Assessing The Economic Impact of Tourism: A General Equilibrium Analysis for Turkey

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Abstract

Turkey is a leading country in the world tourism market. Tourism sector has grown rapidly over the last three decades. It is generally argued that tourism sector creates opportunities for employment and contributes to economic growth and international tourism revenues compensate part of the current account deficit. Acknowledging these, the government recently published a strategy paper for tourism. In this study, we analyze the tourism strategy of Turkey using a multi-sector dynamic applied CGE model with two tourism sectors. We run policy simulations to assess alternative tourism strategies and the potential impacts of exogenous shocks. We found that any incentive to tourism will have a positive impact on the economy but increasing investments has the largest impact.

Keywords: Turkey, tourism, general equilibrium model, economic impact

1. Introduction

Tourism has become one of the world economy's most vibrant sectors, employing 9 percent of world's GDP in 2013 through its direct, indirect and induced impact (UNWTO, 2013). The number of international tourists soared from only 25 million in 1950 to 1035 million in 2012 and is expected to reach 1.8 billion by 2030 (UNWTO, 2013).

Turkey has emerged as a major destination in the rapidly growing international tourism market. The number of foreign tourist arrivals has in-

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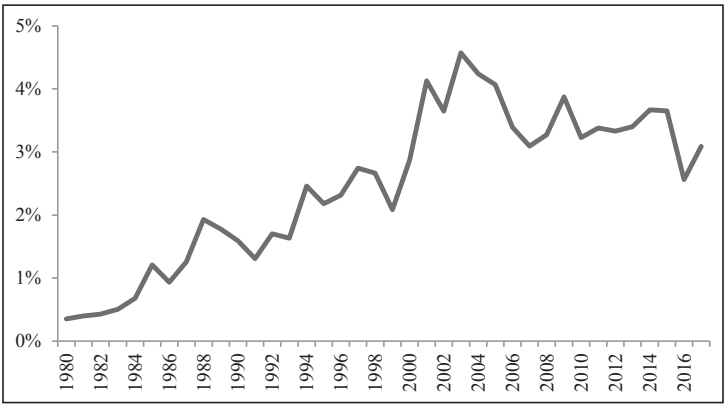
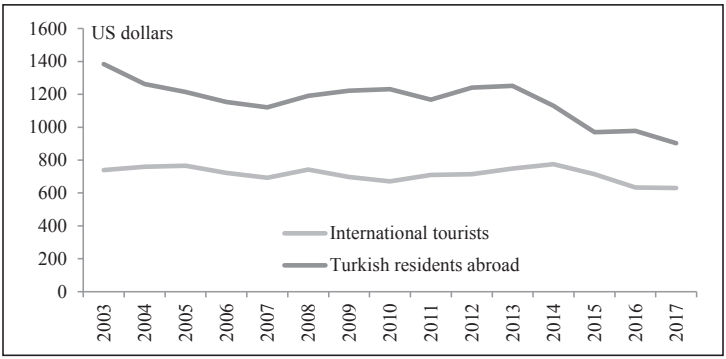
creased remarkably to 10 million in 2000 and 30 million in 2010. According to the World Tourism Organization (UNWTO) statistics, Turkey's share in international tourism revenues in 2013 was 2.5 percent. Both international and domestic tourism activities in Turkey have expanded rapidly during the last three decades. Figure 1 presents international tourism revenues as percentage of GDP. Following an increasing trend since the late 1990s, the ratio has remained above 3.5-4.0 percent after 2007. On the other hand, Figure 2 reveals that average expenditure per international tourists (including Turkish citizens residing abroad and visiting homeland) decreased slightly over the last decade, implying that the increase in revenues was mainly due to the increase in the number of tourists.

Figure 1. Tourism revenues as percentage of GDP in Turkey　(2003-2017)



Source: Turkstat, authors' calculations

Figure 2. Tourism receipts per tourist （2003-2013）



Source: Turkstat

Tourism receipts (domestic and international combined) reached a level as high as 5.1 percent of Turkey's GDP in 2013. Notwithstanding the lack of data on employment in the tourism sector, it is generally believed that the sector accounts for a considerable share of employment in Turkey. World Travel and Tourism Council (WTTC) estimates the share of travel and tourism sectors in total employment in Turkey in 2017 as 8.1 percent (WTTC, 2017). About 2 percentage points of this is due to direct employment and the rest due to indirect and induced employment. In addition, WTTC (2017) estimates the direct contribution of travel and tourism sectors to GDP in 2017 as 4 percent. UNWTO statistics ranked Turkey sixth in international tourist arrivals and 12th in international tourism receipts (UNWTO, 2013). Receipts from international tourism in 2014 reached 34.3 billion US dollars before declining to 26.2 billion dollars as a result of worsening security and political conditions such as a failed coup in 2016.

Economic policymakers often stress the importance of the international tourism sector as an important foreign exchange earner in Turkey contributing to finance the current account deficit, a chronic structural problem of

the Turkish economy. Table 1 shows that tourism has been a major contributor to services balance and has partially counterbalanced the deficit arising from the goods balance. Reflecting these views, Turkish government has recently announced ambitious tourism strategies and a quantitative evaluation of this strategy using a general equilibrium analysis is necessary. Recently, there is a surge in quantitative studies in tourism economics literature analyzing tourism policies using various techniques ranging from econometrics to general equilibrium analysis. While econometric models have a more focused and narrow perspective as they emphasize partial equilibrium aspects, input-output (I-O), social accounting matrix (SAM) and computable general equilibrium (CGE) models are broader in scope and take into account the relations across sectors and institutions in the economy. Econometric studies for Turkey (e.g., Gündüz and Hatemi-J 2005, Kaplan and Celik 2008, Katircioglu 2009, Zortuk 2009) generally find evidence for tourism-led growth hypothesis.

Table 1. Tourism revenues and the balance of payments in Turkey (2001-2017)

(Million US dollars)	2001	2003	2005	2007	2009	2011	2013	2015	2017
Current Account Balance	3760	−7554	−21449	−37781	−12124	−75082	−65061	−32109	−47436
Goods balance	−3363	−13489	−33080	−46852	−24850	−89137	−80016	−48128	−58955
Services balance	9136	10472	16016	13954	18625	20152	23124	24228	19940
Tourism	6352	11051	16087	15781	18405	20171	23180	25766	21146
Other services	2784	−579	−71	−1827	220	−19	−56	−1538	−1206
Income balance	−5000	−5557	−5839	−7108	−8308	−7855	−9349	−9651	−11135
Current transfers	2987	1020	1454	2225	2409	1758	1180	1442	2714

Note: The figures in the table are somewhat smaller than those reported by Turkstat. This is because the Central Bank treats revenues from transportation and communication sectors separately. Tourism's net balance may overweigh the services balance due to the presence of other services which exhibit net deficit.
Source: Central Bank of the Republic of Turkey, authors' calculations

Multi-sector input-output and CGE models are broader in their coverage, add nonlinearity to modeling, and incorporate interactions among activities, households, firms, government, and the rest of the world. I-O and SAM models (see Hara 2008) are constrained by various restrictions such as the assumption of excess capacity and they are demand-driven. For recent applications of I-O models in economic impact of tourism see Balaguer and Cantavella-Jorda (2002), Fayissa *et al.* (2008), and Oh (2005), and for recent applications of SAM modeling see Frechtling and Horvath (1999), West and Gamage (2001), Guo (2002), and Oosterhaven and Fan (2006). There is also a rich literature of CGE models examining tourism policies (e.g., Adams and Parmenter 1995, Zhou *et al.* 1997, Alavalapati and Adamowicz 2000, Blake 2000, Dwyer *et al.* 2000, Sugiyarto *et al.* 2003, Narayan 2004).

Despite the rich literature about other countries, there are only two SAM studies for Turkey (Akkemik 2012, Gül 2013) and no CGE analysis. Akkemik (2012) found that foreign tourists' expenditures have only limited impact on GDP and employment in Turkey. Gül (2013) found that an increase in foreign tourist expenditures stimulates relatively more output in refined oil, agriculture, and textiles sectors. This paper contributes to the literature on the analysis of tourism policies by analyzing the tourism strategy of Turkey using a multi-sector dynamic CGE model with a 20-year horizon. The model includes two tourism sectors, domestic and international. We run two policy simulations and measure potential impacts.

The remainder of the paper is organized as follows. Section 2 summarizes the recent tourism policies in Turkey since 1980. The structure of the CGE model is presented in Section 3. The following section describes the data. The results are presented and interpreted in the fifth section. Finally, section 6 concludes the paper.

２．An Overview of Recent Tourism Policies in Turkey

Tourism sector has recorded a remarkable development performance after the early 1980s. The development of the sector gained momentum after the enactment of the law encouraging tourism activities in 1982, which introduced various incentives such as provision of cheap land and tax exemptions. Thanks to growing demand from Europe and low costs, especially that of labor, the sector grew rapidly over the years. In the 2000s, the revenues from tourists from the Middle East increased largely.

Turkish government currently supports the tourism sector by various incentive schemes, including the provision of funds directly through the Small and Medium Enterprises Development Organization, investment incentives, financial support in the framework of the 1982 law on tourism incentives, tax exemptions, low-interest credits, special incentives to foreign investment, and financial support for participation in international tourism fairs. An extended discussion on tourism incentives can be found in MCT (2009) and Özgen (2013).

The government has set targets and projections for the tourism sector in the *Tenth Development Plan: 2014-2018*, prepared by the Ministry of Development (MD), and the strategy paper prepared by the Ministry of Culture and Tourism (MCT) titled *Tourism Strategy of Turkey: 2023*, the bible for the future of Turkey's tourism sector in the coming decade which set targets for the centenary of the country in 2023. The goals in the development plan are to "become a global brand through quality labor force, facility and services in the tourism sector, diversify and improve tourism products and services in order to attract higher income tourists, … increase the sectoral value added; and make tourism a key sector for regional development based on the principle of sustainability" (MD, 2013: 4). The plan forecasted an increase in international tourist arrivals to 48.3 million by

2018, implying an average annual growth rate of 4.6 percent for the period 2014-2018. The figure in 2017 was 32.4 million. Also, tourism receipts were expected to grow by 7.7 percent per annum and outbound expenditures by 9.9 percent. Public sector fixed investments in tourism amounted to 2.1 billion Liras for the period 2007-2013 and was expected to reach 0.6 percent of total public sector capital investments for the period 2014-2018 (MD, 2013). These projections were not, however, materialized due to worsening political conditions and the terrorist attacks of the ISIS during 2016-2017. Should international tourism strategy be implemented successfully, it was expected to benefit the economy by 86 billion US dollars in income. In 2023 tourist arrivals are expected to rise to 63 million and per-tourist expenditures to 1350 US dollars from about 800 US dollars in 2013 (MCT, 2007).

The main objective of the tourism strategy paper is stated as enhancing employment and contributing to economic development by achieving the status of one of the five largest tourism markets in the world in terms of international tourist arrivals and revenues by 2023. The strategy aims to achieve this objective by coordinated planning at regional and national levels, incentives to increase investments in tourism, and improvement of the quality in human and physical capital, and the development of global brands. Investments are given special importance in the strategy paper and the development plan. According to the Ministry of Development's official statistics, the share of tourism in total fixed investments increased from 2.2 percent in 1993 to 4.2 in 1999, and 6.1 in 2003. In 2010, it was 5.0 percent. The government plans to encourage investments by assisting small and medium-sized enterprises, making better use of EU pre-accession funds, renovating tourism facilities, and providing low-interest loans.

３．Method of Analysis

3.1. The Structure of the CGE Model

The model is based on the Arrow-Debreu general equilibrium setting where producers seek profit maximization in perfectly competitive markets, and are bound by constant returns to scale technologies. We assume that domestic goods and imports are imperfect substitutes. The model is based on the dynamic multi-sector CGE models in Dervi**ş** *et al*. (1982) and IFPRI (Lofgren *et al*., 2003). For brevity, we abstain from technical details of the model and describe the salient features. A list of equations is provided in the appendix.

Production, factors, and international trade: Output is modeled using a nested production function with two stages. At the lower stage, intermediate inputs are aggregated using a Leontief production function and production factors (capital and labor) are aggregated with constant-returns-to-scale Cobb-Douglas production function to produce value added. At the upper stage, value added and intermediate inputs are aggregated in fixed proportions (Leontief function) to produce output.

In international trade, we assume that Turkey is a “small country.” Imports and domestic goods are imperfect substitutes. Producers maximize output (domestic goods plus exports) using constant elasticity of transformation (CET) aggregation function. Likewise, consumers maximize utility via consumption of Armington composite good which is aggregated using a constant elasticity of substitution (CES) function of domestic goods and imports. We define the numeraire as a consumer price index calculated as the weighted sum of consumer prices.

Income, savings, and spending: Households and government are subject to budget constraints. Households own and receive income from factors and from the government and foreign transfers. They allocate income to con-

sumption, taxes, social security contributions, payments to the rest of the world, and savings. The government receives income from taxes and tariffs and allocates it to public consumption, subsidies, transfers, public savings, and payments to the rest of the world. Sectoral shares in private and public consumption are fixed.

Equilibrium Conditions: The model specifies three closure rules for equilibrium. First, total demand (spending by households and government, and firms' spending on investments and intermediate inputs) equals total supply in the goods and services markets. Second, in the factor markets, we assume perfect labor mobility with flexible wages in the labor market and capital immobility within periods and with flexible rental rate of capital. The distortion factors for wages and rental rate of capital by sectors are fixed. Third, current account equals saving-investment gap. This dictates that imports are financed by exports, foreign savings and net factor income from abroad. Foreign savings and net capital inflows are exogenous. Saving-investment equality is achieved via adjustments in investments.

Model Dynamics: The model is a recursive dynamic CGE model and dynamics across periods are ensured by the accumulation of factors and improvement in efficiency. Capital accumulation is achieved by adding investment to capital stock and subtracting depreciation. The depreciation rate is taken as 7 percent. We update labor by increasing total labor supply by 1.0 percent each period. We also allow for efficiency improvement in production by 0.5 percent annually by adjusting the shift factor in the production function. We set a 20-year horizon for the dynamic module with 2007 as the base year.

3.2. Policy Simulations

To analyze the impact of tourism policies of the Turkish government, we

look at the targets set forth in the strategy paper of the Ministry of Culture and Tourism and the 10th Development Plan of the Ministry of Development. The government expected tourism revenues to increase annually by 7.1 percent, tourism expenditures by 9.9 percent, and public sector fixed investments in tourism to reach 0.6 percent of total public investments. To meet the expected increase in demand, the government aims to stimulate higher levels of infrastructure investments in the tourism sector, e.g., public investment in roads and private investments in expansion of the facilities such as bed capacity.Based on these targets, we define two scenarios. In Simulation 1 (S1), we examine the consequences of an increase in total investments (public and private combined) in tourisms sectors annually by 10 percent. In simulation 2 (S2), we examine the impact of a fiscal incentive to the tourism sectors by reducing indirect taxes in these sectors by 50 percent.

４．Data and the Disaggregation of Tourism Sectors

The data are organized into a social accounting matrix (SAM) for 2007. We construct a SAM using GTAP database version 8. GTAP database does not have a tourism sector. Therefore, we add two tourism sectors as explained below. Table 2 lists the 23 sectors in the model.

Table 2. List of sectors

	Acronym	*Industry description*	*Sectoral codes in GTAP 8 Database*
1	AGR	Agriculture	1-14, 19-20
2	MIN	Mining	15-18
3	FOOD	Processed food products, beverages and tobacco	21-26
4	TEX	Textiles, wearing apparel, and leather products	27-29
5	WOOD	Wood products	30
6	PAPER	Paper products and publishing	31
7	OIL	Petroleum and coal products	32
8	CHEM	Chemicals, rubber, and plastic products	33
9	METAL	Ferrous metals and metal products	35-37
10	TRNEQ	Transport equipment, motor vehicles, and parts	38-39
11	ELEC	Electronic equipment	40
12	OTHMAN	Other manufacturing	42
13	MACH	Machinery and equipment	41
14	WATER	Water supply	45
15	ELEC	Electricity and gas supply	43-44
16	CONST	Construction	46
17	TRADE	Wholesale and retail trade (incl. hotel and restaurant services)	47
18	TRAN	Land transport, sea transport, and air transport	48-50
19	COMM	Communication services	51
20	FIN	Financial services and insurance	52-53
21	OTHSER	Other services	54-57
22	DOMTOUR	Domestic tourism	－
23	FORTOUR	International tourism	－

Our model includes two tourism sectors, international tourism and domestic tourism. Tourism data in a SAM are normally obtained from tourism satellite accounts. Since tourism satellite accounts are not available for Turkey, we obtain the data from other sources and estimate them where they are not available. To compute spending for international and domestic tourism, we follow the method in Akkemik (2012). International tourist expenditures by items are available only from tourism surveys conducted during 2001-2003 (SIS, 2005). Aggregate foreign tourist expenditures, on the other hand, are available from official statistics. We use sectoral spending by for-

eign tourists and update them to 2007 by assuming that the sectoral composition of expenditures in 2003 prevailed.

In the case of outbound tourism expenditures, a major problem is unavailability of disaggregated data while total outbound tourism expenditures are available from the official statistics. We allocate this aggregate figure to sectors by assuming that the composition of the outbound tourism expenditures is the same as that of the foreign tourists' expenditures.

Domestic tourism expenditures by domestic residents are available in *Household Domestic Tourism Statistics* published by Turkstat only for 2011 and 2012. We take the data for 2011 and readjust them to the base year (2007) by using the sectoral composition of spending and aggregate spending in domestic tourism in 2007. Most of these expenditures accrue to services sectors such as trade and transport services.

The model also requires additional information for employment. Although employment data for all economic sectors are available from official statistics, data on employment in tourism are not readily available. This is a major difficulty in tourism studies because labor employed in domestic and international tourism activities is included in the statistics of tourism-related services sectors such as hotels, restaurants, wholesale and retail trade, transport services, and so on. Following the ILO/UNWTO (2008) guidelines for calculation of employment in tourism, we use tourism-industry ratios to calculate the number of workers employed in tourism activities in tourism-related industries. Association of Turkish Travel Agencies reports the tourism-industry ratio as one half for restaurant and bar services, travel agencies, and auxiliary transport services, and also calculates the number of workers directly engaged in tourism activities in the transportation services sector (Akkemik, 2012).

5. Empirical Results

Simulation results are reported as percentage deviations from baseline solution. Long-run real GDP growth rate for the 20-year period in the baseline solution is 5.3 percent. Virtually all variables are on a positive growth trend in the baseline. Therefore, rather than focusing on levels, we report the deviations of the growth rates of the variables from the baseline growth path. A positive figure implies faster growth than the baseline.

We conducted a sensitivity analysis using an alternative set of values for CET and Armington substitution elasticities higher and lower by 15 percent. For brevity, we abstain from reporting the results here. The findings of the model are fairly robust to the choice of parameters. In addition, changing the depreciation rate does not lead to qualitatively different results. The results change only quantitatively as capital stock increases with a smaller depreciation rate and vice versa.

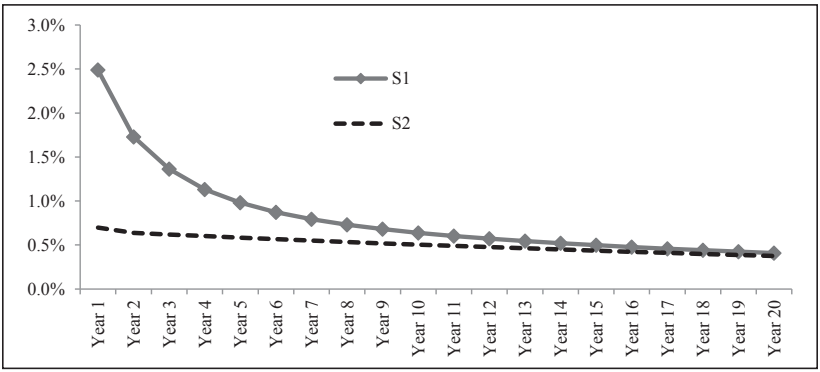
5.1. Macroeconomic Results

The results of the simulations show that S1, incentivizing tourism investments, has the largest impact. As shown in Table 3, annual increase in tourism investments by 10 percent leads to a bonus by 1.5 percentage points in Turkey's real GDP in the first five years and by 0.8 percentage points in 20 years. Figure 3 shows the additional economic growth for each scenario. At the beginning, the shocks increase real GDP growth rate largely but this effect flattens out over time. In S1 the immediate impact of an increase in tourism investments is to increase GDP growth rate by more than 2 percentage points. This effect is smoothed over time and drops to less than 1 percentage points after five years and changes marginally after ten years, remaining below 0.5 percentage points. The impact is smaller in S2.

Table 3. Macroeconomic results: deviation of the implied annual average growth rates of selected macroeconomic variables from the baseline growth trajectory (unit: %)

	S1				S2			
	Year 5	Year 10	Year 15	Year 20	Year 5	Year 10	Year 15	Year 20
Average wage rate	2.26	1.68	1.37	1.18	0.92	0.85	0.79	0.73
Rental rate of capital	−1.43	−1.12	−0.97	−0.87	−0.59	−0.57	−0.55	−0.53
Real GDP	1.55	1.15	0.95	0.82	0.63	0.58	0.54	0.51
Household income	2.32	1.69	1.37	1.17	0.93	0.86	0.79	0.72
Consumption	1.55	1.14	0.94	0.82	0.64	0.58	0.54	0.51
Investments	2.32	1.69	1.37	1.17	0.93	0.86	0.79	0.72
Government revenues	2.32	1.69	1.38	1.18	0.92	0.85	0.79	0.72
Government expenditures	2.31	1.70	1.38	1.18	0.91	0.85	0.79	0.73
Sales taxes	2.21	1.66	1.36	1.17	0.86	0.82	0.77	0.71

Figure 3. Contribution to real GDP growth rate: deviation of the growth rate from the baseline growth path



The increase in the long-run economic growth rate in both scenarios lead to an increase in the demand for labor, which, given the setup of our model, pushes wages up to reset equilibrium in labor markets. A rise in the average wage rates is seen in both scenarios (Table 3). The increase in the growth rate of wages is especially high in S1. The rental rate of capital decreases relative to the baseline in all scenarios to clear capital markets. This is because sectoral capital stocks increase largely, as discussed in the forth-

coming section.

Households' disposable income grows faster by 2.3 percentage points in the first five-year period and by 1.2 percentage points after 20 years in S1. The respective figures in S2 are 0.95 for the first five years and 0.7 after 20 years. Private investments and consumption grow faster by 0.9 and 0.6 percentage points, respectively, during the first five years and by about 0.7 and 0.5 percentage points, respectively, after 20 years in S1. Since taxes distort market prices, tax reduction in S2 may seem desirable for a competitive market. However, the model's macroeconomic results in Table 3 suggest that incentivizing investments lead to larger increases in government revenues compared to reduction in tax rates. This is because economic growth rate is higher in the former.

5.2. Sectoral Results

The results for the simulations by sectors are qualitatively similar but quantitatively much larger for S1 compared to S2. We first examine the structural changes because they are informative of the changes in resource allocation. Deviations of factor demands from the baseline growth trajectories in Table 4 indicate a shift of labor from manufacturing to services. Increase in tourism investments in S1 leads to a decrease in labor demand especially in textiles, clothing, chemicals, metals, and machine manufacturing to varying degrees. The reverse is observed in services. Demand for labor in domestic and foreign tourism sectors grows faster in the first five-years by 1.21 and 1.06 percentage points, respectively, in S1. Labor demand in construction, trade, transport and financial services grows significantly faster, and only slightly fast in tourism sectors. In the sectors experiencing a decrease in the demand for labor, wages are increasing. The findings for wages by sectors are not reported in Table 4. However, since wage distortion factors are

constant, it is sufficient to look at the average wage rate.

Table 4. Demand for labor and capital by sectors: deviation of the implied annual average growth rates from the baseline growth trajectory (unit: %)

	S1			S2			S1			S2		
	Demand for labor						Demand for capital					
	Year 5	Year 10	Year 20	Year 5	Year 10	Year 20	Year 5	Year 10	Year 20	Year 5	Year 10	Year 20
AGRIC	−0.56	−0.41	−0.28	−0.24	−0.22	−0.18	3.16	2.41	1.77	1.27	1.21	1.09
MINING	0.89	0.04	−0.20	0.38	0.03	−0.12	4.66	2.87	1.85	1.90	1.46	1.15
FOODMNF	−0.31	−0.23	−0.16	−0.13	−0.12	−0.10	3.42	2.59	1.90	1.38	1.31	1.17
TEXTILE	−0.78	−0.42	−0.23	−0.34	−0.23	−0.15	2.93	2.39	1.82	1.16	1.20	1.11
WOOD	−0.28	−0.16	−0.09	−0.14	−0.09	−0.06	3.45	2.67	1.97	1.37	1.34	1.21
PAPER	−0.31	−0.19	−0.12	−0.14	−0.11	−0.08	3.42	2.63	1.94	1.37	1.32	1.19
REFOIL	0.04	−0.21	−0.27	0.02	−0.11	−0.16	3.78	2.61	1.79	1.53	1.32	1.10
CHEMICAL	−1.11	−0.66	−0.38	−0.47	−0.35	−0.25	2.59	2.14	1.67	1.03	1.07	1.02
METAL	−0.84	−0.52	−0.31	−0.36	−0.28	−0.20	2.87	2.29	1.74	1.14	1.15	1.06
TRNSPEQP	−0.61	−0.32	−0.17	−0.27	−0.18	−0.11	3.10	2.50	1.88	1.23	1.25	1.15
ELECMNF	−1.36	−0.72	−0.39	−0.59	−0.39	−0.25	2.32	2.08	1.66	0.91	1.04	1.01
OTHERMN	−0.31	−0.21	−0.14	−0.14	−0.12	−0.09	3.41	2.61	1.92	1.36	1.31	1.18
MACHEQP	−0.55	−0.30	−0.17	−0.24	−0.16	−0.11	3.17	2.52	1.88	1.26	1.26	1.15
WATER	−0.17	−0.13	−0.11	−0.10	−0.08	−0.07	3.56	2.69	1.95	1.41	1.35	1.20
ELECTRI	−0.46	−0.37	−0.29	−0.20	−0.20	−0.18	3.26	2.44	1.76	1.30	1.23	1.08
CONSTRU	0.38	0.25	0.16	0.14	0.12	0.10	4.13	3.08	2.22	1.66	1.56	1.37
TRADE	0.14	0.10	0.06	0.05	0.05	0.04	3.88	2.93	2.12	1.56	1.48	1.31
TRANSP	0.07	0.05	0.04	0.02	0.02	0.02	3.81	2.88	2.10	1.53	1.45	1.29
COMMUNI	−0.42	−0.33	−0.25	−0.19	−0.17	−0.16	3.30	2.49	1.81	1.32	1.25	1.11
FINANCE	0.16	0.12	0.08	0.06	0.05	0.05	3.91	2.95	2.14	1.57	1.48	1.31
OTHERSE	0.05	0.02	0.01	0.01	0.01	0.00	3.79	2.85	2.07	1.52	1.44	1.27
DOMTOUR	0.24	0.14	0.08	0.15	0.10	0.06	3.99	2.97	2.14	1.66	1.53	1.33
FORTOUR	0.21	0.12	0.07	0.07	0.06	0.04	3.96	2.95	2.13	1.58	1.49	1.31

Sectoral demands for capital grow faster in both scenarios. The increase is large especially in domestic services, reflecting the large increase in the growth rate of output. Domestic and foreign tourism sectors' demand for capital goes up faster by 2.1 to 4.0 percentage points in S1, and this figure is higher than other services except construction. Domestic trade, transport, communications, and financial services follow. Capital demand also in-

creases but relatively slowly in manufacturing sectors, textile, clothing, chemicals, metals, and machines, in particular. In conjunction with the increase in the demand for capital, the real rental rate of capital declines in all sectors. Due to diminishing marginal returns to capital, the decline is larger in the sectors where demand is higher.

In Table 5 we report the change in value-added and household consumption by sectors. The figures for value-added imply sectoral contributions to GDP in the long-run. Services, construction and tourism in particular, contribute largely to GDP growth. They are followed by transport equipment, machinery, wood and cork products, and financial services. Consumption growth rate increases in the long-run. This creates inflationary pressure, more strongly in S1. Inflation rate rises by 0.7 percentage points in S1 during the first five years, and the long-run impact on inflation is an additional 0.34 percentage points after 20 years. The respective figure in S2 is an additional annual inflation about 0.3 percentage points during the first five years and 0.2 percentage points after 20 years. Consumption of tourism services grow faster by 1.33 percentage points in the first five years in S1. Related figure is 0.68 percentage points in S2. Notably, while there is a similar impact on consumption of services in both tourism sectors in S1, the rise in consumption of domestic tourism is larger than foreign tourism in S2.

Table 5. Change in the growth rates: deviation of the implied annual average growth rates from the baseline growth trajectory (unit: %)

	S1			S2			S1			S2		
	Value-added						Household consumption					
	Year 5	Year 10	Year 20	Year 5	Year 10	Year 20	Year 5	Year 10	Year 20	Year 5	Year 10	Year 20
AGRIC	0.16	0.09	0.02	0.07	0.05	0.02	2.02	1.49	1.06	0.81	0.75	0.65
MINING	−0.73	−0.59	−0.48	−0.30	−0.30	−0.29	2.72	1.86	1.26	1.10	0.95	0.78
FOODMNF	0.45	0.31	0.18	0.18	0.16	0.12	1.81	1.34	0.96	0.73	0.68	0.59
TEXTILE	0.93	0.68	0.45	0.38	0.35	0.28	1.87	1.41	1.00	0.75	0.71	0.62
WOOD	1.06	0.77	0.52	0.43	0.40	0.32	1.56	1.18	0.85	0.63	0.59	0.52
PAPER	0.91	0.66	0.44	0.37	0.34	0.27	1.64	1.22	0.88	0.66	0.62	0.54
REFOIL	−0.29	−0.25	−0.23	−0.12	−0.13	−0.14	2.75	1.86	1.23	1.12	0.95	0.77
CHEMICAL	0.67	0.48	0.30	0.27	0.24	0.19	1.94	1.45	1.03	0.78	0.73	0.63
METAL	0.88	0.64	0.42	0.36	0.33	0.26	1.90	1.41	1.00	0.77	0.71	0.62
TRNSPEQP	1.14	0.83	0.56	0.46	0.43	0.35	1.93	1.45	1.02	0.77	0.73	0.63
ELECMNF	0.68	0.49	0.31	0.28	0.25	0.19	1.91	1.45	1.04	0.77	0.73	0.64
OTHERMN	0.73	0.52	0.33	0.30	0.27	0.21	1.71	1.27	0.91	0.69	0.64	0.56
MACHEQP	1.13	0.83	0.56	0.46	0.42	0.35	1.85	1.40	0.99	0.74	0.71	0.61
WATER	0.43	0.30	0.17	0.18	0.15	0.11	1.76	1.29	0.92	0.71	0.65	0.56
ELECTRI	−0.10	−0.11	−0.13	−0.04	−0.05	−0.08	2.17	1.55	1.08	0.88	0.79	0.67
CONSTRU	1.17	0.86	0.58	0.48	0.44	0.36	1.40	1.02	0.72	0.56	0.51	0.44
TRADE	0.94	0.68	0.45	0.38	0.35	0.28	1.47	1.08	0.77	0.59	0.55	0.47
TRANSP	0.89	0.65	0.42	0.36	0.33	0.27	1.61	1.17	0.83	0.65	0.59	0.51
COMMUNI	0.18	0.11	0.03	0.07	0.06	0.02	1.90	1.39	0.99	0.76	0.70	0.61
FINANCE	1.01	0.74	0.49	0.41	0.38	0.31	1.41	1.04	0.74	0.56	0.52	0.46
OTHERSE	0.81	0.58	0.38	0.33	0.30	0.24	1.54	1.13	0.81	0.62	0.57	0.50
DOMTOUR	1.16	0.85	0.57	0.47	0.43	0.36	1.33	0.96	0.68	0.60	0.52	0.43
FORTOUR	1.15	0.84	0.57	0.47	0.43	0.35	1.33	–	–	–	–	–

Output increases faster in all scenarios. In the first five years, output in domestic and foreign tourism sectors grow faster by 1.3 percentage points in S1, and 0.5-0.6 points in S2. The relevant figures for the 20-year horizon are 0.7 and 0.4 points, respectively. Output growth in all other sectors is affected positively, particularly in mining, oil, coal, water, electricity, and domestic services such as construction, trade, transport, communication, and finance (see Table 5). This is in line with our expectations, given that a positive shock on tourism is transferred to energy and tourism-related ser-

vices via linkages.

Finally, the change in export demand is important from a policy standpoint. If the change in export composition after the policy experiments still favors traditional export industries, this may impede structural changes and resource allocation. The results in Table 6 show that the growth rates of exports increase compared to the base scenario most notably in mining, refined oil products, agriculture, and food manufactures. On the other hand, the growth rates of the exports of chemicals, metals, transport equipment, electrical machines, and other machinery and equipment sectors decrease compared to the base scenario. These sectors are important export industries with strong potential for technological progress and foreign exchange earnings. Therefore, the results reveal an important anomaly where export growth favors traditional industries. In addition, the growth rates of imports are higher than the baseline in all sectors. These findings reveal that current account deficit will widen and import dependency will persist.

Table 6. Export and imports by sectors: deviation of the implied annual average growth rates from the baseline growth trajectory (unit: %)

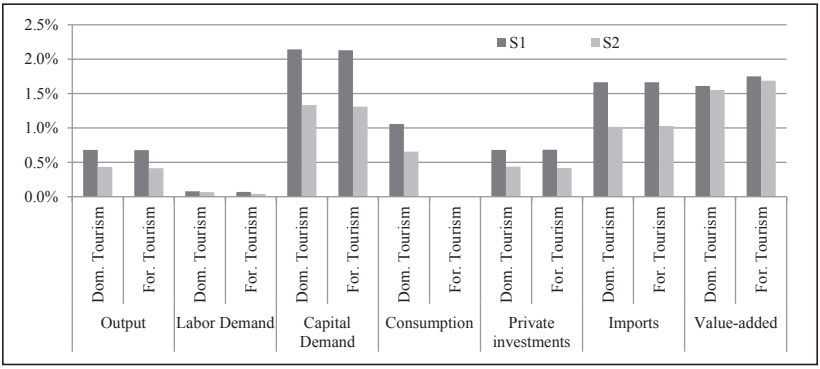
	S1			S2			S1			S2		
	Exports						Imports					
	Year 5	Year 10	Year 20	Year 5	Year 10	Year 20	Year 5	Year 10	Year 20	Year 5	Year 10	Year 20
AGRIC	0.88	0.72	0.62	0.35	0.36	0.37	2.26	1.67	1.15	0.91	0.85	0.71
MINING	4.16	2.40	1.49	1.71	1.23	0.93	1.71	1.36	0.98	0.67	0.68	0.60
FOODMNF	0.48	0.42	0.39	0.19	0.21	0.23	2.67	1.94	1.32	1.07	0.98	0.82
TEXTILE	−0.76	−0.35	−0.11	−0.34	−0.20	−0.08	2.33	1.73	1.21	0.93	0.87	0.74
WOOD	−0.68	−0.41	−0.20	−0.30	−0.22	−0.14	2.84	2.05	1.40	1.14	1.04	0.87
PAPER	−0.48	−0.27	−0.09	−0.21	−0.15	−0.07	2.74	2.00	1.37	1.09	1.01	0.85
REFOIL	3.18	1.92	1.22	1.30	0.98	0.76	1.21	1.18	0.92	0.46	0.58	0.56
CHEMICAL	−0.60	−0.24	0.00	−0.27	−0.14	−0.02	2.13	1.60	1.13	0.85	0.81	0.69
METAL	−0.69	−0.38	−0.15	−0.30	−0.21	−0.10	2.06	1.56	1.10	0.82	0.79	0.68
TRNSPEQP	−0.87	−0.47	−0.22	−0.38	−0.25	−0.15	2.40	1.76	1.22	0.96	0.89	0.75
ELECMNF	−0.94	−0.31	−0.02	−0.42	−0.18	−0.03	2.08	1.59	1.12	0.83	0.80	0.69
OTHERMN	−0.04	0.04	0.12	−0.03	0.01	0.06	2.74	1.98	1.35	1.10	1.00	0.83

MACHEQP	−1.00	−0.60	−0.33	−0.43	−0.32	−0.21	2.69	1.93	1.32	1.08	0.98	0.82
WATER	0.54	0.44	0.39	0.19	0.21	0.23	2.77	2.05	1.41	1.09	1.03	0.87
ELECTRI	1.60	1.13	0.83	0.64	0.57	0.51	2.20	1.70	1.20	0.87	0.86	0.74
CONSTRU	−0.35	−0.27	−0.15	−0.15	−0.14	−0.10	3.31	2.42	1.67	1.33	1.23	1.03
TRADE	−0.22	−0.13	−0.01	−0.10	−0.07	−0.02	3.18	2.33	1.60	1.28	1.18	0.99
TRANSP	0.00	0.01	0.07	0.00	0.00	0.04	3.06	2.26	1.55	1.23	1.15	0.96
COMMUNI	0.81	0.65	0.54	0.32	0.32	0.32	2.54	1.86	1.27	1.01	0.94	0.79
FINANCE	−0.47	−0.31	−0.14	−0.20	−0.17	−0.10	3.35	2.45	1.68	1.35	1.24	1.04
OTHERSE	−0.06	0.00	0.08	−0.03	−0.01	0.04	3.10	2.26	1.54	1.25	1.15	0.96
DOMTOUR	−0.63	−0.48	−0.29	−0.09	−0.16	−0.14	3.32	2.43	1.66	1.28	1.20	1.02
FORTOUR	−0.67	−0.50	−0.30	−0.28	−0.27	−0.20	3.32	2.43	1.67	1.33	1.23	1.03

5.3. The Results for Tourism Sectors

The results for tourism sectors only are presented in Figure 4. As with other sectors, increase in tourism investments (S1) has the largest impact on tourism sectors. The impact on the growth of output in domestic tourism is slightly larger than that of foreign tourism for most variables.

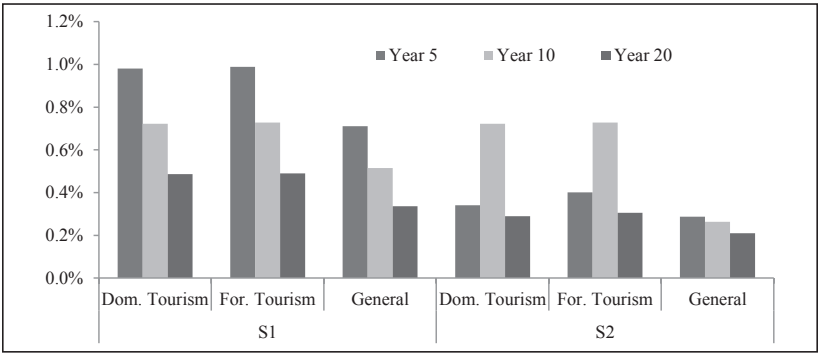
Figure 4. Selected results for tourism sectors: deviation of growth rates from baseline growth trajectory



Output in tourism sectors grows faster by 0.4-0.7 percentage points. The growth rate in the demand for capital in tourism sectors is significantly larger compared to labor demand. Capital demand grows faster than the baseline by 1.3-2.1 percentage points while labor demand grows faster by only 0.4-0.8 points. It follows that wage rates do not increase much but real rental rate of capital declines much faster. Following the increase in the demand for factors, value added growth rate increases in both tourism sectors. Private investments and consumption grow faster than the baseline as well. Accordingly, higher demand puts upward pressure on inflation. The impact on imports is considerably higher in S1 compared to S2.

We are also interested in competitiveness of the tourism sectors. For this purpose, we trace the changes in supply prices and compare them with the general price level in Figure 5. Supply prices grow faster in S1, particularly adding 1.0 percentage point in the first five years. The rise in the growth rate of tourism prices is higher than the general price level, implying worsening price competitiveness, another adverse effect to be considered in policymaking.

Figure 5. Deviation of the growth rates of the domestic prices and the general price level from the baseline growth trajectory (unit: %)



６．Conclusion

Tourism has emerged as important service sector in Turkey. In this paper, we assess the tourism policies of Turkey with reference to the government's official tourism strategy using a CGE model. We found that increasing investments has a larger impact than reducing taxes. Yet, considerations about inflationary pressure and current account deficit remain. Inducing tourism sectors has larger impact on tourism-related sectors, mostly services, compared to other sectors. Domestic tourism seems to have stronger linkages compared to foreign tourism.

The model has certain limitations with regards to data availability for tourism sectors. When tourism satellite accounts and employment statistics for tourisms sectors become available, they can be incorporated into CGE analysis. In addition, we did not analyze some economic issues such as poverty, income distribution, and so on. Impact of scenarios on different categories of households is an interesting subject and requires disaggregation of the types of households and labor in detail.

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Appendix: List of Equations and Glossary

Production

$$X_i = \min(\frac{X_{ji}}{a_{ji}})$$

$$V_i = \alpha_i^V \sum_f \left(F_i^f\right)^{\gamma_i^V}$$

$$w_i^f = \frac{\gamma_i^V V_i}{F_i^f}$$

$$w_i^L \tau_i^L F_i^L = (1-\gamma_i^V) p_i^V Q_i$$

$$w_i^K \tau_i^K F_i^K = \gamma_i^V p_i^V Q_i$$

Prices

$$p_i^Z Z_i = (p_i^M M_i + p_i^D D_i)(1 + t_i^C)$$

$$p_i^Q Q_i = p_i^E E_i + p_i^D D_i$$

$$P = \sum_i \beta_i p_i^C$$

$$p_i^V = \left(1 - t_i^{IND}\right) p_i^Q - \sum_j a_{ji} p_j^Z$$

$$p_i^X = \sum_j a_{ji} p_i^C$$

$$p_i^Q = p_i^X + p_i^V$$

$$p_i^M = p_i^{M*}(1 + t_i^M) R$$

$$p_i^E = p_i^{E*} R$$

Trade

$$Z_i = \alpha_i^Z \left(\gamma_i^Z D_i^{-\rho_i^Z} + (1-\gamma_i^Z) M_i^{-\rho_i^Z}\right)^{-\frac{1}{\rho_i^Z}}$$

$$Q_i = \alpha_i^T \left(\gamma_i^T E_i^{-\rho_i^T} + (1-\gamma_i^T) D_i^{-\rho_i^T}\right)^{-\frac{1}{\rho_i^T}}$$

$$\frac{M_i}{D_i} = \left(\frac{\gamma_i^Z}{1-\gamma_i^Z} \cdot \frac{p_i^D}{p_i^M}\right)^{\frac{1}{1+\rho_i^Z}}$$

$$\frac{E_i}{D_i} = \left(\frac{\gamma_i^T}{1-\gamma_i^T} \cdot \frac{p_i^E}{p_i^D}\right)^{\frac{1}{\rho_i^T - 1}}$$

Demand, spending, savings, and investments

$$CCA = \sum_i w_i^K K_i d$$

$$p_i^C C_i = \beta_i (1 - mps)(1 - t_H) Y_H$$

$$X_i = \sum_j a_{ji} Q_j$$

$$Y_H = \sum_i w_i^L L_i + TRN_H$$

$$S_H = mps(1 - t_H) Y_H$$

$$Y_G = \sum_i t_i^{IND} p_i^Q Q_i + \sum_i t_i^C (p_i^M M_i + p_i^D D_i) + \sum_i p_i^{M*} (1 + t_i^M) M_i R + \sum_i t_i^K w_i^K K_i + t_H Y_H$$

$$S_G = Y_G - G - TRN_G$$

$$p_i^C G_i = gs_i G$$

$$GDP = \sum_i p_i^C (C_i + G_i + I_i + p_i^E E_i - p_i^M M_i)$$

$$G = gys \cdot GDP$$

$$TRN_G = gts \cdot GDP$$

$$p_i^C I_i = is_i ID$$

Equilibrium Conditions

$$Z_i = C_i + G_i + I_i + X_i$$

$$F^f = \sum_i F_i^f \qquad \text{(i.e., } L = \sum_i L_i,\ K = \sum_i K_i\text{)}$$

$$S_G + S_H + S_F R = ID + CCA$$

$$\sum_i p_i^E E_i + NFI + S_F = \sum_i p_i^M M_i$$

Model Dynamics

$$K_{i,t+1} = K_{i,t}(1 - d) + I_{i,t}$$

$$L_{t+1} = (1 + g) L_t$$

Glossary

Indices		gys	ratio of government expenditures to GDP
i, j	sectors	is_i	sectoral shares of investment demand
f	primary factors, (K: capital, L: labor),	mps	marginal propensity to save
t	time	t_i^C	tax rate on consumption
Parameters and Exogenous Variables		t_i^{IND}	indirect tax rate on production
a_{ji}	input-output coefficients	t_i^K	direct tax rate on capital income
d	depreciation rate	t_i^M	import tariff rate
g	population growth rate	α_i^T	shift parameter for CET function
gs_i	sectoral shares of government consumption	α_i^V	shift factor for Cobb-Douglas function
gts	ratio of net government transfers to GDP	α_i^Z	shift parameter for Armington function

β_i	weights in the consumer price index
γ_i^T	share parameter for CET function
γ_i^V	share factor for Cobb-Douglas function
γ_i^Z	share parameter for Armington function
ρ_i^Z	elasticity parameter for Armington function
ρ_i^T	elasticity parameter for CET function
τ_i^K	distortion factor for rental rate of capital
τ_i^L	wage distortion factor

Endogenous Variables

C_i	spending by households
CCA	capital consumption allowance
D_i	domestic good supply
E_i	exports
F^f	total factor endowment
F_i^f	demand by firms for primary factor of type *f*
G	total government expenditures
G_i	government expenditures
GDP	gross domestic product
I_i	investment spending
ID	total investment demand of firms
K	total capital endowment
K_i	capital stock by sectors
L	total labor endowment
L_i	labor demand
M_i	imports by sectors
NFI	net factor income
P	consumer price index
p_i^C	consumer prices
p_i^D	prices of domestically supplied goods
p_i^E	prices of exports
p_i^{E*}	world prices of imported goods
p_i^M	prices of imports
p_i^{M*}	world prices of exported goods
p_i^Q	prices of output
p_i^X	prices of intermediate input
p_i^V	prices of value-added
p_i^Z	prices of Armington composite good
Q_i	gross output
R	exchange rate
S_F	foreign savings in dollars
S_G	public savings
S_H	household savings
t_H	income tax rate
TRN_G	net government transfers
TRN_H	net transfers to households
V	value-added
w_i^f	return to factor of type *f*
w_i^K	rental rate of capital
w_i^L	price of labor (wage)
X_i	aggregate intermediate input demand
x_{ji}	purchase of intermediate inputs
Y_G	government income
Y_H	household income
Z_i	Armington composite good supply