Factors Affecting the Development of the Service Sector in Turkey: An Econometric Investigation

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Abstract – Since the second half of the 20th century, the service sector has shown a rapid expansion trend, first in developed countries and then in developing countries. Türkiye is not an exception in this regard. In the last 50 years a rapid shift of services sector has been witnessed in Türkiye. So, it is important to analyze the expansion dynamics of the service sector correctly so that the structural change to take place in a healthier and more controlled manner. Findings from cointegrated regression methods reveal that income level, openness ratio, and education level contribute positively to the development of the service sector. On the other hand, foreign direct investment inflows and the increase in the productivity of the industrial sector have a negative impact on the development of the service sector.

Keywords – Service Sector, Sectoral Change, Time Series Analysis, Turkey.

I. INTRODUCTION

The economic evolution of the world determined an increasing importance for service sector (tertiary) activities. This was particularly important in the last decades, in which globalization, economic restructuring and many other processes have accelerated the rhythm of urbanization and "tertiarization" of economic activities. For developing economies, this process is even more intense, given their late entrance into the globalization process and lower level of tertiarization they started with [1]. During the 1950s and 1960s, research by Kuznets and Chenery suggested that development would be associated with a sharp decline in proportion of GDP generated by the primary sector, counterbalanced by a significant increase in industry and a modest increase in the service sector. Furthermore, the modern view also suggests that the share of agriculture declines as the economy grows with an increase in the service sector, and the share of industry first increases and then stabilizes or declines [2].

The contraction of the agricultural sector while the service sector grows is typical of the growth processes of developing countries [3]. As a country industrializes, the share of the service and industry sectors in GDP and employment increases, while the share of the agricultural sector decreases. In the post-industrial period, while the share of the service sector continues to increase, the shares of the industry and agriculture sectors gradually decrease [4]. [5] analyzed a sample of 123 countries and shown that rising per-capita GDP is associated with an increase in services and a decline in agriculture both in terms of share in GDP and employment. In other words, the sectoral share given up by agriculture as the economy matures goes more to the services sector and less to industry than the Kuznets-Chenery work had suggested. The modern view is that as an economy matures, the share of services (in output, consumption, and employment) grows along with a decline in agriculture.

The three-phase model of [6] and [7] allocates agriculture and mining to the first, primary stage; manufacture to the secondary stage and the rest to services, the tertiary stage of economic

development. Such a growth process was derived from a model that emphasized certain surplus-producing industries [8]. In broad sense, the term "services", which are often called the "tertiary sector" or "residual sector" of the economy, covers a wide range of intangible and different products and activities such as transport and logistics, telecommunications and computer services, construction, financial services, wholesale and retail distribution, hotel and catering services, insurance, real estate, health and education, professional marketing and other business support, government, community, audiovisual, recreational and domestic services [9]. Despite the definitional differences between goods and services, it should be emphasized their growing complementary and symbiotic relationship in the modern economy, the distinction between the two often becomes arbitrary. Many manufactured goods include a substantive service component. An efficient service sector is increasingly viewed as a prerequisite for economic growth, and this particularly true for the knowledge-based services where high value is placed on intellectual capital [10].

The service sector constitutes a large part of the economic activities of developed and most developing countries. As seen in Table 1, although the service sector constitutes the largest part of economic production in all countries around the world in the last 20 years, the share of the service sector gradually increases as the income level of the countries increases. In developed high-income countries, the service sector accounts for more than 2/3 of the GDP, while the share of the agricultural sector is below 2%. While the share of the service sector in middle-income developing countries has increased over 1/2 over time, it is seen that this is at the expense of the shrinkage of the share of the agricultural sector. In low-income underdeveloped countries, the share of the service sector does not show much improvement over time, unlike the economies in the other two income groups (2000-2020 average 41%), agriculture and industry go hand in hand.

Table 1. Shares of sectoral value added in countries with different income levels (% of GDP)

Country Group	High Income			Middle Income			Low Income		
Year	Agri.	Industry	Service	Agri.	Industry	Service	Agri.	Industry	Service
2000	1.64	26.53	66.84	10.95	33.91	49.11	27.27	28.81	40.36
2005	1.42	25.13	67.73	9.76	35.62	48.55	24.32	28.63	40.71
2010	1.33	23.89	68.98	9.13	35.71	49.49	23.55	28.29	42.85
2015	1.32	22.79	69.89	9.02	33.60	52.86	25.87	22.25	42.30
2020	1.28	22.03	71.03	9.26	32.75	54.16	26.22	26.32	38.92

Source: The World Bank, WDI.

Several factors have contributed to the growth of service sector. Besides the "natural" reasons, new telecommunications and computer technologies have had a major impact on the service sector, enhancing their tradability. In particular, they have created the possibility of cross-border exchanges in any services that were not transportable before (e.g. education), and have facilitated trade in the already tradable services (e.g. in retail trade). Technological innovations have reduced the need for foreign direct investment as an exclusive mode of supply in many sub-sectors (e.g. banking, business services) [10]. Technological advances and business innovations have been widened, accelerated and differentiated service sectors globally.

The development of the service sector in terms of volume and efficiency has a direct and indirect effect on the economy [11], [12]. The growth of the sector's volume directly leads to an increase in income due to the increase in output created on the one hand and the expansion in employment on the other. The services sector has strong linkages with other major sectors of the economy. It is also strongly embedded in the sale and purchase of primary commodities and manufactured goods [13]. On the other side, the increase in the quality and efficiency of services such as transportation and communication indirectly contribute to the economy by causing growth in other sectors with its forward connection effects.

The service sector differs from the agricultural and industrial sectors in various aspects in terms of its production structure. Service products are generally consumed when and where they are produced (inseparability), cannot be stored (perishability), and are based on human-human interaction (heterogeneity). These features allow the service sector to work with lower costs and provide greater

mobility. A service-producing company is less faced with many difficulties such as storage costs, defective or expired products, delivery disruptions, and problems in the supply process.

Another difference arises in terms of production and investment costs. Compared to agriculture and industry, it can be said that fixed and variable costs are much lower in the service sector, and scale change is easier. This situation brings the service sector to be more dynamic and have a higher growth potential. Yet another aspect of the service sector that differs from agriculture and industry is that it is more open to innovations and provides more opportunities for the emergence of new production lines.

Although these differences seem to be advantages in favor of the service sector, it is necessary to mention some of the difficulties that the sector faces. High international competition, rapid technological change and progress, and the variable expectations of consumers pose unprecedented challenges for service sector companies from time to time [14]. Companies that have difficulty in responding to these changes and expectations may lose their competitive advantage and power.

II. DEVELOPMENT OF THE SERVICE SECTOR IN TURKIYE

In Turkey, which was still an agrarian society in the years when the Republic was established, the weight of agriculture in the economy began to decline with the initiative of industrialization, and a significant development trend was achieved in the service sector with the adoption of the liberalization policy in the early 1980s. The service sector has gained greater importance compared to the agriculture and industry sectors. In particular, the share of the agricultural sector has declined considerably. It can be said that demographic and social change had also been effective in this process as well as sectoral transformation.
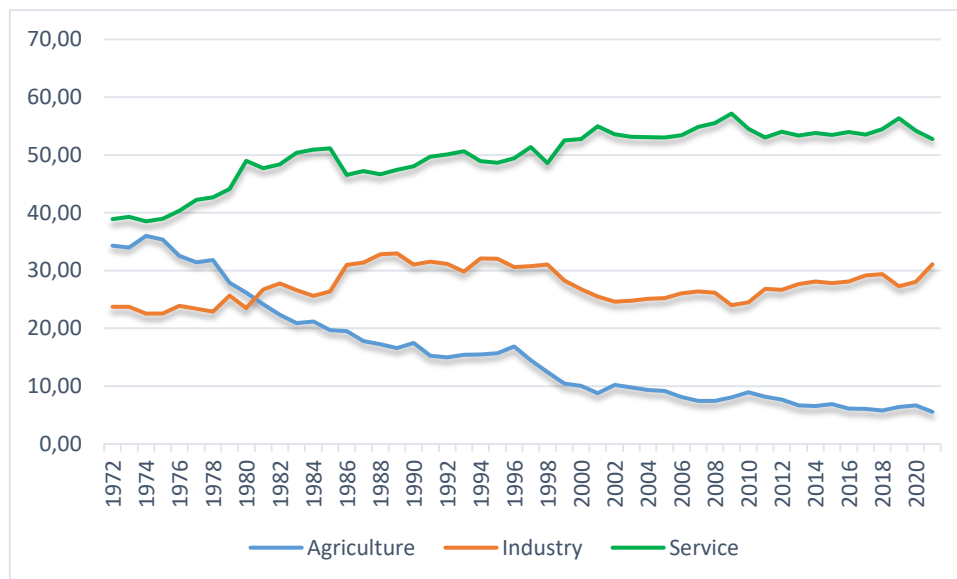

Figure 1. Sectoral decomposition of value added in Türkiye's economy (% of GDP)

Since the 1950s, the increase in urbanization as a result of the migration of idle labor from the countryside to the city due to increased mechanization in agriculture brought along the shift of employment from agriculture to industry and services. In the Turkish economy, where a trend towards deindustrialization is observed, the services sector has gradually gained importance [15]. As can be seen in Figure 1, the share of agriculture decreased from 34% to 6% in the period from 1972 to 2021. The share of the industrial sector followed a relatively stable course in the same period and fluctuated within the band of 25-35%. The share of the services sector, on the other hand, has increased greatly in the last 50 years, from 35% to 61%. Examining the correlation between sectoral shares it is seen that there is a high and negative correlation (-0.94) between the agriculture and service sectors, and a low positive correlation (0.22) between the industry and the service sector. This indicates that

the expansion in the service sector is mostly fed by the agricultural sector. The relationship between agriculture and industry is lower (-0.38).

Sectoral behavioral differences are also evident in growth rates. Looking at the rates given in Figure 2, it is seen that the growth rates in the service sector have fluctuated relatively less in the last 50 years compared to the other two sectors and generally have positive values. On the other hand, it is observed that the agricultural and industrial sectors frequently contracted, and especially the industrial sector was severely affected by the 2001 and 2008 economic crises.

Although the share of the service sector in Turkey has generally increased over time, it cannot be said that this expansion is based on solid foundations.

Although the service sectors take the lead in terms of the number of firms and production value, it is seen that the industry sector is ahead of the service sector in terms of labor efficiency. Looking at the firm-level data published by the Turkish Statistical Institute (TURKSTAT), as of 2021, the share of enterprises in industry and services in the total number of enterprises excluding agriculture and mining is 12.4% and 87.4%, respectively, while the share of these enterprises in production is 49.6% and 47.5% respectively. In terms of employment shares; the share of employees in the total number of enterprises excluding agriculture is 26.9% in industry and 72.3% in services. This situation, which [15] describes as "premature servitization", is also supported by the empirical findings of [16].
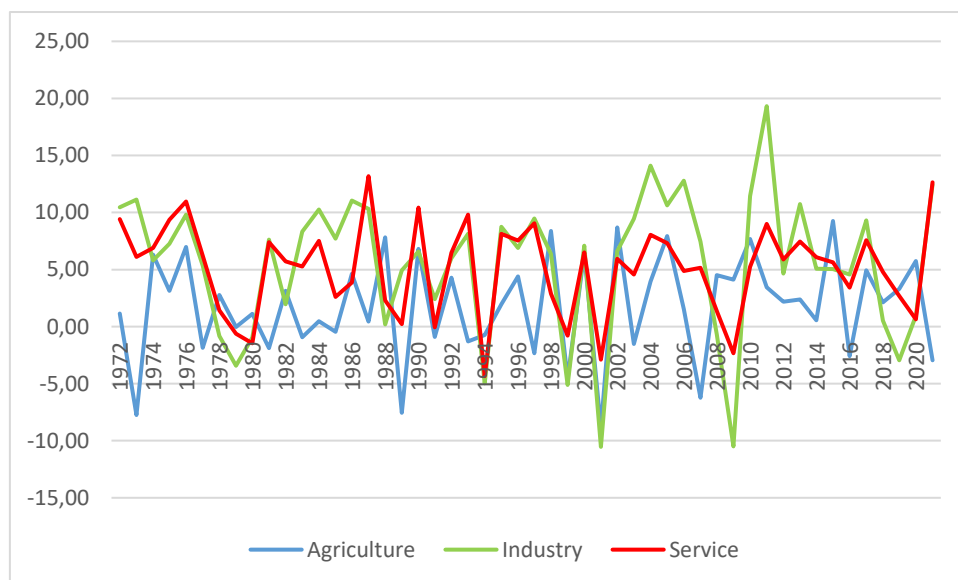

Figure 2. Sectoral growth rates in Turkiye's economy.

III. RELATED LITERATURE

With the increased interest in growth theory, empirical work on economic growth has expanded enormously in the last decade. Most of this literature mainly focuses on the determinants of aggregate economic growth, however, while there has been less emphasis on sectoral economic growth. The sectoral growth literature builds mainly on the dual economy model originating from [17] and [18]. This model seeks to explain economic growth by emphasizing the roles of agriculture and industry and the interplay between them.

Although the service sector has become dominant in the economy in many countries since the mid-20th century, surprisingly it is seen that the growth dynamics of the service sector have not been

adequately examined empirically until recently. It can be said that there is burgeoning empirical literature on the issue at hand. Different empirical studies have suggested different factors as determinants of growth in services sector. Income per capita, productivity difference, innovations, FDI and trade openness are the most common factors suggested by different empirical studies as determinants of service sector's growth.

China and India have recently achieved spectacular economic growth. However, services in these two Asian giants have played a very different role. To provide an explanation for the contrasting trajectories, [19] examines and compares service sector developments in these two Asian economies. According to estimates, both per capita income and

urbanization has positive and statistically significant effect on service growth. In addition, it is found that external demand also has a positive impact on service development among the countries. This partly explains the phenomenal growth of IT service exports in India. The cost of services is shown to have a negative effect, but the estimated coefficient is statistically insignificant. [20] also attempted to study in detail the Indian services sector growth over the years and estimate the determinants of service sector growth in India by using VAR analysis. The results of their analysis show that the growth of per-capita GNP is major factor of increasing share of services sector in Indian economy. Domestic investment and openness also effect positively to the share of services sector in GDP. Further, the effect of net FDI inflows is negative and insignificant. They concluded that the reason of this negative effect might be the increasing share of FDI inflows in manufacturing sector, which in turn reduce the share of services in total proportion.

[21], in their research based on survey data, concluded that the increase in the sales of companies operating in the service sector in Rwanda, innovative products and profitability contribute to the development of the service sector, which in turn contributes to economic growth. [22] examined the factors affecting service sector growth and development in Botswana. Using annual time series data from 1980 to 2015, the study employs the ARDL estimation technique to identify the factors that contribute to service sector growth. The results show that gross national expenditure, domestic credit to the private sector and gross fixed capital formation contribute positively to the growth of the service sector in Botswana. However, trade openness is found to negatively impact the growth of service sector in the country.

[23] addressed the issue in a panel data analysis setting and examined the possible factors that determine the services sector growth, both in selected developed and developing economies. For estimation purpose, the study employs the static as well as the dynamic panel data estimation technique with panel data over the period 1990-2014. The results suggest that GDP per capita, FDI net inflow, trade openness and innovations are the common factors that significantly affect the services sector growth both in developed and in developing economies. However, the productivity gap is the only factor that does not have any significant impact

on services sector growth, both in developed and developing economies, which indicates that the Baumol's cost disease has been cured.

Using the annual data over the period of 1975–2015 and applying the ARDL approach, [24] examines the main determinants of services sector growth of Pakistan. In addition, Granger causality technique has been used to investigate the causality between the variables. Their findings reveal that per capita income, capital accumulation and urbanization positively contribute to the services sector growth. However, negative impact of trade liberalization has been observed on services growth of Pakistan. Hence, they conclude that greater focus on the quality parameters of services sector is needed so that it may become more competitive in the world.

There are various competing explanations as to the structural change and rapid expansion of service sector within an economy. Among these explanations the secular trend and the Bacon-Eltis views are seem more relevant to the process of structural change in most of the developing countries. [25] examined the relevance of both views for India, Sri Lanka and Pakistan. He employed regression techniques for individual country analysis. The empirical findings of this study seem to support the relevance of both the secular trend and the Bacon-Eltis views to these countries, though the empirical evidence in support of the Bacon-Eltis thesis is less robust than that of the secular trend view.

IV. EMPIRICAL ANALYSIS

A. *Method, Model and Data*

Since the expected value of most macroeconomic variables can be determined conditionally to past values, it can be thought that a dynamic model structure will represent the relationship well. In this respect, the following general ARDL(p, q) model, which includes a certain number of lagged values of the dependent and independent variables as the explanatory variable, conforms to the nature of the relationship studied here.

Econometric analysis consists of cointegration (bounds) test based on ARDL model, and long and short-term coefficients estimates. The ARDL bounds test, developed by [26] and [27], is a cointegration test method that is widely used in time series regressions due to its advantages over other methods and is suitable for investigating the

relationships between variables with the mixed order of integration.

The linear ARDL(p, q) model for a bivariate (Y and X) case can be written as:

$$\Delta Y_t = \mu + \sum_{i=1}^{p} \alpha_i \Delta Y_{t-i} + \sum_{j=0}^{q} \delta_j \Delta X_{t-j} + \beta_1 Y_{t-1} + \beta_2 X_{t-1} + \varepsilon_t$$

The null hypothesis that there is no cointegration relationship between the variables can be tested using the modified-F, Wald test or t test. After proving the existence of the cointegration relationship, in the second step, the long-term relationship between the variables is estimated with the help of the equation below.:

$$Y_t = \eta + \sum_{i=1}^{p} \theta_i Y_{t-i} + \sum_{j=1}^{q} \beta_j X_{t-j} + u_t$$

Finally, the existence of the short-term relationship between the variables is also examined through the error correction model below.:

$$\Delta Y_t = \omega + \sum_{i=1}^{p} \alpha_i \Delta Y_{t-i} + \sum_{j=1}^{p} \delta_j \Delta X_{t-j} + \varphi ECM_{t-1} + \upsilon_t$$

The difference terms in the ARDL equation are error correction components and reflect the short-run relationship. Lagged level terms represent a long-run relationship. Therefore, in the first stage of the analysis, the above ARDL model is estimated by the OLS method, and the null hypothesis of $\beta_0 = \beta_1 = \cdots = \beta_k = 0$ is tested with the Wald test against the alternative hypothesis $\beta_0 \neq \beta_1 \neq \cdots \neq \beta_k \neq 0$. This stage, in which the cointegration relationship between the variables is investigated, is called the "bounds test" in the literature. An F value large enough to allow rejecting the null hypothesis means that the variables are cointegrated [28].

B. *Stationarity Analysis*

The stationarity feature of the variables was investigated via Augmented Dickey-Fuller (ADF) and Kwiatkowski et al.'s (KPSS) test (Table 2). According to the ADF test, Openness variable is stationary as of its level values, all other variables appear to be stationary in terms of their first differences. The results of the KPSS test show a more mixed appearance in level values. But as a result, it is clear that none of the variables are I (2) according to both methods.

Table 2. ADF and KPSS Unit-root tests results

	ADF		KPSS	
	c	$c + t$	c	$c + t$
LSER	0.1739 (0.9662) −3.5138	−2.6795 (0.2513) −3.6410	0.7324 1.1604	0.1386 −3.4729
LGDPPC	0.1739 (0.9662) −3.5138	−2.6795 (0.2513) −3.6410	0.7204 0.4205	0.1529 −2.8282
LFDI	−1.1868 (0.6668) 1.5998	−1.8328 (0.6634) 1.6420	0.6009 3.5121	0.1311 2.3226
LPDIF	1.3518 (0.9982) −0.1636	−2.9331 (0.1669) −0.3208	0.6751 1.9917	0.2011 0.0896
OPEN	−2.9645 (0.0499) −4.8597	−0.6656 (0.9668) −4.7993	0.5564 −1.7612	0.1954 −2.6915
EDU	−0.7752 (0.8073) −6.0284	−1.7377 (0.7011) −6.0931	0.7373 −1.0448	0.1031 −4.4098
$\Delta LSER$	−5.7303 (< 0.01) −3.5026	−5.6278 (< 0.01) −3.3967	0.2224 −3.6261	0.2298 −3.5186
$\Delta LGDPPC$	−5.7303 (< 0.01) −3.5026	−5.6278 (< 0.01) −3.3967	0.2945 −3.2827	0.1698 −3.1921
$\Delta LFDI$	−5.4170 (< 0.01) 1.6846	−5.3350 (< 0.01) 1.7957	0.1306 1.5355	0.1127 1.6459
$\Delta LPDIF$	−5.4301 (< 0.01) −0.2059	−6.1933 (< 0.01) −0.2685	0.3384 −0.2342	0.1927 −0.1575
$\Delta OPEN$	−4.6534 (< 0.01) −4.5615	−6.5154 (< 0.01) −4.8246	0.6305 −4.7001	0.5000 −4.8964
ΔEDU	−3.0977 (0.0403) −4.2147	−3.5841 (0.0528) −4.2302	0.3623 −4.2446	0.3495 −4.1317

Note: In the ADF test, the lag length is determined according to the SIC. Critical values for KPSS test: Constant: 0.7390 (1%); 0.4630 (5%); 0.3470 (10%); constant + trend: 0.2160 (1%); 0.1460 (5%); 0.1190 (10%), bandwidth was determined according to the Newey-West method. The Δ sign indicates the first difference of the series. Values in parentheses indicate the p-value, and those at the bottom indicate the SBC value.

C. *Cointegration Analysis*

The existence of a statistically significant long - term relationship between the variables has been investigated by the ARDL bounds test described above. The calculated F-statistic value points to the existence of a long-term relationship between the variables (Table 3). Accordingly, a regression relationship between the level values of variables will not be spurious.

Table 3. Result of ARDL bounds test for co-integration.

Variables	F-statistic	Significance level	Critical values	
			I(0)	I(1)
LSER, LFDI LGDPPC LPDIF OPEN, EDU	104.7659	%10	3.157	4.412
		%5	3.818	5.253
		%1	5.347	7.242

The estimates of the regression equation between the level values of the variables that reflects the long-term relationship are shown in Table 4. According to the findings, as the income level and the productivity gap between the service sector and the industrial sector increase, the service sector develops more. On the other hand, foreign direct investment inflows, degree of openness to foreign trade and education level seem to have negative effect on the volume of service sector in Türkiye. Besides its adverse sign, the impact of FDI is statistically insignificant and weak.

Table 4. Long-term estimates (Dependent variable: *LSER*)

Variable	Coefficient	St. Error	t statistic	p value
LGDPPC	1.1344	0.0483	23.4922	< 0.01
LFDI	− 0.0069	0.0043	− 1.5875	0.1635
LPDIF	0.2060	0.0256	8.0537	0.0002
OPEN	− 0.4953	0.1016	− 4.8752	0.0028
EDU	− 0.2254	0.0327	− 6.8879	0.0005
ECM	− 0.5974	0.0176	− 33.9474	< 0.01
B-G	2.5440	p value	0.1716	
White	2.7435	p value	0.1069	
RESET	0.4334	p value	0.5394	
J-B	0.2264	p value	0.8930	
CUSUM	Stable	CUSUM2	Stable	

Note: *i*. B-G: Chi-square statistic of Breusch-Godfrey autocorrelation test, *ii*. White: chi-square statistic of varying variance test, *iii*. RESET: Ramsey's specification error test chi-square statistic, *iv*. CUSUM: Parameter stability test.

Signs of the estimated coefficients are not compatible with theoretical expectations. To obtain more acceptable and reliable estimates cointegrated regression equation has been estimated by employing Fully Modified OLS (FMOLS) and Dynamic OLS (DOLS) methods and results have been reported below. Though they differ in magnitude both methods gave similar results. Common findings are as follows: per capita income level, openness to trade, and educational development have positive and significant impacts on the service sector. Both the FDI inflows and intersectoral productivity gap have a negative impact on the service sector whereas the significance of the latter is not precise.

Table 5. Results of cointegrated regression estimates

Variable	FMOLS		DOLS	
	Coefficient	p value	Coefficient	p value
Constant	17.1470	0.0000	20.8083	0.0000
LGDPPC	1.0676	0.0000	0.8410	0.0019
LFDI	− 0.0321	0.0011	− 0.0543	0.0270
LPDIF	− 0.0355	0.2585	− 0.1627	0.0463
OPEN	0.4736	0.0011	0.9680	0.0146
EDU	0.6835	0.0000	0.4246	0.0949
R²	0.9964		0.9996	
SSR	0.0168		0.0014	

V. CONCLUSION

Since the second half of the 20th century, the service sector has shown a rapid expansion trend, first in developed countries and then in developing countries. This process, supported by many socio-economic factors, brings with it some economic and social advantages and risks. Therefore, it is important to analyze the expansion dynamics of the service sector correctly so that the structural change to take place in a healthier and more controlled manner.

In this study, the effects of some factors on the development of the service sector in Türkiye over time were examined with modern time series analysis tools. Findings from FMOLS and DOLS methods reveal that income level represented by GDP per capita, openness ratio represented as the ratio of foreign trade volume to GDP, and education level contribute positively to the development of the service sector. On the other hand, foreign direct investment inflows and the increase in the productivity of the industrial sector have a negative impact on the growth in the service sector. The negative impact of FDI may be attributed to the detractive impact of multinational service investments which are mostly detrimental to domestic small and medium-sized firms. Considering that the total effect of positive factors is much higher than negative factors, it can be said that the growth in the service sector in Türkiye is predominantly fed by demand-side factors. In addition, considering that the level of education and openness can increase the level of entrepreneurship, it is possible that the increase in the human capital

and entrepreneurial skills will contribute to the development in the service sector.

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