The Effects of Foreign Demand Increase on Tourism Industry in Turkey: a CGE Approach

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Abstract

Tourism has become one of the major industries of Turkey in terms of foreign exchange earnings. Over the last three decades tourism industry has grown considerably and income is over 20 billion dollars in 2010. The expansion of tourism generates more income in the economy and it contributes to other industries. In this paper, the aim is to analyze the economic effects of a 10 % increase in foreign demand for tourism industry by using a computable general equilibrium model of Turkey which is based on social accounting matrix in year 2002. Tourism sector is specified by using tourism satellite accounts and composed as a separate sector in the input output matrix. Simulation results suggest that the effects of a ten percent increase in foreign tourism demand would be to increase welfare by 0.03% of GDP. It is also found that an increase of foreign demand will lead to increase employment by 0.2%, but at the same time it puts pressure on domestic prices, increased by 0.53%. In addition, household income increases by 3.6%. There are also small increases in real private consumption and investment expenditures.

Keywords: tourism industry, social accounting matrix, tourism satellite accounts, computable general equilibrium model

JEL classification: C68, D58, O52

1. INTRODUCTION

Turkey has started to be interested in tourism and utilize its economic benefits after 1950s (Goymen, 2000). However, especially after 1980s, tourism contributed to Turkish economy significantly. Before 1980 tourism is defined "development" period and after 1980s "advance" period for the Turkish economy (Egeli, 1997). Tourism Incentive Law was effectuated in 1982 and it gave opportunity to increase tourism investments. According to World Tourism Organization (UNWTO), 925 million tourists travel all around the world in 2010 and tourism receipts was amount of 880 billion dollars. At the same year, Turkey was visited by 28.6 million tourists and compared to 10 years ago, number of tourists increases threefold. In 2010, Turkey became 8th country of world according to tourist arrivals. Similarly, Turkey earned 20,8 billion dollars in 2010 and became 9th country of world according to tourism income (UNWTO, 2011). Showing the importance of these values, it is useful to look the ratios of tourism income in Gross Domestic Product (GDP) and exports at Table 1. According to this table, GDP of Turkey and value of exports in 2009 are 616 and 102 billion dollars respectively. The shares of tourism income in these values are %3.4 and %20.7 in 2009.

Table 1

Computable General Equilibrium (CGE) Modelling is an approach to economic analysis that combines a general equilibrium setting (all markets clearing simultaneously) with numerical simulation (Blake, 2000:1). Input-Output Tables and Social Account Matrices shows the relationships among different sectors and industries, so that they clarify the structure of Computable General Equilibrium modelling (Dwyer *et al*.,2000). They are used as primary data source for building CGE modelling. CGE modelling has been described as a paradigm shift from I-O modelling in tourism economic impact studies because CGE modelling has more realistic assumptions and can generate more reliable results than I-O modelling (Dwyer *et al.,*2004a). Input-output (I-O) tables and Social Accounting Matrices (SAMs) clarify the structure of CGE modelling because they reveal the interdependent relationships among different industries and sectors (Dwyer *et al*., 2000).

Estimation of the economic impact of tourism by using CGE modelling involves some steps. The first step is data collection and processing data accordance with model. Data processing is required for data updating and aggregating or disaggregating. CGE models are built on I-O tables or Social Accounting Matrices (SAMs), hence second step is building a CGE model based on some assumptions and model closure rules. Third step is employing simulations which are needed to be according to research objectives. Final step is the model findings are analysed and commenting results to evaluate tourism policies.

In literature, there are many studies on the economic aspect of tourism using CGE modelling These studies examine a wide range of tourism issues such as an increase or decrease on tourism income (Narayan, 2004), the impact of change in tourism demand (Adams and Parmenter, 1995; Zhou *et al*., 1997), shocks and tourism crises on tourism industry (Blake et al.2001; Blake *et al*.2003b,c ; Dwyer *et al*.2003; Yang and Chen, 2009), tourism taxation (Blake, 2000; Gooroochurn and Sinclair, 2005;Gooroochurn and Milner, 2005),economic growth (Kweka et al.,2003) environment,globalization (Alavalapati *et al*.,2000; Sugiyarto *et al*.,2003), environment and climate change (Berrittella et al., 2006), productivity (Blake et al.,2006) and poverty (Blake et al., 2008).

The impacts of tourism means is a gross concept, which indicates how GDP and other macroeconomic variables will change when tourism demand or expenditure changes (Dwyer et al., 2002). Some studies have used I-O modelling and CGE modelling to quantify the economic impact of tourism. However, I-O modelling generates higher economic effects than CGE modelling (Dwyer et al., 2004b and Zhou et al., 1997). There are some differences between CGE models and I-O models. For example, I-O models assume that there are no constraints on factors which in fact are limited in the economy; CGE models assume equilibrium in factor markets (Blake and Sinclair, 2003b). While I-O models assume that wages and prices are unchanged, CGE models allow wages and prices to change (Dwyer et al., 2000).

Simulations of CGE models are set according to the objective of a study. In terms of change in tourism demand and tourism policies, some studies are found which similar with this study. Several studies are to introduce a certain percentage decrease or increase in tourism expenditures or in the number of tourists and shock the model. Zhou et al.(1997) assumed that there is a 10 % decrease in tourism spending in Hawaii. Adams and Parmenter (1995) designed a scenario that there is an extra 10 % growth in the number of tourist arrivals every year. In Blake (2000), a simulation of a 10 % increase in foreign tourism is assumed.

This paper investigates a computable general equilibrium (CGE) model of Turkey which built for examining the effects of foreign demand increase of tourism on the Turkish economy. Model is a single-country static model and is built by Turkish input-output (IO) table. This table is set by Turkish Statistics Institution in 2002 and includes 59 sectors. After some concordances, sectors are aggregated to 18 sectors. Tourism is not specific sectors itself, so that by using Tourism Satellite Accounts (TSAs), we employ 19th sector as tourism. Based on this 19 sectors input-output table, we compose a Social Accounting Matrix (SAM) including tourism. SAM table includes industry costs (intermediate costs, factor costs) total supply and demand by good (intermediate and final demand) and for domestic and foreign (import and export) markets. After that, model is become ready to run as CGE model.

At second part, we demonstrate the CGE model of Turkey which focuses on tourism sector is expressed algebraically. This model is formed by 19 sectors, 2 production factors (labor and capital) and 1 representative household. Algebraic equations include both behavioral equations of economic decision units and macroeconomic equilibrium identities which are developed based on model's closure rules. Model is set with a framework of neoclassical perspective and simultaneously introduces market clearing conditions under the profit and utility maximization and it helps to detect price setting which provides to equate supply and demand. This model is solved by GAMS[1] software by using MPSGE[2] language (Rutherford, 1994). This

[1] Generalised Algebraic Modelling System.
[2] Mathematical Programming System for General Equilibrium.

model attempts to endogenous tourism sector in Turkey. Third part suggests model closure rules, and fourth part shows elasticity values which used in the model. Final part concludes the model results.

2. MODEL

Model is a single-country static model and it aims to analyze the demand increase of tourism sector for Turkey. It employs some assumptions such as perfect competition, perfect factor mobility, constant returns to scale and market clearing conditions. Perfect competition and constant returns to scale of technology are being for the all sectors and markets. Production factors are mobile between sectors. All goods, service and factor markets are cleared simultaneously. The model is calibrated to replicate benchmark equilibrium in 2002. The Harberger[3] convention is used so that the model is calibrated so that all prices are equal to one in the benchmark.

Production and consumption behaviours are modelled by employing Constant Elasticity of Substitution (CES), Leontief, Cobb-Douglas, Linear Expenditure System (LES) and Constant Elasticity of Transformation functions. Aggregate value added is defined as a CES function of labour and capital. Cross-border trade is based on standard two assumptions: First, Turkey is assessed as a small country which does not have power to affect export and import prices and accepts world prices as given. Second, goods are differentiated according to regions. The last assumption is known as Armington (Armington,1969) and it defines domestic products differ from imported goods as qualitatively.

Household receives income from different sources such as income from production factors transfers from government and income flows from abroad and spends them either on consumption goods and services or saves. Public sector receives income from taxes which are levied on goods, consumption, foreign trade and income. These government incomes are employed fully on public consumption and payments to households.

2.1 Economic Agents and Behavioral Equations

2.1.1 Producer Behavior

In model, production process is defined as based on two-level constant elasticity of substitution production function. Each producer aims to maximize difference between its income and the cost of factors which used in production. Factors demands are derived from first-order conditions by using profit maximization approach. Production Q_i consists of value added, VA_i (at market prices) and intermediate demands

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[3] The Harberger convention is defined that the model is calibrated so that all prices are equal to one in the benchmark.

for each goods $QA_{j,i}$. Value added at market prices is taxed with a t ratio and rest part of value added F_i shows a value added at factor prices.

These value added are defined according to CES function between production factors (labor and capital) with substitution elasticity σ_i for each sector. For each i sector, QV_i amount of total value added is produced at price of PV_i. For this produced value added QKi and QLi amount of capital and labor inputs are used and for these inputs, r unit rant and w unit wage are paid respectively.

Equation (1) shows CES function of total value added of total inputs at factor prices (QF_i), and equation (2) provides to equate income from value added and expenditures on factors.

$$QF_i = \mathrm{B}_i \left[\beta_i QL_i^{\left(\frac{\sigma_i - 1}{\sigma_i}\right)} + (1-\beta_i) QK_i^{\left(\frac{\sigma_i - 1}{\sigma_i}\right)} \right]^{\left(\frac{\sigma_i}{\sigma_i - 1}\right)} \qquad (1)$$

In equation (1) B_i is a shift parameter and β_i is a share parameter for labor. Substitution elasticity between capital and labor is shown as σ_i.

$$PF_i \; QV_i = wQL_i + rQK_i \qquad (2)$$

As a result of optimization from equation (1) and (2), input demand functions equation (3) and (4) can be found. Equation (5) shows price index for value added production.

$$QL_i = \frac{PV_i \; QV_i (\beta_i / w)^{\sigma_i}}{\beta_i^{\sigma_i} w^{1-\sigma_i} + (1-\beta_i)^{\sigma_i} r^{1-\sigma_i}} \qquad (3)$$

$$QK_i = \frac{PV_i \; QV_i ((1-\beta_i)/r)^{\sigma_i}}{\beta_i^{\sigma_i} w^{1-\sigma_i} + (1-\beta_i)^{\sigma_i} r^{1-\sigma_i}} \qquad (4)$$

$$PV_i = \frac{1}{\mathrm{B}_i} \left[\beta_i w^{1-\sigma_i} + (1-\beta_i) r^{1-\sigma_i} \right]^{1/(1-\sigma_i)} \qquad (5)$$

In addition to this, equation (6) gives CES output function:

$$QA_{j,i} = \Gamma_{j,i} \left[\gamma_{j,i} QD_{j,i}^{\left(\frac{\phi_j - 1}{\phi_j}\right)} + (1-\gamma_{j,i}) QM_{j,i}^{\left(\frac{\phi_j - 1}{\phi_j}\right)} \right]^{\left(\frac{\phi_j}{\phi_j - 1}\right)} \qquad (6)$$

Equation (7) suggests zero-profit condition equation between income and expenditure.

$$PA_{j,i}QA_{j,i} = PD_{j}QD_{j,i} + PM_{j}QM_{j,i} \tag{7}$$

Equation (8) and (9) gives input demands for imported ($QM_{j,i}$) and domestic goods ($QD_{j,i}$)

$$QD_{j,i} = \frac{PA_{j,i}QA_{j,i}\left(\gamma_{j,i}/PD_{j}\right)^{\phi_j}}{\gamma_{j,i}^{\phi_j}PD_{j}^{1-\phi_j} + \left(1-\gamma_{j,i}\right)^{\phi_j}PM_{j}^{1-\phi_j}} \tag{8}$$

$$QM_{j,i} = \frac{PA_{j,i}QA_{j,i}\left(\left(1-\gamma_{j,i}\right)/PM_{j}\right)^{\phi_j}}{\gamma_{j,i}^{\phi_j}PD_{j}^{1-\phi_j} + \left(1-\gamma_{j,i}\right)^{\phi_j}PM_{j}^{1-\phi_j}} \tag{9}$$

$\Gamma_{j,i}$ is a shift coefficient and $\gamma_{j,i}$ is a share coefficient and ϕ_j is shown substitution elasticity between domestic and imported goods.

Intermediate demand in production function is obtained with Leontief type production technology. Total production is allocated between domestic demand and exports with exerting constant transformation elasticity. Output is defined as a Leontief function of intermediate inputs and value added.

Equation (10) gives transformation function (CET) of output and equation (11) shows revenue-cost condition for output transformation. Equation (12) and (13) suggests supply functions of output.

$$Q_i = \mathrm{X}_i\left[\chi_i QX_i^{\left(\frac{\tau_i-1}{\tau_i}\right)} + (1-\chi_i)QD_i^{\left(\frac{\tau_i-1}{\tau_i}\right)}\right]^{\left(\frac{\tau_i}{\tau_i-1}\right)} \tag{10}$$

$$P_iQ_i = PX_iQX_i + PD_iQD_i \tag{11}$$

$$QX_i = \frac{P_i\,Q_i\left(\chi_i/PX_I\right)^{\tau_i}}{\chi_i^{\tau_i}PX_i^{1-\tau_i} + \left(1-\chi_i\right)^{\tau_i}PD_i^{1-\tau_i}} \tag{12}$$

$$QD_i = \frac{P_i\,Q_i\left(\left(1-\chi_i\right)/PD_I\right)^{\tau_i}}{\chi_i^{\tau_i}PX_i^{1-\tau_i} + \left(1-\chi_i\right)^{\tau_i}PD_i^{1-\tau_i}} \tag{13}$$

2.1.2 Factor Behaviors

At factor markets, under the framework of profit maximization optimal factor usage amount can be found as a result of equating marginal product incomes of production factors to factors' cost. Production factors, labor and capital are mobile between sectors. Factor demand equations as shown below:

$$L_i = \left(\frac{X_i}{\Gamma_i}\right)^{1-\sigma_i} \left(PVA_i \frac{\delta_i}{\lambda_i^w w}\right)^{\sigma_i} \tag{14}$$

$$K_i = \left(\frac{X_i}{\Gamma_i}\right)^{1-\sigma_i} \left(PVA_i \frac{1-\delta_i}{\lambda_i^r r}\right)^{\sigma_i} \tag{15}$$

σ_i shows elasticity of substitution of CES production between labor and demand. Γ_i productivity parameter of CES production function of sector and w and r show the factor prices of labor and capital respectively. PVAi defines price of value added. Optimal factor demand for essential value added (QVA) is summation of QCAP (capital demand) and QLAB (labor demand) is shown equation (16) and (17).

$$\text{QVA}= \alpha_{va} \left(\delta_{va} QCAP^{-\rho_{va}} + (1-\delta_{va}) QLAB^{-\rho_{va}} \right)^{-\frac{1}{\rho_{va}}} \tag{16}$$

$$PVA_i = \frac{X_i}{\Gamma_i} \left(\delta_i^{\sigma_i} (\lambda_i^w w)^{1-\sigma_i} + (1-\delta_i)^{\sigma_i} (\lambda_i^r r)^{1-\sigma_i} \right)^{\frac{1}{1-\sigma_i}} \tag{17}$$

α_{va} is an efficiency parameter (technology index), δ_{va} is the share of production factors in value added and ρ_{va} is the degree of substitution elasticity between factors. $PVAi$ is the price index for value added.

PCAP and PLAB represent the input prices of capital and labor respectively. t_{va} is a tax rate which levied on value added and shows as a ratio $t_{va} = \frac{T_{VA}}{PVA.QVA}$.

And, then input prices of factors are shown in equation (18) and (19).

$$PLAB = PVA(1-t_{va})QVA(\delta_{va} QCAP^{-\rho_{va}} + (1-\sigma_{va}) QLAB^{-\rho_{va}})^{-\frac{1}{\rho_{va}}-1} (1-\delta_{va}) QLAB^{-\rho_{va}-1} \tag{18}$$

$$PCAP = PVA(1-t_{va})QVA(\delta_{va} QCAP^{-\rho_{va}} + (1-\delta_{va}) QLAB^{-\rho_{va}})^{-\frac{1}{\rho_{va}}-1} \delta_{va} QCAP^{-\rho_{va}-1} \tag{19}$$

Equation (20) and (21) show the equilibrium of factor markets. This means factor demands and factor supplies are equal for all sectors.

$$\overline{K} = \sum_i QK_i \tag{20}$$

$$\overline{L} = \sum_i QL_i \tag{21}$$

2.1.3 Consumer Behaviors

In model, there are two consumers: a private household and government. These two agents demand goods and services. Households receive from factor incomes and social security and pension income from government and purchases on consumption and give some to government as net transfers. Net transfers include all indirect and direct taxes. Private consumption is modeled by using Stone-Geary (linear) expenditure system (LES). In this model, consumer demand is constant for the minimum requirements amount for each goods.

2.1.3.1 Public Consumption

There are many sources of government income: Equation 22a, 22b, 22c, and 22d show net production tax (R^Q), value added tax (R^V), import tariffs (R^M) and income taxes (R^Y) respectively.

$$R^Q = \sum_i TO_i P_i Q_i \tag{22a}$$

$$R^V = \sum_i TV_i \left(P_i Q_i + ER.\overline{PM}_i MW_i \right) \tag{22b}$$

$$R^M = \sum_i TM_i ER.\overline{PM}_i MW_i \tag{22c}$$

$$R^Y = \sum_i QK_i rTK + QL_i wTL \tag{22d}$$

Government purchases goods and services to ensure public activities which obtain income from taxation and other transfers from households. Equation (23) shows government income as a summation of equations (22a-d).

$$R = \sum_i \begin{pmatrix} TO_i P_i Q_i + TV_i \left(P_i Q_i + ER.\overline{PM}_i MW_i \right) + TM_i ER.\overline{PM}_i MW_i \\ + QK_i rTK + QL_i wTL \end{pmatrix} \tag{23}$$

2.1.3.2 Private Consumption

Equation 24 shows disposable income (Y). $\overline{L}$ and $\overline{K}$ show constant factor endowment of labor and capital, $\overline{TB}$ is constant trade balance, e is foreign exchange and w and r factor prices, NT is net transfers to government. TL and TK represent income taxes from labor and capital revenues.

$$Y = \overline{L}w(1 - TL) + \overline{K}r(1 - TK) - \overline{TB}.e - NT \tag{24}$$

Equation (25) shows private utility function. Utility defines as a Cobb-Douglas function of private consumption C_{PC}, domestic tourism consumption (citizens living abroad) C_{DT} and savings C_{IN} (consumption of investment goods).

$$U = C_{PC}^{\gamma_{PC}} C_{DT}^{\gamma_{DT}} C_{IN}^{\gamma_{IN}} \tag{25}$$

γ_{PC}, γ_{DT} and γ_{IN} parameters show expenditure ratio of consumption types and summation of them equals to 1. Equation (26) gives income-expenditure relations for private consumption:

$$Y = P_{PC}C_{PC} + \sum_i \left(PD_i \overline{F_i^D} + PM_i \overline{F_i^M}\right) + P_{DT}\left(C_{DT} + \overline{F_{DT}}\right) + P_{IN}\left(C_{IN} + \overline{F_{IN}}\right) \tag{26}$$

From equation (25) and (26), utility maximization gives consumption equations which below:

$$C_{PC} = \frac{\gamma_{PC} Y}{P_{PC}} \tag{27}$$

$$C_{DT} = \frac{\gamma_{DT} Y}{P_{DT}} \tag{28}$$

$$C_{IN} = \frac{\gamma_{IN} Y}{P_{IN}} \tag{29}$$

2.1.3.4 Private Savings

Representative households receive income from labor and capital and they allocate this income between final consumption and savings to maximize Cobb-Douglas utility function:

$$Y = wxL + rxK \tag{30}$$

Y stands for income and private savings are shown below:

$$S^H = (1 - s_h)(1 - t_y)Y \tag{31}$$

2.1.4 Income Equations

In this model, household income (Y_h) is defined as the summation of factors' (labour and capital) incomes (wage, rants from capital (at domestic and foreign markets), incomes from government (TGH), and incomes from firms (TFH) and from other households (THH) and transfers from the rest of the world (TWH) :

$$Y_h = \left[\sum_i \sum_k W_k L_{kih} + \sum_i (PN_i X_i - \sum_k W_k L_{ki})_h + (TGH) + (TFH) + (THH) + (TWH)\overline{ER} \right] \quad (32)$$

Firms income (Y_f) is defined as the summation of the rest of the payments for capital which used for production, transfers from other firms (TFF) and transfers from the rest of the world (TWF):

$$Y_f = \left[\sum_i (PN_i X_i - \sum_k W_k L_{ki}) + (TFF) + (TWF)\overline{ER} \right] \quad (33)$$

Government income (Y_g) is defined as the summation of incomes from capital which used for production, taxes (from households, firms and institutions), indirect taxes on goods and transfers from abroad:

$$Y_g = \left[\sum_i (PN_i X_i - \sum_k W_k L_{ki}) + \sum_h t_h Y_h + \sum_f tfY_f + \sum_i td_i X_i^S PD_i + (TWG)\overline{ER} \right] \quad (34)$$

2.1.5 Trade Equations and Goods Prices

For the cross-border trade, there are two assumptions for the model. Firstly Turkey is a small country; it has no power to effect export and import prices. The other one is Armington approach. According to these assumptions, the domestic price of a goods (P_i) can be written as as CES function of internal price of imported goods and the price of domestic goods :

$$P_i = \left[\alpha_d PD_i^{(\sigma_i - 1)/\sigma_i} + (1 - \alpha_d) PM_i^{(\sigma_i - 1)/\sigma_i} \right]^{\sigma_i/(\sigma_i - 1)} \quad (35)$$

2.1.5.1 Exports

The prices of exports of goods are fixed because of world prices. Therefore, domestic price of goods must be equal to world price multiply with exchange rate (ER):

$$PX_i = ER.\overline{PX_i} \quad (36)$$

2.1.5.2 Imports

Import prices are fixed according to world prices, however there is a tax (import tariff) when goods enter into domestic country. Therefore, the domestic price of imported goods also includes a value added tax.

$$PM_i = \frac{(1 + TM_i + TV_i)}{(1 + \overline{TM_i} + \overline{TV_i})} ER.\overline{PM_i} \quad (37)$$

Because of the Harberger convention, equation (38) is set out in a way that allows $PM_i = 1$ in the benchmark ($\overline{PM_i} = 1, ER = 1, TM_i = \overline{TM}_i, TV_i = \overline{TV}_i$). Imports at domestic prices (M_i) are related to imports at world prices (MW_i) so that equation (39) is as below:

$$M_i = \left(1 + \overline{TM}_i + \overline{TV}_i\right) MW_i \tag{38}$$

2.1.5.3 Balance of Payments

The last equation of the model is balance of payment is shown below: This equation equates net exports (including tourism) to exogenous trade balance level.

$$\overline{TB} = \left(\sum_{i \in G} \overline{PX}_i QX_i - \overline{PM}_i MW_i \right) + C_{FT} \frac{P_{FT}}{ER} \tag{39}$$

2.1.6 Markets

In this model, there are three markets as domestic goods market, imported goods market and factor market. Equation (40) shows domestic goods market equilibrium. In this equilibrium, the summation of minimum requirements of private households and intermediate and final uses gives the production of domestic market.

$$QQ_i = \sum_{j \in G} QD_{i,j} + \sum_{j \in N} QD_{i,j} + \overline{F_i^D} \tag{40}$$

Equation 41 shows the equilibrium for imported goods market. In this equation, total imports of each good with the sum of intermediate and final uses plus the private household's minimum requirements gives the equilibrium for imported goods market.

$$M_i = \sum_{j \in G} QM_{i,j} + \sum_{j \in N} QM_{i,j} + \overline{F_i^M} \tag{41}$$

Equations 42 and 43 describe equilibrium in the two factor markets, equating total supply (exogenously specified) with the sum of demand from production sectors.

$$\overline{K} = \sum_i QK_i \tag{42}$$

$$\overline{L} = \sum_i QL_i \tag{43}$$

3. Model Closure Rule

Model closure rules are varied according to applications in the model. This model is closed to satisfy Walras' Law and using standard savings-investment closure rule. This closure rule is also named as macro closure rule and it shows total investment is savings-driven. Under this condition, total savings must be equal to total investment. This definition is known as neoclassical closure rule in general equilibrium literature.

The closure rule of the model (savings-investment equilibrium) is shown below:

$$PS + GS + \varepsilon CAdef = PINV + GINV \tag{44}$$

This equation equates total savings to total investments. The total of private savings (PS) and public savings (GS) equal to private investments (PINV) and public investments (GINV). If public savings do not meet public investments, public either borrow from private savings or equate this difference by using foreign exchange.

CAdef shows current account balance as exchange rate and CAdef composes of income side (export revenue, workers' remittances and private and public borrowings) and expenditure side (import cost, profit transfers to abroad and interest payments for private and public debt stocks). The difference between income and expenditure side gives CAdef value as shown Equation (45).

$$CA\,def = \sum P_i^w X_i + ROW^H + FB^P + FB^G - \left[\sum P_i^w M_i + ROW^T \sum PRO + r^P FD^P + r^G FD^G\right] \tag{45}$$

Private and public foreign capital flows are fixed as foreign exchange. In this equation CAdef is a current account variable and it is exogenous.

4. Elasticity Measures

Like the other CGE models, in this model some elasticity values are used and all other parameters are calibrated 2002 benchmark equilibrium. Armington substitution elasticity between domestic and imported goods is borrowed from Harrison et.al (1994) article's estimation values about Turkey. These Armington values are generally 2.000. ESUB_KL (the other name is K/L ratio) values are also borrowed from Salem's (2001) paper. In this paper Salem estimated K/L ratios for Tunisia. The own price elasticity of tourism is defined as unit. Model is based on tourism, so that the own price elasticity of tourism is considered an important parameter. The shift parameter of foreign tourism demand (DSFOREIGN) and the shift parameter of domestic (this means citizens living abroad and visiting Turkey) tourism demand (DSRESIDENT) are defined as 1. Because of Harberger convention, the world price of export, WPX(i) and the world price of import WPM(I) are equated to 1. Tourism demand elasticities are defined – 2 for both domestic and foreign tourism.

Table 2 shows some elasticity values which used in the model. ESUB_DM is Armington substitution elasticity of between domestic and imported goods. ESUB_KL shows elasticity of substitution between production factors. Elasticities of substitution between intermediate inputs and the value added composite in each sector, ESUB_IO, assumed to be 0 in all sectors reflecting the Leontief tradition for intermediate input substitutability (Rutherford vd., 1994).

The average K/L ratio of the economy is 0.847 and the K/L ratio for hotel and restaurant sector which is main sector of tourism is 0, 27. Hotel and restaurant sector ratio is below the average of the economy and this shows that this sector is labor-intensive.

Table 2

5. Conclusion

In this study, developed a computable general equilibrium (CGE) model to quantify impacts on Turkish welfare, employment, and value-added by sector, revenue implications for the government, and other relevant variables. Employing, there is a 10 percent increase foreign tourism demand of Turkey scenario, we investigate the results.

In this section, we provide an overview of results. The results of this simulation are shown at Table 3 and Table 4. Results suggest that, if there is a 10 percent increase foreign tourism demand of Turkey, it has generally increasing effects on output. For example, there is 4.13 % increase in output for hotels and restaurants (accommodation). However there are some slight increases for transportation sector 0.07% and the increase rate for food and beverage sector 0.60 %. The more tourists cause more production for food and beverage. The suppliers produce more to meet tourist's demand. There is also an increase other tourism-related sector such as travel agencies. This sector realises 0.27 % increases after the simulation. Generally tourism-related sectors were affected positively. For example, such as recreational, cultural and sporting activities and real estate activities have positive values. There are 0.73 % and 0.03 % increases respectively. Results suggest that households' incomes increase (3.6%) , and households purchase more goods and services from other sectors.

Table 3

If, there is a 10 percent increase foreign tourism demand of Turkey, the employment of hotels and restaurants increasing. This stems from tourism sector is labour-intensive. After this simulation, the employment level of hotels and restaurants increased by 4.16 %, the employment of transportation and food and beverage also increased by 0.27% and 0.68 % respectively. This simulation shows that travel agencies by 0.39 % employment increases. Similarly, there is a 0.32 % increase on employment of agricultural sector. It is possible to say that, tourism related sectors are generally labour intensive sector. Investigating the capital change results, the capital level of accommodation sector increased (4.11%) as well. These values are 0.03 % for transportation sector, 0.56 % for food and beverage sector and 0.23 % for the travel agencies and tour operators. There is a 0.65 % capital increasing effect on recreational, cultural and sporting activities when this simulation employs.

If, there is a 10 percent increase foreign tourism demand of Turkey, the results of pi (the price of goods) values for tourism-related sectors are generally same. These rates are 0.53 %, 0.56 %, 0.54 % for accommodation sector, travel agencies and food and beverage sector, respectively. These results show that a 10 percent increase foreign tourism demand increases the price of goods or services for all sectors. If tourism demand is increased 10 percent, tourism uses more resources in Turkey and become more expensive. In other words, because of the limitation of production capacity of tourism industries, increased tourism demand may cause an increase in domestic prices.

The simulation-there is a 10 percent increase foreign tourism demand of Turkey- is also beneficial to welfare. As a result of this simulation welfare is increased % 0.03 of GDP. As a result of this scenario, government income increases 0.7%. Domestic (citizens living abroad) and foreign tourism are increased 9 % and 8.9 % respectively. The amount of investment is increased 0.01 % as a result of this simulation (Table 4).

Table 4

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Tables:

Table 1: The Share of Tourism Income in GDP and Exports

Year	GDP (1) (billion $)	Exports (2) (billion $)	Tourism Income (3) (billion $)	(3)/(1) (%)	(3)/(2) (%)
1990	150	13,0	3,2	2.1	24.6
1991	150	13,6	2,7	1.8	19.8
1995	170	21,6	5,0	2.9	23.1
2000	265	27,8	7,6	2.9	27.3
2001	197	31,3	8,1	4.1	25.9
2002	230	36,1	11,9	5.2	33.0
2003	305	47,3	13,2	4.3	27.9
2004	390	63,2	15,9	4.1	25.2
2005	481	73,5	18,2	3.8	24.7
2006	526	85,5	16,9	3.2	19.8
2007	659	107,2	18,5	2.8	17.3
2008	742	131,9	21,9	2.9	16.6
2009	616	102,1	21,2	3.4	20.7

Source: Turkish Tourism Investors Association (Accession date: 06.03.2011)

Table 2: Sector Elasticities

No	CODE	Sectors	ESUB_KL	ESUB_DM	ESUB_IO
01	AGR	Agriculture	0.966	2.000	0.0
02	MIN	Mining of coal and lignite	0.906	0.750	0.0
03	FDB	Manufacture of food products and beverages	0.737	1.550	0.0
04	TEX	Manufacture of textiles	1.000	3.550	0.0
05	WOO	Manufacture of wood and products of wood	0.952	2.000	0.0
06	COK	Manufacture of coke and refined petroleum products	0.952	0.820	0.0
07	MET	Production of metal products	0.952	1.120	0.0
08	EGS	Electricity, gas and steam supply	0.956	2.000	0.0
09	CON	Construction	0.972	2.000	0.0
10	MOT	Sale and repair of motor vehicles	0.291	2.000	0.0
11	RET	Retail Trade	0.092	2.000	0.0
12	HOR	Hotels and Restaurants	0.277	2.000	0.0
13	TRA	Transportation (Land,sea and air)	1.556	1.250	0.0
14	STA	Supportive Travel Agencies Services	1.000	2.000	0.0
15	COM	Post and Communication	1.556	2.000	0.0
16	FOS	Financial and other (defence, education and health etc.) services	0.092	2.000	0.0
17	RES	Real Estate Activities	1.000	2.000	0.0

18	CSR	Culture, Sports and Recreational Activities	1.000	2.000	0.0

Table 3: Results from Tourism Simulations (% changes)

		Output	Labour	Capital	Land	EXP	Pi
1	Agriculture, forestry and fishing	0.17	0.32	0.17	3.85	-0.95	0.59
2	Mining	-0.46	-0.38	-0.52		-0.82	0.52
3	Manufacture of food and beverages	0.60	0.68	0.56		-0.23	0.54
4	Manufacture of textile products	-1.80	-1.70	-1.86		-3.77	0.77
5	Manufacture of wood products	-0.16	-0.07	-0.22		-1.07	0.52
6	Manufacture of coke and refined petrol products	-0.34	-0.25	-0.40		-0.67	0.46
7	Manufacture of metallic products	-0.64	-0.55	-0.70		-1.10	0.59
8	Manufacture of electricity, gas and stream	0.01	0.13	-0.02		-0.87	0.44
9	Construction	0.09	0.19	0.04		-0.82	0.48
10	Motor vehicles and parts	-0.17	-0.13	-0.18		-1.21	0.55
11	Retail Trade	-0.13	-0.11	-0.13		-1.22	0.58
12	Hotels and Restaurants	4.13	4.16	4.11			0.53
13	Transportation	0.07	0.27	0.03		-0.59	0.55
14	Supportive Travel Agencies' Activities	0.27	0.39	0.23		-0.80	0.56
15	Post and Communication	0.07	0.24	-3.74		-0.95	0.52
16	Financial and other services	-0.03	-0.02	-0.03		-1.01	0.51
17	Real Estate Activities	0.03	0.18	0.02			0.57
18	Cultural, sportive and recreational activities	0.73	0.81	0.65			0.50

Table 4: Results from Tourism Simulations (% changes)

Welfare	0.03
EV	140.2
Government Income	0.7
Domestic tourism	9
Investment	0.01
Foreign tourism	8.9