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Abstract

The effects of climate change on the overall economy necessitate taking into account backward and forward linkages of agriculture. However, the number of studies that relate climate change to agricultural production in Turkey through a sector or economy wide model is limited. Hence, further quantification of the effects of climate change on agricultural and overall economy is required to ponder about the possible impact of the climate change. This paper presents the results of a CGE modeling framework with enhanced regionalization. In addition the base year of the model is 2008. The model disaggregates national economy to 12 NUTS 1 regions. Results of global and regional climate models are used to run simulations about climate change. The results suggest that effects of climate change are significant and that regional interactions are important in understanding these effects. Our results support the fact that climate change mitigation should be considered as an integrated issue that would cause complicated results. Hence, any climate change mitigation policy needs to be region specific but should also consider the interaction among the regions.

ملخص

رغم أهمية آثار تغير المناخ على الاقتصاد الكلي فى كلا من العلاقات المباشرة و غير المباشرة بالزراعة ، نجد ندرة فى الدراسات التي تربط بين تغير المناخ و الإنتاج الزراعي في تركيا من خلال قطاع أو نموذج اقتصاد واسع. وبالتالي، يجب التعامل مع المزيد من التحديد الكمي لآثار تغير المناخ على الزراعة والإقتصاد ككل للتفكير فى التأثير المحتمل لتغير المناخ. و من هذا المنطلق تعرض هذه الورقة نتائج إطار نموذج CGE مع المزيد من الإقليمية ، مع افتراض سنة الأساس لهذا النموذج هي عام 2008. و يقسم النموذج الاقتصاد الوطني إلى 1 NUTS 12 من المناطق. وتستخدم نتائج النماذج المناخية العالمية والإقليمية لإقامة محاكات حول تغير المناخ. وتشير النتائج إلى أهمية آثار تغير المناخ وكذلك التفاعلات الإقليمية في فهم هذه الآثار. كما تدعم نتائجنا حقيقة أنه ينبغي إعتبار تخفيف آثار تغير المناخ كقضية متكاملة من شأنها أن تؤدي إلى نتائج معقدة. وبالتالي، تحتاج أية سياسة لتخفيف آثار تغير المناخ إلى أن تكون مرتبطة بمنطقة معينة، مع الاخذ فى الاعتبار التفاعل بين المناطق.

1. Introduction

Agricultural production in Turkey continues to depend heavily on the climatic conditions partly due to arid nature of agricultural production, but also because of the ineffective use of already developed irrigation infrastructure. Many researchers study the probable effects of climate change on the technical conditions of agricultural production and the effects are expected to be significant (Cline, 2007; Kadıoğlu and Şaylan, 2000; Kadıoğlu, 2008; Fujihara et al., 2008; Komuscu et al., 1998; Kapur et al., 2007). The common conclusion of these studies is that growing-degree days will be prolonged and Turkey will experience hotter and drier summers along with milder and drier winters. Further, the number of drought years is expected to rise due to increasing frequency of hydrological extremes (Fujihara et al., 2008; Sensoy et al., 2007). Implications of these changes on agricultural yields and production are also well quantified by various researchers (Çaldağ and Şaylan, 2005; Şaylan and Çaldağ, 2007; Kapur et al., 2007).

The effects of climate change on the overall economy necessitate taking into account backward and forward linkages of agriculture. Although the share of agricultural value added in GDP is relatively low (10 percent in 2009), its share in employment is still significant with 25 percent. However, the number of studies that relate climate change to agricultural production in Turkey through a sector or economy wide model is quite limited. Hence, further quantification of the effects of climate change on agricultural and overall economy is necessary.

Dudu et al. (2010a) used a Walrasian CGE model to link the effects of climate change to the whole economy through the agricultural sector. The agricultural sector has 19 crops for 5 regions. The model is calibrated to a 2003 social accounting matrix. Decline in rain-fed agriculture and an increase in irrigated activities have been observed. Significant falls in the production levels of major crops are accompanied by the increase in prices, despite increasing net imports of agricultural commodities. The partial equilibrium models used to study the impact of climate change in agriculture have limited number of crops and they lack the potential feedback impact (Dellal and McCarl, 2004 and 2009).

Although the CGE and partial equilibrium approaches used so far are valuable efforts to understand the effects of climate change on Turkish economy, they both suffer from important deficiencies in terms of data and modeling limitations. Apart from the global financial crisis period, Turkish economy has been able to achieve a sustained growth since 2001, partly due to the macroeconomic stabilization program. The base period for the CGE model needed to be updated. The partial equilibrium models have limited number of crops and related activities and they ignore the linkages between agriculture and the rest of the economy.

The main research question of this study is quantifying the effects of climate change on agricultural sector and regional economy by taking into account the interregional interactions and dynamics of the adjustment to the new equilibrium under well-established climate scenarios for Turkey. We expect to shed light on the effects on consumer and producer welfare in each region, national accounts and trade balances.

Dudu and Çakmak (2010b) attempt to quantify the effects of climate change on agricultural sector and regional economy by taking into account the interregional interactions and dynamics of the adjustment to the new equilibrium under well-established climate scenarios. They update the base year of data to 2008, increase the regional detail and enhance the interaction among regions. However, simulations conducted with the model are rather experimental, since they try to illustrate the importance of interregional interactions by giving climate shocks to different regions. The results of climate models are translated into CGE framework as yield shocks based on the estimates in the literature.

The model that will be used in this study enhances previous CGE modeling framework in Dudu et al., (2010a) by using a better regional disaggregation and by updating the calibration year to 2008. Regional economic activities are modeled explicitly at NUTS I level. In that way we will be able to include theoretical contributions from regional location theory in the CGE framework. Further, agricultural production explicitly depends on the amount of rainfall. Hence the results of climate models can be translated to the CGE framework directly. A detailed discussion on data requirements and availability can be found in Çakmak et al. (2008).

2. Data

The aggregate version of the SAM used in the analysis follows from Yiğiteli (2010). Various data sources are used to regionalize the 2008 National SAM, under several assumptions. The country is divided into 12 regions according to NUTS-1 classification.

Water is introduced as a factor of production. Income generated by water as a production factor is also distributed to households (HHs) according to their share in income generated by capital, which is distributed through firms. Hence payments from capital to firms are discounted by the total amount of income generated by water. Then payments from firms to HHs are also discounted by the amount of income that each HHs receives from water factor.

There is no regional I/O data available for Turkey. Hence we had to make some assumptions to produce a regional I/O from the national I/O. First of all, agricultural value-added is distributed among regions according to 2008 data (TURKSTAT, 2010a). Then, I/O is also distributed according to regions' shares in the value added by assuming that the combination of intermediate inputs used by agriculture is similar across regions, Value added and I/O in the rest of the sectors are distributed according to the number of insured people in 2008 in these sectors (SSI, 2008). [1]

Regional disaggregation of trade is accomplished by using TurkSTAT's Regional Foreign Trade database for the Year 2008 (TurkSTAT, 2010b). Agriculture, energy, manufacturing and services are disaggregated directly by using the shares of regions in the trade of these sectors. For exports of food and textile sectors regional trade data are not available. Hence we made an adjustment by taking into account the share of region in the national production of that sector and region's share in the trade of manufacturing using the following formula:

$$\frac{\dfrac{X_{Q\in R}}{\sum_R X_R}\dfrac{Y_{Q\in R}}{\sum_R Y_R}}{\sum_S \dfrac{X_{S\subset R}}{\sum_R X_R}\dfrac{Y_{S\subset R}}{\sum_R Y_R}}$$

where X is regions production in the sector and Y is volume of regions trade in manufacturing. We ignored the final shares that are less than 1 percent. For imports we used the regions' shares in manufacturing trade directly.

Consumption is disaggregated according to TURKSTAT (2010c) by using 2003 household consumption data. We assume that share of a commodity in the total consumption of a household type does not change across regions[2]. We also assume that HHs do not consume any commodities from other regions. Government consumption is distributed according to the

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[1] Transfers of intermediate inputs are not allowed across regions, since there is no reliable data about interregional input trade.

[2] Distribution of household consumption according to regions and income quintiles data that TURKSTAT made available recently (TURKSTAT, 2010c) shows that the actual situation is not much different.

2008 Public Accounts Bulletin of General Directorate of Public Accounts (GDPA, 2010a). Government consumption in each sector is distributed according to the region's share in total government expenditures on goods and services purchases. Transfers are also distributed according to 2008 Public Accounts Bulletin of General Directorate of Public Accounts (GDPA, 2010b). On the other hand, investments in different sectors are distributed according to region's share in value added.

The flow from commodity accounts to activity accounts is the key regional interaction term. Interregional trade is calculated as a residual and any transportation cost is ignored. We first found the difference between a region's production and consumption. Then we distributed the difference as a transfer from other regions according to the share of other regions in national production. Regions of which production exceeds consumption are assumed to consume only their own products and export rest of the products to other regions. For importing regions, the imported amount is subtracted from the region's production to keep the balance between consumption and production. That is we assume that interregional trade is done among producers of exporting region and wholesalers of importing region. Hence value added produced in a region also includes the value of commodities obtained by trade. A better alternative would have been introducing interregional trade through households but due to lack of data this option is not viable for the current model. [3]

Factor incomes are distributed according to shares of regions in factor value added. After finding the share of each region in factor income, income is distributed according to the original shares of Households types in national incomes. However since capital income is distributed through the regional firms, we had to make an adjustment to keep the balance of SAM. By discounting payments from firm of region *R* to the government and to the rest of the world, the remaining amount of income generated by capital factor of region *R* is distributed to the households according to their share in national capital income. Then the difference between row and column sum of the firm account is added to government transfers to the firm.

Profit transfers to abroad and workers' remittances from rest of the world are distributed according to shares of regions in national capital income[4]. We used the regions' share in number of people receiving pensions reported by SSI Yearbook 2008 (SSI, 2010) to distribute the transfers from SSI to households. Other transfers from government to households are distributed according to 2009 Annual Report of Social Assistance and Solidarity Fund by looking at the shares of regions in total transfers. Government savings and payments to ROW by government as well as tax incomes of government are not distributed since both accounts are national.

Tax payments of domestic institutions are distributed according to the 2008 Accrued and Realized Cumulative Tax Incomes in General Budget that is published by General Directorate of Public Accounts. We used accrued tax amounts in calculating the shares.

Some minor adjustments in SAM were necessary for the very small figures in the regional trade and I/O tables to prevent scaling issues as a result of regional disaggregation. For instance, very small figures for the energy trade of North West and Central Regions as well as food trade of East region needed adjustment. Small exports were added to S-I account. For imports, the import tax figures were deducted from S-I account. A similar adjustment was

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[3] This interregional trade is neutral in the sense that, we do not introduce any behavioral assumption for wholesalers. They only transport the goods of the importing sector to the suppliers of exporting sectors and there is no transaction cost in the process. Further, we also assume that the commodities from different regions are perfectly substitutable.

[4] The method of distribution of remittances from abroad does not have a significant effect on the model, since the share of remittances in household income is about 0.2 percent.

made for interregional trade, as well. Accordingly, adding these figures to the production of consuming region eliminated the small interregional trade. Then the difference was added to S-I account. The sum of moved figures were added to government savings and discounted from the transfers from rest of the world to government. I/O table was also adjusted for small figures. Small figures flowing from agriculture activity to energy, services, commodities were added to labor value added. The increase in the income generated by labor value added was distributed to households. Then the consumption of the 5th quintile household was increased accordingly to balance the commodity accounts.

Lastly, the rainfall data for 2008 follows from the results of the "Climate Change Scenarios for Turkey" project carried out by Istanbul Technical University and General Directorate of State Meteorological Services. The results depend on the ECHAM5 model of which details can be found in Roeckner et al. (2003). Results of ECHAM5 model are disaggregated to smaller scales with RegCM3 regional climate model to obtain projections for key environmental variables starting from 2000 until 2099 (CCST, 2010). The details of RegCM3 can be found in Pal et al. (2006). The results depend on IPCC-A2 emission scenario, which describes a very heterogeneous world under self-reliance and continuously increasing global population. Economic development is primarily regionally oriented and per capita economic growth and technological change are more fragmented and slower (IPCC, 2000).

3. Model and Scenarios

The model used in this paper is a modified version of Dudu et al. (2010a). The model is a Walrasian CGE model that includes the behavior of the three main sectors in the Turkish economy: the production activities, the institutions, and the foreign sector. In order to study the impact of a range of policy simulations, the model further disaggregates the economy at various levels: in the CGE model for Turkey, 7 activities produces commodities for 7 sectors. The activities are agriculture, food production, textiles, other manufacturing, services and private services.

Firms use labor, capital land and water for production. The income generated by these factors is distributed among 5 households and firms. Households receive income from labor, land and water while capital income goes to firms. Firms pay institutional taxes and makes transfers to the rest of the world out of this income and the rest is distributed to households together with the transfers from government. There are five types of households in the model. Households are differentiated according to income quintiles. Households use their income for consumption, savings and taxes. Government receives tax income from activities, commodities, firms and households as well as transfers from the rest of the world. This income is used for government consumption, transfers to households and firms, government savings and transfers to the rest of the world. Lastly, commodities receive payments from the rest of the world for exports and make payments the rest of the world for imports. Detailed structure of the model can be found in Cakmak et al. (2008).

Model closure rules follow conventional neoclassical assumptions. We assume that all factors are fully employed. Capital, water and land are activity specific while labor is mobile across regions and sectors. Consumer price index is the numeraire and hence is fixed while domestic price index is flexible. Savings are investment driven. Investment demand quantities are fixed and hence any change in investment is attributed to the change in prices. The exchange rate is fixed by allowing foreign savings to be flexible. The share of government demand in total absorption is also fixed. Lastly, government savings are flexible while the direct tax rates are fixed.

We run 3 simulations to measure the effects of climate change on the whole economy. Simulations are designed to shock the yields in agriculture following Dudu et al (2010).

However, distinctly from Dudu et al, the yield parameter is modeled to be a function of the rainfall for agriculture. Accordingly the production structure in agriculture is defined as

$$QVA_{R,A} = \widehat{\alpha}_{R,A} \left(\sum_{F \in \Im} \sum_{R1 \in \Re} \delta_{R1,F,R,A} \left(QF_{R1,F,R,A} \right)^{-\widehat{\rho}_{R,A}} \right)^{\frac{-1}{-\widehat{\rho}_{R,A}}}$$

where $\widehat{\alpha}_{R,A}$ are calibrated shift (or yield) parameters, $\widehat{\rho}_{R,A}$ are calibrated elasticity of substitution parameters, $\delta_{R1,F,R,A}$ are share parameters. $QVA_{R,A}$ are quantity produced in value added terms while $QF_{R1,F,R,A}$ are factor employments. $\Im$ is the set of factors and $\Re$ is the set of regions. The indices *R* and *R1* show the regions while *A* shows activities and *F* shows the factors.

The parameters $\widehat{\alpha}_{R,A}$ and $\widehat{\rho}_{R,A}$ are calibrated by using the first order conditions for cost minimization problem, as usual. Then the shift parameters $\widehat{\alpha}_{R,A}$ for agricultural sector are used to calculate the elasticity of yield with respect to rainfall as follows:

$$\widehat{\theta}_R = \frac{\ln\left(\widehat{\alpha}_{R,AGRI}\right)}{\ln\left(RF_R^{2008}\right)}$$

where RF_R^{2008} is the amount of rainfall in 2008 in region *R,* and *AGRI* is the index for agriculture. Hence the regional production function for agricultural sector can be written as

$$QVA_{R,AGRI} = \left(RF_R\right)^{\widehat{\theta}_R} \left(\sum_{F \in \Im} \sum_{R1 \in \Re} \delta_{R1,F,R,AGRI} \left(QF_{R1,F,R,AGRI} \right)^{-\widehat{\rho}_{R,AGRI}} \right)^{\frac{-1}{-\widehat{\rho}_{R,AGRI}}}$$

Thus the production in agricultural sector is a function of yearly rainfall in the region. This formulation allows a shock to the exogenous variable RF_R directly based on the results of climate models.

Maps in Figure 1 depict the change in estimated rainfall between 2000 and 2099 by the climate model. The effect of climate change on yearly rainfall will occur in 3 stages. The first stage is between 2010 and 2035 (Scenario A) where the precipitation will increase slightly in Western parts of the country while it will decline slightly in Eastern regions on average. The change in central regions is insignificant in the first stage. The second stage (Scenario B) will be between 2035 and 2085 where the decline in rainfall will be around 10 percent all around the country while it will be insignificant in the Northeastern parts. Central regions will be relatively more arid in this stage. Lastly, between 2085 and 2099, the decline will be between 20 and 30 percent for Western and Southeastern regions while it will again be insignificant for Eastern regions (Scenario C). Hence in our 3 scenarios, the effects of climate change gets worse over time for Western and Central regions while it is relatively less serious for the Eastern regions.

4. Findings

Simulation results suggest that effects of a climate change will not be much significant in the first stage but the effects are significant in the second and third stages. Decline in GDP is mainly due to agriculture and sectors closely related to agriculture. The decline in real terms is compensated by the price increases in agriculture and the value added produced by agriculture turns out to be increasing in nominal terms. However, food production is seriously hit by the yield change in agriculture. Effects on the other sectors are relatively small but still significant. Hence the macroeconomic effects of a climate shock are negative as expected.

However we need to separate the short run and long run effects. In the short run, climate change effects economy in a positive way by increasing GDP and favoring agricultural sector. In the long run this is significantly reversed. Hence it can be said that Turkey will have time to adjust to adverse effects of climate change for a limited period of time and this chance needs to be used well. Table 2 shows the effect of climate change on main macroeconomic variables. Under the first scenario, aggregate variables improve with increasing welfare indicators such as real absorption and household consumption. The share of investment and foreign savings in GDP increase while trade deficit increase.

Household income increases in the first scenario but declines in the second and third scenarios. The effect is relatively higher in western and central parts of the country where income distribution is relatively more unequal. The households in the lowest quintile own a smaller share of total regional income in these regions. Hence, households in these regions become more vulnerable to the welfare effects of climate change.

Table 4 shows the selected indicators for the agricultural sector. Agriculture is the most affected sector. Agricultural production increases between 2010 and 2035 by 2.35 percent. This is mainly due to the increasing yield in production. Wages faced by agricultural sector increased since marginal productivity of factors increase when yields increase. Consequently factor employment decreases. However, note that the decline in factor employment is quite low compared to the improvement in yield. Agricultural trade deficit significantly improves as a result of increasing exports and declining imports. The falling prices in agricultural sector combined with falling real exchange rate are the main driver for boosting exports and repressing imports.

The effects are reversed under the second and third scenario. Agriculture suffers from a serious fall in production under both scenarios. Factor employment drastically increases to compensate the loss in production due to declining yields. Agricultural trade deficit deteriorates tremendously. Imports increase by more than 20 percent while exports decrease by 24 percent. The figures are doubles under the third scenario. Increase in agricultural prices is also very high with 10 and 19 percent respectively.

In second and third scenarios, aggregate indicators deteriorate as the effects of climate change become more significant. Real absorption and household consumption declines while the share of investment and foreign savings in GDP falls. These depict a contraction in economy with significant welfare effects. Domestic price index slightly falls despite the declining production.

Food production is the second most affected sector from the climate change. Food production increases under scenario A but it declines significantly under the other scenarios. The change is due to factor employment rather than productivity. Factors of employment respond to the change in wages in all scenarios. The trade figures moves in the same direction compared to agricultural sector.

The other sectors follow the food production sector with less significant changes in production and employment. Detailed tables can be found in appendix.

The change in regional production is depicted in Figure 2. Under scenario A, value added produced in the Western and Central regions improve around 1 percent. However, the increase is more significant in Thrace and Southern Marmara regions. Decline in the Eastern and Southern regions are not much significant. Under scenario B value added falls in all regions. The decline is relatively moderate with 2 percent in Central, Northern and Western regions. The fall in value added is more than 3 percent in other regions. Note that although the decline in agricultural yields is not significant in Eastern and Northeastern regions, the decline in production is significant. This is due to the interregional links. Lastly, the third scenario worsens the production of Western and Southern regions as well as southeastern region significantly. This time the decline is relatively moderate in Eastern and Northeastern regions. Production in central regions also worsens but not as much as the other sectors.

5. Conclusion

Turkey consists of regions that are quite diverse in terms of social and geographical structures. The diverse structure of the regions is also reflected in economy in terms of different consumption and production patterns. Distinct regional structures bring about a quite complicated network of economic relationships. In order to develop a solid understanding of plausible effects of climate change on Turkish economy one needs to take into consideration the interaction between different regional structures.

In this paper we presented a CGE model that attempts to discover the links between regions and relationship of these links with a climate shock. For Turkey, a climate change strikes the economy by drastically changing the production and hence prices of commodities. Agriculture and food production is severely affected by the shock and prices of these commodities increase drastically. Households in the lowest quintile are likely to be affected more than the other household groups since an important part of their income is spent on food. The trade balance of the country worsens, and the need for agricultural and food imports become more severe and this in turn is likely to create concerns about food security.

Our results support the fact that climate change mitigation should be considered as an integrated issue that would cause complicated results. Hence, any climate change mitigation policy needs to be region specific but should also consider the interaction among the regions.

The model presented in this paper suffers many deficiencies and more efforts need to be devoted to shed light on the regional impacts of climate change. First of all the linkage between regions can be modeled more explicitly. Secondly sectoral details can be increased to reach more detailed results. Lastly a dynamic model would have given more information about the convergence to the new equilibrium.

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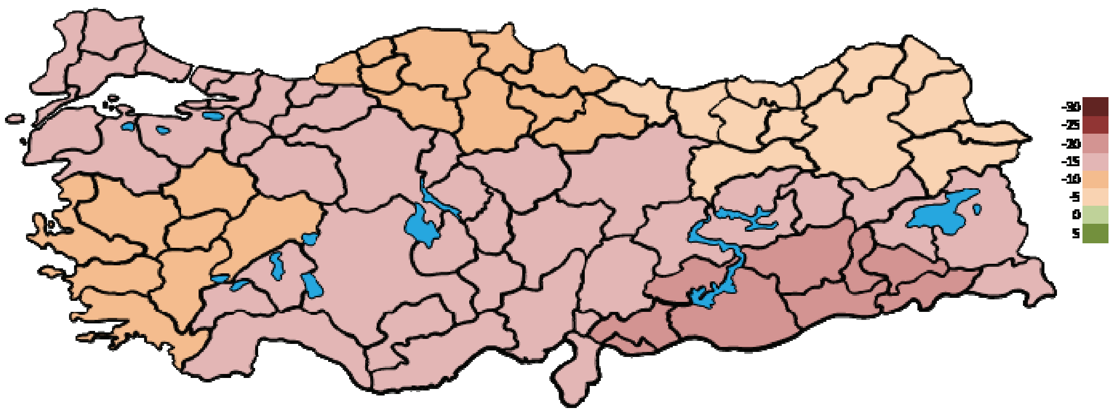
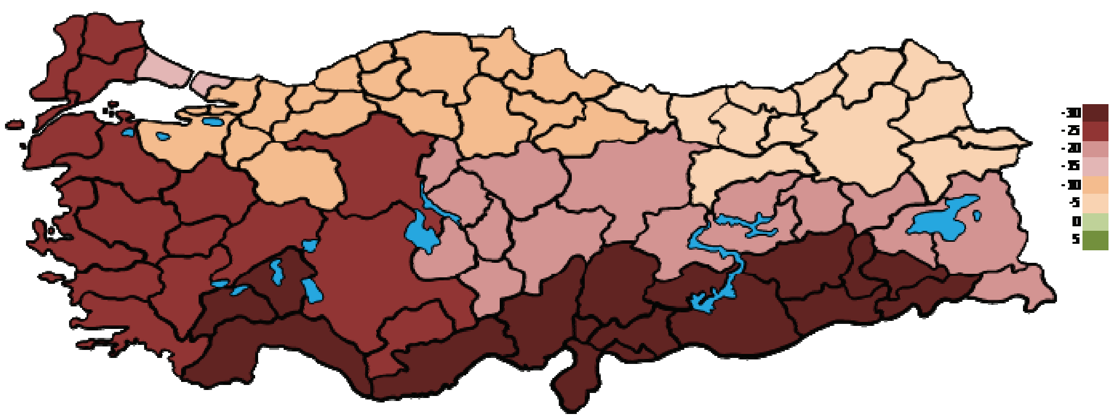
Figure 1: Scenarios Based on ECHAM5 Results for 2010-2099, Change in Yields (%, base year is 2008)

Scenario A: Scenario based on the results for 2010-2035

Scenario B: Scenario based on the results for 2035-2085



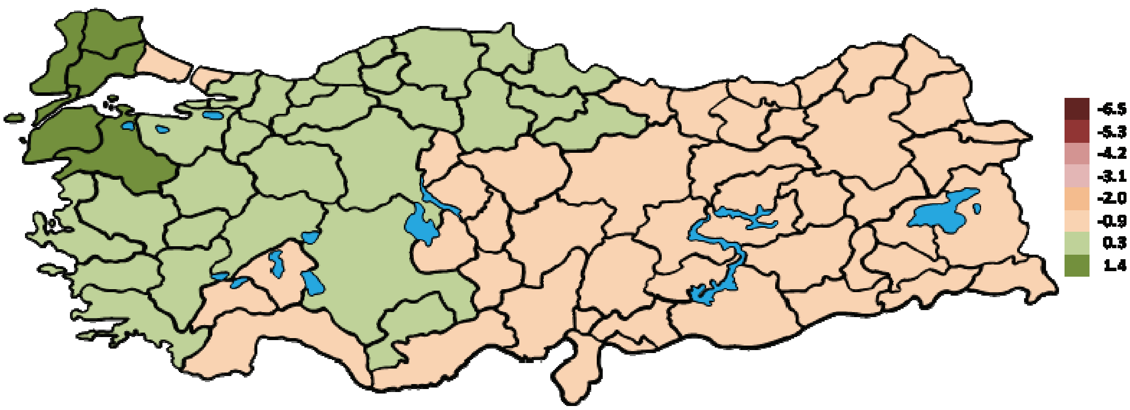
Scenario C: Scenario based on the results for 2085-2099



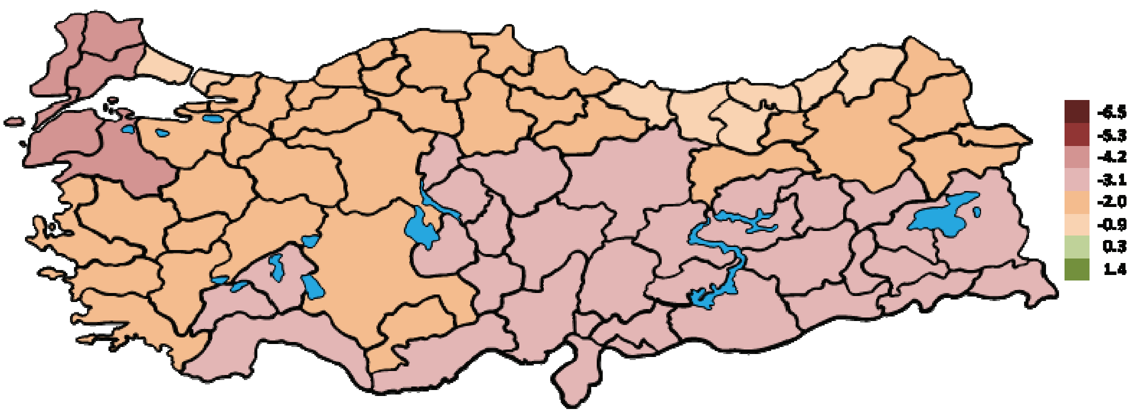
Source: Authors' calculations from CCST (2010)

Figure 2: Regional Production (base figures in value added units)

Scenario A:



Scenario B:



Scenario C:

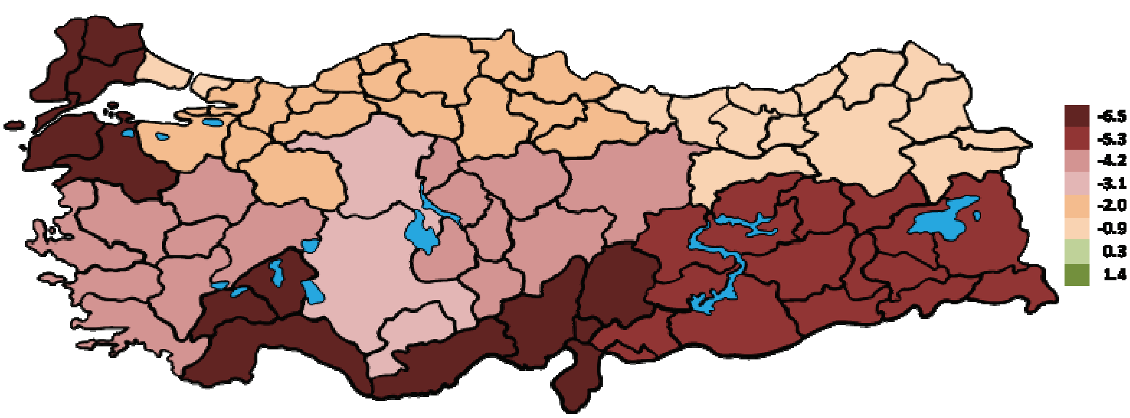


Table 1: Effects on GDP (base values at billion TL)

		Base	% Change		
		Level	Sc. A	Sc. B	Sc. C
Nominal	Total	839,343	0.44	-1.65	-3.06
	Agriculture	107,206	0.01	1.09	1.95
	Non-Agricultural	732,137	0.50	-2.05	-3.79
	Manufacturing	220,482	0.33	-1.63	-3.03
	Food Prod.	30,199	2.06	-6.42	-11.01
	Textile	34,859	0.60	-2.10	-3.67
	Oth. Manufacturing	155,424	-0.07	-0.59	-1.33
	Services	511,655	0.57	-2.23	-4.11
Real	Total	839,343	0.33	-1.37	-2.47
	Agriculture	107,206	2.23	-8.15	-14.49
	Non-Agricultural	732,137	0.05	-0.38	-0.71
	Manufacturing	220,482	-0.13	0.06	0.05
	Food Prod.	30,199	1.60	-4.82	-8.21
	Textile	34,859	0.06	-0.21	-0.25
	Oth. Manufacturing	155,424	-0.51	1.07	1.73
	Services	511,655	0.13	-0.57	-1.05

Table 2: Effects on Selected Aggregate Variables (Base values at billion TL)

		Base	% Change		
		Level	Sc. A	Sc. B	Sc. C
Real	Absorption	992,233	0.66	-2.31	-4.18
	Household Consumption	686,431	0.44	-1.48	-2.60
	Export	227,253	-0.67	1.68	2.91
	Import	269,388	0.64	-1.98	-3.52
	PPP Real Exchange Rate	100	-0.12	0.29	0.39
	Domestic Price Index	100	0.12	-0.29	-0.38
Ratio to GDP	Investment	22.1	0.3	-1.0	-1.8
	Private Saving	15.1	0.0	0.0	0.1
	Foreign Saving	5.3	0.3	-0.9	-1.6
	Trade Deficit	6.6	0.3	-0.9	-1.6
	Government Saving	1.7	0.0	-0.2	-0.3

Table 3: Household Income According to Regions (Base values at billion TL)

	Base	% Change		
	Level	Sc. A	Sc. B	Sc. C
TR1	193.719	0.54	-1.91	-3.39
TR2	39.514	1.25	-4.47	-8.17
TR3	109.557	0.65	-1.07	-2.74
TR4	81.540	0.51	-1.11	-1.17
TR5	81.999	0.40	-1.55	-2.96
TR6	94.753	0.19	-1.71	-3.80
TR7	36.200	0.28	-2.32	-3.51
TR8	44.254	0.12	-0.57	-0.69
TR9	27.318	-0.04	-0.76	-1.30
TRA	20.449	0.29	-0.67	-1.31
TRB	33.959	0.09	-0.55	-1.01
TRC	67.106	0.01	-1.17	-2.23
Turkey	830.368	0.41	-1.55	-2.87

Table 4: Selected Indicators for Agricultural Sector (base figures in value added units)

		Base	% Change		
		Level	**Sc. A**	**Sc. B**	**Sc. C**
Production		107,206	2.23	-8.15	-14.49
Employment	Capital	56,117	-0.41	2.94	5.53
	Labor	38,536	-0.41	2.92	5.51
	Land	10,182	-0.08	1.51	2.75
	Water	2,371	-0.08	1.51	2.75
Wages	Capital	1	0.38	-1.78	-3.19
	Labor	1	0.41	-1.77	-3.23
Trade	Imports	8,485	-2.75	21.28	51.51
	Exports	5,759	5.97	-24.56	-43.29
	Trade Deficit	2,726	-21.16	118.10	251.75
Prices		1.00	-2.17	10.07	19.22

Table 5: Selected Indicators for Food Production Sector (base figures in value added units)

Food Production		**Base**	**% Change**		
		Level	**Sc. A**	**Sc. B**	**Sc. C**
Production		30,199	1.60	-4.82	-8.21
Employment	Capital	21,218	1.59	-4.80	-8.19
	Labor	8,980	1.63	-4.87	-8.25
Wages	Capital	1	0.38	-1.78	-3.19
	Labor	1	0.41	-1.77	-3.23
Trade	Imports	5,101	-2.53	5.32	7.41
	Exports	9,310	5.99	-11.85	-15.49
	Trade Deficit	-4,209	16.31	-32.65	-43.24
Prices		1.00	0.45	-1.68	-3.06

Annex Tables

Table A1: Selected indicators for Energy Sector (base figures in value added units)

		Base Level	% Change Sc. A	Sc. B	Sc. C
Production		14,024	-0.12	0.28	0.51
Employment	Capital	10,800	-0.12	0.30	0.53
	Labor	3,224	-0.12	0.25	0.46
Wages	Capital	1	0.38	-1.78	-3.19
	Labor	1	0.41	-1.77	-3.23
Trade	Imports	20	0.29	-0.61	-0.49
	Exports	101	-1.05	2.54	3.35
	Trade Deficit	-81	-1.39	3.33	4.33
Prices		1.00	0.41	-1.73	-3.21

Table A2: Selected Indicators for Other Manufacturing Sector (base figures in value added units)

		Base Level	% Change Sc. A	Sc. B	Sc. C
Production		141,399	-0.55	1.14	1.85
Employment	Capital	73,739	-0.57	1.19	1.90
	Labor	67,661	-0.52	1.09	1.78
Wages	Capital	1	0.38	-1.78	-3.19
	Labor	1	0.41	-1.77	-3.23
Trade	Imports	229,058	0.71	-2.65	-5.13
	Exports	135,216	-1.50	3.74	5.88
	Trade Deficit	93,842	3.90	-11.84	-21.00
Prices		1.00	0.45	-1.63	-2.99

Table A3: Selected Indicators for Public Services Sector (base figures in value added units)

		Base Level	% Change Sc. A	Sc. B	Sc. C
Production		84,133	0.29	-1.06	-1.97
Employment	Capital	13,306	0.28	-0.99	-1.86
	Labor	70,827	0.30	-1.08	-2.00
Wages	Capital	1	0.38	-1.78	-3.19
	Labor	1	0.41	-1.77	-3.23
Trade	Imports				
	Exports				
	Trade Deficit				
Prices		1.00	0.39	-1.64	-3.06

Table A4: Selected Indicators for Private Services Sector (base figures in value added units)

		Base Level	% Change Sc. A	Sc. B	Sc. C
Production		427,522	0.10	-0.47	-0.86
Employment	Capital	308,817	0.09	-0.44	-0.82
	Labor	118,705	0.12	-0.54	-0.97
Wages	Capital	1	0.38	-1.78	-3.19
	Labor	1	0.41	-1.77	-3.23
Trade	Imports	36,683	1.38	-4.21	-7.73
	Exports	44,558	-0.65	1.96	3.69
	Trade Deficit	-7,875	-10.10	30.69	56.92
Prices		1.00	0.45	-1.68	-3.11

Table A5: Selected Indicators for Textile Sector (base figures in value added units)

		Base Level	% Change Sc. A	Sc. B	Sc. C
Production		34,859	0.06	-0.21	-0.25
Employment	Capital	22,141	0.05	-0.19	-0.23
	Labor	12,718	0.09	-0.25	-0.28
Wages	Capital	1	0.38	-1.78	-3.19
	Labor	1	0.41	-1.77	-3.23
Trade	Imports	11,052	0.65	-2.08	-3.48
	Exports	32,308	-0.30	1.27	2.94
	Trade Deficit	-21,256	-0.80	3.01	6.28
Prices		1.00	0.54	-1.89	-3.43