant extent as well as the price increases made at regular intervals mostly depending on the exchange rates.

**Table 3.5: Inflation Variation in PPI Subcategories**

| Sector | Standard Deviation | Average | Coefficient of Variation |
|---|---|---|---|
| Basic pharmaceutical products and pharmaceutical preparations | 7,97 | 0,05 | 17380,6 |
| Other transport equipment | 8,43 | 3,93 | 214,6 |
| Computer, electronic and optical products | 8,89 | 4,29 | 207,47 |
| Other manufactured goods | 11,72 | 6,24 | 187,88 |
| Electricity, gas | 11,59 | 7,84 | 147,77 |
| Tobacco products | 8,99 | 6,41 | 140,19 |
| Coke and refined petroleum products | 23,21 | 17,41 | 133,3 |
| Basic metals | 19,03 | 14,75 | 129,01 |
| Motor vehicles, trailers and semi-trailers | 9,1 | 7,49 | 121,5 |
| Printing and recording services | 6,81 | 6,8 | 100,1 |
| Chemicals and chemical products | 9,85 | 9,87 | 99,77 |
| Wood and products of wood and cork, except furniture | 8,37 | 8,42 | 99,3 |
| Paper and paper products | 9,24 | 9,47 | 97,53 |
| Textiles | 9,43 | 9,71 | 97,19 |
| Fabricated metal products, except machinery and equipment | 8,92 | 9,65 | 92,39 |
| Water; water treatment and supply services | 7,38 | 8,22 | 89,86 |
| Electrical equipment | 8,07 | 9,36 | 86,18 |
| Wearing apparel | 4,96 | 5,85 | 84,76 |
| Machinery and equipment n.e.c. | 6,98 | 8,71 | 80,21 |
| Rubber and plastic products | 7,31 | 9,3 | 78,61 |
| Manufacturing | 7,39 | 9,61 | 76,92 |
| Furniture | 7,44 | 9,85 | 75,54 |
| Other non-metallic mineral products | 6,09 | 8,98 | 67,89 |
| Leather and related products | 4,88 | 7,45 | 65,52 |
| Beverages | 5,47 | 8,4 | 65,11 |
| Mining and quarrying | 6,74 | 11,32 | 59,54 |
| Food products | 4,96 | 9,25 | 53,61 |

***Source: TURKSTAT data***

Among the other subgroups with high coefficients of variability; other means of transport, computers and electronic and optical products, other manufactured goods and electricity and gas production and distribution are noteworthy. These groups include products with high demand and those that the prices are mostly determined in foreign exchanges. Therefore, it can be stated that the instability in prices depends on these two variables.

Another important point in the table is that the coefficient of variation is the lowest for food products in which there is high inflation. This situation is important in terms of showing that the price increases in food products are permanent and regular and hence there are supply-side problems in this group.

## *Developments CPI*

The statement made by TURKSTAT: "Consumer price index (CPI) measures the change in prices of goods and services for household consumption over time. The main purpose of the 2003 based CPI is to calculate the inflation rate by measuring the change in the prices of goods and services subject to consumption in the market. For this purpose, all final monetary expenditures of households, foreign visitors and institutional population are taken into consideration. This concept excludes owner occupied housing expenditures and expenditures from household production and it also includes 418 items in the index." (http://www.tuik.gov.tr/PreHaberBultenleri.do?id=30858. 30.09.2019). The periodic inflation data, which we calculated from the CPI index, are given in Table 3.6. As can be seen, the highest annual CPI inflation is in alcoholic beverages and tobacco (12.9%) and restaurants and hotels (11.8%). Tax increases are behind the high rate of inflation in alcoholic beverages and tobacco group. On the other hand, it is possible to state that wage increases, and demand increase play a role in the restaurants and hotels group where labour-intensive services are produced.

**Table 3.6: Inflation in the Main CPI Groups**

| Code | Group | 2003-2018 Period increase (times) | 2003-2018 Period average Increase (%) |
|---|---|---|---|
| **0** | **CPI** | **3,63** | **9,0** |
| 2 | Alcoholic Beverages and Tobacco | 5,99 | 12,96 |
| 11 | Restaurant and Hotels | 5,31 | 11,8 |
| 12 | Miscellaneous goods and services | 4,53 | 10,67 |
| 1 | Food and Beverages | 4,12 | 9,95 |
| 4 | Housing, water, electricity, gas and other fuels | 3,99 | 9,72 |
| 7 | Transportation | 3,68 | 9,20 |
| 10 | Education | 3,41 | 8,59 |
| 5 | Furnishings, household equipment, routine maintenance of the house | 3,00 | 7,70 |
| 9 | Entertainment and Culture | 2,49 | 6,33 |
| 3 | Clothing and Shoes | 2,29 | 5,73 |
| 6 | Health | 2,15 | 5,32 |
| 8 | Communication | 1,40 | 2,30 |

*Source: TURKSTAT data*

On the other hand, the lowest price increases in the 2003-2018 period are in the communication group. It is possible to speculate that this is caused by intense competition in the sector.

Table 3.7: Inflation Variation in the Main CPI Groups

| | Standard Deviation | Average | Coefficient of Variation |
|---|---|---|---|
| Health | 5,77 | 6,04 | 95,66 |
| Communication | 1,81 | 2,49 | 72,52 |
| Alcoholic Beverages and Tobacco | 10,15 | 14,36 | 70,67 |
| Transportation | 6,46 | 9,78 | 66,07 |
| Furnishings, household equipment, routine maintenance of the house | 5,42 | 8,32 | 65,13 |
| Clothing and Shoes | 3,96 | 6,25 | 63,38 |
| Entertainment and Culture | 4,30 | 6,85 | 62,81 |
| Education | 4,40 | 9,19 | 47,85 |
| Miscellaneous goods and services | 5,35 | 11,52 | 46,47 |
| Housing, water, electricity, gas and other fuels | 4,02 | 10,20 | 39,46 |
| Food and Beverages | 4,03 | 10,38 | 38,81 |
| CPI | 3,54 | 9,58 | 36,98 |
| Restaurant and Hotels | 3,49 | 12,55 | 27,80 |

*Source: TURKSTAT data*

When the coefficients of variations are analysed with the help of Table 3.7, the highest instability is observed in health, communication and alcoholic beverages and tobacco. It is noteworthy that there are high coefficients of variation in health and communication, which are the two groups with the lowest average inflation. It is possible to associate unstable price increases in alcoholic beverages, tobacco and health groups with the tax and payment policies of the public sector.

## *Developments in Deflators*

Another indicator that can be used in the evaluation of inflation developments is sectoral deflator. Deflators are more comprehensive indicators of inflation because of the change in the average price of all goods or services produced in a sector. In other words, Agriculture PPI, D-PPI and CPI give only the change in the average price of the goods and services covered, while the deflator gives the change in the average prices of all goods and services produced in the base year. Therefore, it is important to examine the developments in sectorial deflators.

Based on Table 3.8, the GDP deflator increased by an average of 8.8 percent per year in the 2003-2018 period, resulting to an increase in prices by 3.5 for all goods and services produced in the country at the end of 2018. In this duration, average prices increased by 3.8 times in services, 3.6 times in industry and 3 times in agriculture. Annual average inflation rates were 9.3 percent, 9 percent and 7.8 percent, respectively. According

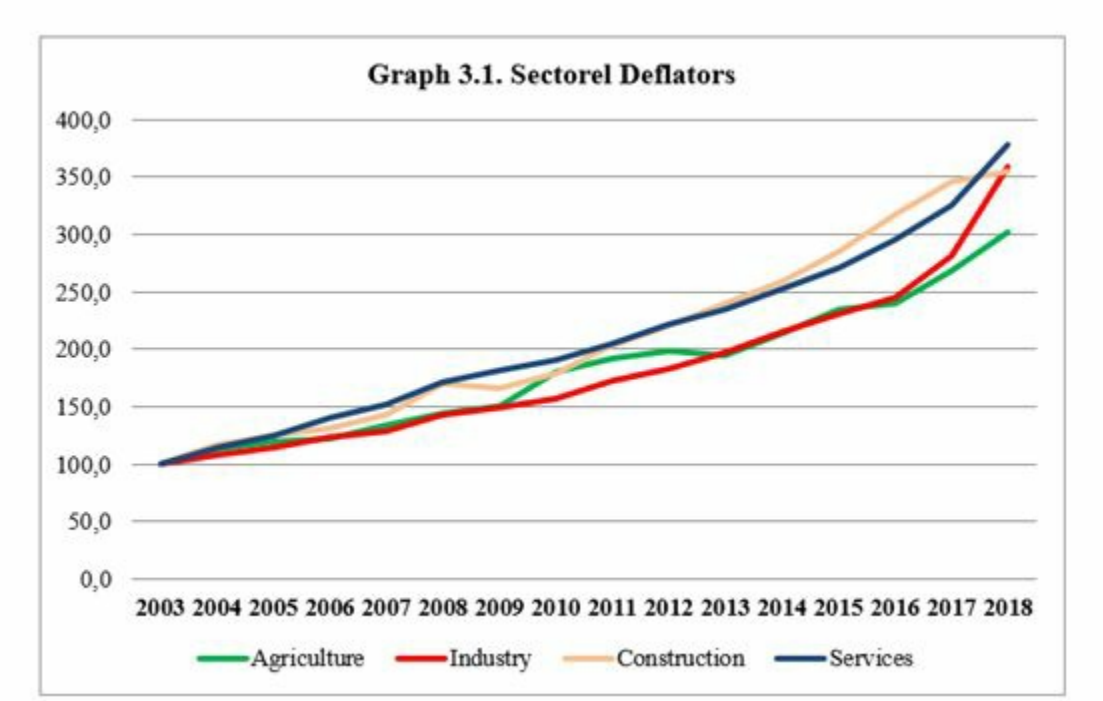
to these data, services made the largest and agriculture the least contribution to inflation. These data also point to sectors that need more attention in the fight against inflation.

**Table 3.8: Inflation by Sectoral Deflators**

| SECTOR | 2003-2018 Period increase (Times) | 2003-2018 Period Average Increase (%) |
|---|---|---|
| Mining and Quarrying | 5,8 | 12,7 |
| Education | 5,5 | 12,1 |
| Accommodation and Food Service Activities | 5,2 | 11,7 |
| Real Estate Activities | 4,7 | 11,1 |
| Public Administration and Defense; Compulsory Social Security | 4,8 | 11,1 |
| Human Health and Social Work Activities | 4,0 | 9,8 |
| **Services** | **3,8** | **9,3** |
| **Industry** | **3,6** | **9,0** |
| **Sectoral total** | **3,6** | **9,0** |
| **Construction** | **3,6** | **8,9** |
| Professional, Scientific and Technical Activities | 3,6 | 8,9 |
| Arts, Entertainment and Recreation | 3,6 | 8,9 |
| Manufacturing | 3,5 | 8,9 |
| Electricity, gas, steam and air conditioning supply | 3,4 | 8,8 |
| **Gross Domestic Product** | **3,5** | **8,8** |
| Administrative and Support Service Activities | 3,5 | 8,8 |
| Activities of Household as Employers | 3,5 | 8,7 |
| Transport, storage | 3,3 | 8,3 |
| Wholesale and Retail Trade | 3,2 | 8,3 |
| Water supply, sewerage, waste management and remediation activities | 3,2 | 8,2 |
| Other Service Activities | 3,1 | 7,9 |
| **Agriculture, forestry and fishing** | **3,0** | **7,8** |
| Taxes-Subsidies | 2,9 | 7,4 |
| Information and Communication | 2,7 | 6,8 |
| Financial and Insurance Activities | 2,3 | 6,3 |

***Source: TURKSTAT data***

On the other hand, in order to evaluate the developments in 2003-2018 periods on a yearly basis, the development of deflators in the period of 2003-2018 is given in Graph 3.1. It is observed that the highest price increase compared to the beginning of the period was in services, construction, and industry and agriculture sectors respectively.




Graph 3.2 shows the development of inflation by sectoral deflators on an annual basis. Here, it is seen that the price increases in the services and construction sectors are generally higher.

The coefficients of variation are given in Table 3.8 in order to assess the level of stability between inflation by sectoral deflators. From this point of view, the highest coefficient of variation in the main sectors is in agriculture, which is followed by services, construction and industry. Price fluctuations are expected to be higher due to the nature-dependent production structure of the agricultural sector. However, the analysis of the fluctuations in all sectors will make significant contribution to the fight against inflation.

Table 3.9: Variation in Inflation by Sectoral Deflators

| SECTOR | Standard Deviation | Average | Coefficient of Variation |
|---|---|---|---|
| **Gross Domestic Product** | **16,3** | **17,5** | **93,24** |
| Financial and Insurance Activities | 22,8 | 11,5 | 198,35 |
| Water supply; sewerage, waste management and remediation activities | 26,8 | 22,5 | 118,91 |
| Taxes-Subsidies | 23,2 | 19,7 | 117,98 |
| Electricity, gas, steam and air conditioning supply | 20,9 | 17,8 | 117,32 |
| Real Estate Activities | 26,4 | 23,0 | 114,84 |
| Information and Communication | 19,7 | 17,1 | 114,65 |
| Wholesale and Retail Trade | 18,1 | 17,3 | 104,55 |
| Other Service Activities | 19,4 | 18,7 | 103,91 |
| Transport, storage | 17,8 | 17,3 | 102,95 |
| Professional, Scientific and Technical Activities | 20,5 | 20,0 | 102,62 |
| Activities of Household as Employers | 18,6 | 18,6 | 99,95 |
| Administrative and Support Service Activities | 18,3 | 18,4 | 99,00 |
| **Agriculture, forestry and fishing** | **15,34** | **15,70** | **97,70** |
| Human Health and Social Work Activities | 19,9 | 20,4 | 97,42 |
| Arts, Entertainment and Recreation | 17,1 | 18,0 | 94,76 |
| **Services** | **17,3** | **18,4** | **94,51** |
| **Construction** | **14,7** | **15,7** | **93,22** |
| **Sectorial total** | **15,7** | **17,3** | **90,59** |
| **Industry** | **14,7** | **16,5** | **89,28** |
| Manufacturing | 14,1 | 15,9 | 88,56 |
| Public Administration and Defense; Compulsory Social Security | 17,5 | 20,1 | 86,75 |
| Mining and Quarrying | 18,7 | 22,3 | 83,97 |
| Education | 18,3 | 21,8 | 83,95 |
| Accommodation and Food Service Activities | 15,0 | 19,6 | 76,38 |

***Source: TURKSTAT data***

# FACTORS AFFECTING THE INFLATION BY SECTORAL DEFLATORS

At this stage of the study, with reference to sectoral deflators, the inflation of each sector in relation to growth, population growth rate, budget deficit, treasury borrowing interest, exchange rates, minimum wage, oil prices and market structures will be evaluated with correlation coefficients. The calculations made within this framework are given in Table 4.1.

Indicators listed here;

- Growth; the annual growth rate of each sector,
- Population; average annual population growth rate,
- Budget deficit; annual change in the budget balance,
- Treasury interest; annual compound average borrowing interest,
- Minimum wage; the annual minimum wage increase rate,
- Oil prices; annual rate of change in oil prices,
- The foreign exchange basket represents the annual rate of change in the foreign exchange basket, which consists of half US dollars and half euros.

According to the data in the table, the highest correlation coefficient of deflator inflation in agriculture, forestry and fishery sector; is on population growth (0.3339) and growth rate of the sector (0.293) and oil prices (0.268). In other words, an increase in these variables causes increases in agricultural deflator and vice versa. These data point to the importance of decreasing population growth rate and stabilizing oil prices in preventing agricultural inflation.

**Table 4.1: Inflation by Sectoral Deflators and the Factors Affecting Them**

| SECTOR | Growth * | Population growth ** | Budget Deficit ** | Treasury interest * | Minimum wage ** | Petrol Prices** | Currency basket *** |
|---|---|---|---|---|---|---|---|
| **Agriculture, forestry and fishing** | **0,293** | **0,339** | 0,047 | 0,188 | 0,080 | 0,268 | -0,027 |
| **Industry** | -0,061 | 0,200 | -0,058 | 0,213 | -0,032 | **0,335** | **0,768** |
| Mining and Quarrying | 0,205 | -0,074 | -0,070 | **0,741** | 0,234 | **0,665** | 0,232 |
| Manufacturing | 0,000 | 0,188 | -0,122 | 0,149 | -0,015 | **0,312** | **0,775** |
| Electricity, gas, steam and air conditioning supply | **-0,382** | 0,315 | **0,401** | 0,303 | -0,289 | 0,109 | 0,312 |
| Water supply, sewerage, waste management and remediation activities | -0,241 | 0,135 | **0,411** | -0,171 | -0,254 | 0,005 | **0,600** |
| **Construction** | 0,338 | **-0,373** | **-0,391** | 0,247 | **0,395** | 0,332 | -0,321 |
| **Services** | 0,025 | -0,280 | -0,082 | **0,797** | 0,370 | **0,444** | 0,303 |
| Wholesale and Retail Trade | 0,187 | -0,005 | -0,310 | 0,378 | 0,157 | **0,480** | **0,521** |
| Transport, storage | 0,218 | -0,061 | -0,103 | **0,373** | 0,093 | 0,291 | **0,594** |
| Accommodation and Food Service Activities | -0,012 | -0,125 | -0,189 | **0,861** | **0,475** | **0,474** | 0,122 |
| Information and Communication | -0,066 | -0,051 | **0,253** | 0,078 | -0,219 | -0,072 | **0,498** |
| Financial and Insurance Activities | -0,015 | **-0,351** | **0,548** | 0,090 | 0,151 | -0,289 | 0,284 |
| Real Estate Activities | **-0,557** | -0,497 | -0,049 | **0,907** | 0,306 | 0,347 | -0,388 |
| Professional, Scientific and Technical Activities | -0,149 | -0,114 | 0,127 | **0,661** | 0,177 | 0,362 | **0,452** |
| Administrative and Support Service Activities | -0,496 | -0,010 | 0,021 | **0,516** | 0,057 | **0,547** | 0,513 |
| Public Administration and Defense; Compulsory Social Security | 0,352 | 0,047 | 0,023 | **0,597** | **0,396** | 0,355 | 0,101 |
| Education | -0,572 | 0,006 | -0,077 | **0,604** | **0,734** | 0,183 | -0,094 |
| Human Health and Social Work Activities | -0,098 | -0,325 | -0,093 | **0,770** | **0,641** | 0,300 | -0,082 |
| Arts, Entertainment and Recreation | **0,272** | 0,090 | 0,006 | 0,161 | -0,091 | 0,162 | **0,184** |
| Other Service Activities | 0,097 | 0,261 | -0,257 | -0,090 | **-0,263** | 0,154 | **0,264** |
| Activities of Household as Employers | 0,177 | -0,111 | -0,103 | **0,592** | 0,235 | **0,413** | 0,365 |
| **Sectorial total** | **0,026** | **-0,051** | **-0,088** | **0,593** | **0,249** | **0,458** | **0,493** |
| **Taxes-Subsidies** | 0,052 | 0,186 | -0,464 | 0,076 | 0,398 | 0,181 | 0,277 |
| **Gross Domestic Product** | **0,005** | **-0,014** | **-0,162** | **0,559** | **0,297** | **0,454** | **0,505** |

*(*) %, (**) % Increase, (***) (0,5 $ + 0,5 €) % increase*

The highest and positive correlations with the deflator inflation in the industrial sector are; exchange basket (0.768), oil prices (0.335) and Treasury interest (0.213). These data reveal the importance of stability in exchange rates and oil prices in the fight against industrial inflation.

The highest positive correlation coefficient of deflator inflation in the construction sector is the minimum wage (0.395), and treasury interest (0.797) and oil prices (0.444) in the services sector. The table also shows that deflator inflation as the average of all sectors; has a high correlation between Treasury interest (0.593), foreign exchange basket (0.493) and oil

prices (0.458). These coefficients provide the necessary information related to the sectoral dimension in the fight against inflation and point to the necessity of reducing public borrowing requirement in order to lower interest rates, stabilizing exchange rates and decreasing taxes on oil prices.

Another indicator that can be taken into consideration in order to evaluate the sources of inflation in the sectoral dimension is the concentration rates. For this purpose, Table 4.2 presents the average CR4, CR8 and Herfindahl index data for the period 2009-2015 published by TURKSTAT. Concentration coefficients (CR) represent the total revenue/market share of largest k number of enterprises in the total revenue of n enterprises revenue/market in an economic activity class. Therefore, CR4 is the sum of the four largest companies and CR8 is the sum of the eight largest firms. The Herfindahl index is the sum of the squares of the share of all enterprises in the activity class in the total revenue in that category. (http://www.tuik.gov.tr/PreTablo.do?alt_id=1036. 28.09.2019).

According to the data in Table 4.2, the highest concentration coefficients for all indicators are in the production and distribution of electricity, gas, steam air conditioning, transportation and storage, information and communication, and mining and quarrying. In addition to this, the sectors with the highest inflation rate are education, accommodation and food service activities, water supply; sewage, waste management and improvement activities. These data can be interpreted as the fact that both the concentration rates and consistent behaviour structures are evident even if the concentration rates are low and the pricing preferences of the local public units have an effect on inflation. Therefore, the necessity of increasing controls on market structures and market behaviour, namely the that the competition authorities should be more active may be highlighted.

**Table 4.2: Inflation by Sectoral Deflators and Concentration Rates**

| | 2009-2015 | | | |
|---|---|---|---|---|
| SECTION | CR4 | CR8 | Herfindahl indeksi | DEF. Enf. |
| Mining and Quarrying | 63,15 | 75,40 | 0,22 | 8,2 |
| Manufacturing | 49,57 | 60,50 | 0,16 | 7,0 |
| Electricity, gas, steam and air conditioning supply | 70,62 | 80,46 | 0,37 | 6,8 |
| Water supply, sewerage, waste management and remediation activities | 59,60 | 73,02 | 0,18 | 8,7 |
| Construction | 23,40 | 30,36 | 0,04 | 7,8 |
| Wholesale and Retail Trade | 24,30 | 31,15 | 0,05 | 6,0 |
| Transport, storage | 49,03 | 57,65 | 0,23 | 6,1 |
| Accommodation and Food Service Activities | 20,54 | 25,70 | 0,03 | 8,8 |
| Information and Communication | 59,76 | 69,31 | 0,22 | 6,1 |
| Real Estate Activities | 19,37 | 27,42 | 0,02 | 6,1 |
| Professional, Scientific and Technical Activities | 29,42 | 37,67 | 0,06 | 7,1 |
| Administrative and Support Service Activities | 49,80 | 58,20 | 0,19 | 6,6 |
| Education | 31,42 | 41,63 | 0,06 | 10,6 |
| Human Health and Social Work Activities | 22,12 | 31,27 | 0,04 | 7,1 |
| Arts, Entertainment and Recreation | 56,17 | 64,19 | 0,21 | 8,2 |
| Other Service Activities | 21,47 | 26,12 | 0,05 | 7,1 |

***Data on concentration rates are calculated as the average of sub-sector data for 2009-2015 periods. Inflation rates by sectoral deflators are the average of 2009-2015 periods. Source: http://www.tuik.gov.tr/PreTablo.do?alt_id=1036***

# CONCLUSION AND RECOMMENDATIONS

Within the framework of the above analysis;

1. Turkey is one of the countries with relatively high inflation in the world for the longest period (1975-2019).
2. Among the countries with certain size of their national economies, Turkey is the most unsuccessful country in the fight against inflation.
3. The fact that people under the age of 45 haven't lived in a period of low inflation for a long time has caused a large mass of people to adopt a behaviour consistent with inflation (**expected inflation**) and this made the fight against inflation more difficult.
4. Inadequate development of democratic standards caused high expectations from the state/political institutions and this led to the implementation of populist policies and inflation has become permanent **(demand and cost inflation).**
5. High demand for consumption through rapid population growth, expectations of high consumption, as well as increased access to credits has kept **demand inflation** on the agenda.
6. On the other hand, rising dependence on external inputs and resources has contributed to the external inflationary processes. As a matter of fact, the increase in the inflow of foreign resources paved the way for demand inflation thanks to low real exchange rate causing increased

demand for imported goods. As a result, increasing external deficits, the escape of speculative capital led to **cost inflation with the increase in exchange rates.**

7. In line with the increased openness in the post 1980 period, the inflow of global inflationary processes has also become easier (**imported inflation**), and the fact that the price advantages brought by the increasing competition process often turned into intermediary profits made the use of anti-inflationary effect potential difficult.
8. Adverse developments in agriculture have caused the growth rate in the sector to fall behind the population growth rate, which led to an increase on the cost of living and expected wages and this has fuelled **wage-side cost inflation** in the industrial and services sectors. Lack of supply in agriculture has also contributed to the inflationary process in the agro-industrial sectors.

As seen, the inflation in Turkey has become a self-fulfilling phenomenon, so the inflation has become a more difficult problem to solve. The bill that has to be paid to combat inflation has grown and the fact that both politicians and the public do not want to pay this bill has turned the situation into a mess.

In a country with such chaotic dynamics of inflation, ignoring the structural and systemic dimensions and resorting only to monetary and fiscal policies to overcome the problems has failed. Inflation, which declined as a result of artificial appreciation of the national currency due to the global liquidity conditions, has caused policy makers to perceive the developments as “success” and made them feel “comfortably numb”. With the reversal of the global conditions, the inflation has been triggered through its existing dynamics and rose again rapidly.

The case of Turkey, so far, has provided a story of failure in the analysis of inflation perceptions and dynamics and in the creation of a suitable policy mix. The developments at the global level and the domestic economic necessities have made it impossible to live with high inflation. Turkey has to solve this problem permanently by eliminating the reasons instead of eliminating the results.

In this context, in the fight against inflation;

1. The opportunities provided by monetary policy should be used effectively, but the limitations of these opportunities should not be forgotten.
2. Turkey should ensure exchange rate stability, with its national currency valued at a realistic level and for this it should have a

healthy economic structure that will not allow speculative movements of external resources to turn into speculative attacks. This can only be achieved with the innovative production power of the economy and the education system that will feed it. The existing education system has neither the quality nor the content to contribute to the increase in the production capacity and the fight against inflation.

3. The public sector should be restructured related to its staff, both in terms of merit level and ethics of the expenditure. Performance based career system should be adopted in the public sector.
4. The budget balances in Turkey is extremely collapsed. Debts are increasing rapidly. This structure also makes it difficult for interest rates to fall. Budget balances should be improved again, with particular emphasis on the fight against the informal economy.
5. The population growth rate in Turkey should be reduced. The current rate of population growth, illegal immigration and asylum seekers, it is becoming more difficult to fight against the inflation.
6. Dependence on external energy resources and exchange rate instability are both important determinants of inflation. Therefore, existing and abundant renewable energy resources should be considered and utilized as effectively.

From the perspective of this study;

1. The sectoral sources of inflation in Turkey in the fight against inflation should also be taken into consideration. Because;

a) Cyclically and/or structurally some of the sectors may contribute to inflation in various periods whereas others contribute regularly at each period.
b) Depending on the sectors, the inflationary process shows different indications of instability in time. This is a situation that makes it difficult to fight against inflation.
c) Agriculture has become a key sector in the fight against inflation because it meets the needs of food (CPI) and raw material (D-PPI) of the industry. It is impossible to solve this problem without making proper production and producer/manufacturer planning.
d) It is also difficult to control the unstable inflation in the industrial sector due to the existing dependence on imported inputs and the capital structures of the companies. The industrial sector should be restructured.
e) It is seen that there are uncontrolled and arbitrary pricing practices

in the services sector.
For each sub-sector "future strategy" should be developed.

f) In many industries, market structures are far from being competitive. The Competition Authority must be more effective.

g) Inter-sectoral relations/chain is also an important source of inflation. A monitoring system should be established in order to control.

In sum, Turkey will not be able to solve its other economic problems without reducing inflation to the level of developed countries (2-3 percent), Economic policy makers need to take this reality into account.

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