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ACCESSION TO THE EUROPEAN UNION: IMPLICATIONS FOR TURKISH AGRO-FOOD SECTORS

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ABSTRACT

Turkish relations with the European Union (EU) stretch back to 1959, although almost forty years later, Turkey still holds 'candidate' country status. Whilst serious accession talks began in 2005, there have been a series of political disagreements which have left Turkey's prospect of a smooth transition toward membership looking less than optimistic. The current political climate suggests that Turkish accession to the EU is not expected any time soon.

Focusing on the economic considerations from membership, quantitiative estimates from computable general equilibrium (CGE) studies in the applied literature unanimously predict considerable trade led gains to Turkey from EU accession. A unique feature of our study is that we focus on Turkey's agro-food sectors, where most of the remaining tariff barriers to trade are located. Furthermore, unlike the majority of current EU27 incumbents, agriculture remains a key part of the Turkish economy, both in terms of its share of Turkish GDP and employment.

Our estimates from accession are based on comparisons with a realistic long run 'baseline', whilst additional policy shocks are incorporated to examine the timely issue of east-west migratory flows on Turkish agro-food performance, and real income growth in Turkey, the EU27 and third countries.

Keywords: Turkey, European Union, Economic Integration, Agriculture and Food, Computable General Equilibrium (CGE) Models

TABLE OF CONTENTS

LIST OF TABLES

Page

LIST OF FIGURES

Page

Accession to the European Union:

Implications for Turkish agro-food sectors

I. Introduction

Turkey's relations with the European Union (EU) (nee European Economic Community) go back as far as 1959, when it made its first formal application for membership. In return, Turkey was granted associate member status under the Ankara Agreement in 1963. In 1987, Turkey formally reapplied for membership of the European Community (EC). The timing of this application was unfortunate in that the EC was redefining itself through the creation of a single market, whilst burgeoning expenditure on agricultural support rendered the assimilation of a 'large' agricultural economy such as Turkey, politically untenable. In January 1996, progress was made in the form of a Customs Union, which saw Turkey and the EU mutually abolish all quotas and tariffs on imports of industrial goods. Interestingly, agricultural products were not covered by the agreement, although a degree of agricultural trade takes place under the auspices of preferential agreements.

Forty years after making its initial approach to the EU, at the Helsinki European Council meeting, Turkey was finally recognised as an accession candidate, with negotiations opening some six years later, in 2005. However, Turkey's subsequent experience with the EU has been turbulent, with disagreements on both sides over the handling of sensitive issues such as trade links with Cyprus, the freedom of expression and human rights.

Furthermore, ideological divisions exist between incumbent EU member states on the geographical and religious compatibilities of incorporating Turkey within the EU.

In this study, we abstract from the ongoing political issues, to instead focus on the economic implications of Turkish accession. In light of the political delicacy surrounding the accession talks, the division of public opinion in both Turkey and the EU on Turkish accession, and the potential EU budgetary challenges from the assimilation of Turkey, we take the pragmatic view that Turkey will be a full EU member by 2025. Given the pace of trade reform between Turkey and the EU over the last forty years, this is seen as a plausible timescale.[1] A unique feature of our study is that we focus on Turkey's agro-food sectors, where most of the remaining tariff barriers to trade are located. Furthermore, unlike the majority of current EU-27 incumbents, agriculture remains a key part of the Turkish economy, both in terms of its share of Turkish GDP and employment.

To quantify the impact of the EU accession of Turkey, we employ the Global Trade Analysis Project (GTAP) database and accompanying multiregional computable general equilibrium (CGE) model. The CGE methodology has become the standard workhorse for assessing the impact of bilateral, regional and multilateral reform scenarios, whilst relevant EU market integration studies (i.e., EU enlargement) can be found in the literature (Jensen et al., 1998; Herok and Lotze, 2000; Jensen and Frandsen, 2003; Scrieciu and Blake, 2005).

In our experiment we run a baseline projecting the global economy to 2025, which is then compared with an accession scenario. In a further accession experiment, we include

[1] It is the opinion of the economist (2007a) that, "Nobody expects Turkey to join the EU before 2020".

further policy shocks to characterise the impacts of migratory flows from east to west.[2] As expected, trade creation gains outweigh trade diversionary losses such that accession yields real income gains to the Turkish economy, although with the inclusion of migratory 'losses' from Turkey to the EU, Turkish aggregate real income falls significantly, whilst per capita living standards rise due to the smaller population base.

The rest of this paper is structured as follows. Section 2 provides an overview of Turkey's economy and trade relations with the EU, with particular emphasis on the agro-food sectors. In section 3, we examine the relevant quantitative trade and policy literature to ascertain the range of real income gains to Turkey from accession. Section 4 discusses the methodology, data and experimental design, whilst section 5 describes the main results from our experiments. Section 6 compares our results with the literature and concludes.

II. The Turkish Economy

As a potential accession member, Turkey has a sizeable economic output. Indeed, in 2005 Turkish GDP was €290,5 billion, nearly 2,6% of the EU-25 level and 51,7% of the Accession Countries (AC-10). Notwithstanding, Turkey is considerably poorer than the EU-25 average (€23,500 - purchasing power parity) with an income per capita of €6,500, although it is comparable with recent accession members, Bulgaria and Romania. Notwithstanding, since the banking and currency crisis of 2001, economic reforms in Turkey have delivered an impressive growth record since 2002 (EUROSTAT, 2007), which is expected to continue for the foreseeable future (Economist, 2008).

[2] We are assuming that incumbent EU members do not impose labour restrictions on Turkish migrants.

From a trade perspective, the EU is the principal partner for Turkey, particularly in agro-food products. The EU-25 accounts for approximately 52% of Turkey's total agricultural exports and 31% of total agricultural imports (European Commission, 2006). Given that the current customs union agreement between Turkey and the EU does not include agricultural products, further EU integration in the form of free agricultural trade would imply notable trade creation and diversion effects. Given strong trade links with the EU, conventional wisdom would suggest that Turkish trade creation would prevail resulting in higher economic growth in Turkey (see section 3).

(%)	Turkey	AC-2	AC-10	EU-15	EU-27
Agric. share of national GDP	9,2	14,2	3,5	1,6	2,0
Food share of national GDP	6,7	13,5	9,0	5,1	5,4
Agro-food share of national GDP	15,9	27,8	12,5	6,7	7,4
Agro-food imports in total imports	5,9	7,0	6,0	7,6	7,5
Agro-food exports in total exports	8,6	5,4	5,5	6,9	6,8
Agro-food. imports in total EU-27 imports	1,3	0,9	5,5	93,7	100
Agro-food exports in total EU-27 exports	2,1	0,6	4,9	94,5	100
Agric. share of production (EU-28 = 100)	6,9	11,2	8,7	73,2	93,1
Food share of production (EU-28 = 100)	1,9	4,1	8,5	85,5	98,1
Agro-food share of production (EU-28 = 100)	3,3	6,0	8,5	82,1	96,7

Table 1. 2001 comparative descriptive statistics for agriculture and food
Source: GTAP version 6, Dimaranan (2006)

Table 1 shows summary statistics from the GTAP database relating to the importance of agro-food activities in Turkey. Thus, agro-food production in Turkey constitutes 3.3% of EU-28 (EU-27 plus Turkey) production, 6.9% of primary agricultural production and 1.9% of processed food production. European Commission figures for 2005 (European Commission, 2006) show that in no other state, (except Romania), does agriculture have such an important role as in Turkey which accounts for 11.1% of national GDP compared

with the corresponding EU-25 average of 1.6%. Meanwhile, national statistics (TURKSTAT, 2006) reveal that the share of agriculture in GDP and total employment has declined between 1970 and 2005 (36.7% to 10.1% and 60% to 29.5%, respectively), although still remains way above the EU average.[3]

Finally, in terms of external trade relations, Turkey typically has a positive trade balance in agricultural products. In 2004, Turkey exported and imported €4.8billion and €3.5billion of agro-food products respectively, whilst 9.5% and 4.5% of Turkish exports and imports respectively, were attributed to agro-food products (TUSIAD, 2005). Once again, these figures are relatively close to the GTAP database statistics provided in Table 1.

III. Literature Review

A review of recent quantitative trade studies reveals several CGE studies on market integration between Turkey and the EU. In one study, Bekmez (2002) employs a Turkish social accounting matrix for 1995 to construct a CGE model of the Turkish economy with 22 sectors (including a single agricultural sector and a single food processing sector). Various trade policy options are covered including unilateral removal of Turkish manufacturing tariffs on EU imports; full membership of the EU through tariff eliminations and extension of the common external tariff (CET) to Turkey on 'third' countries; and unilateral removal of Turkish tariffs on all trading partners. In all cases, Turkey records welfare gains, whilst the largest benefit occurs under full membership.

[3] Both sources are relatively close to the GTAP data estimates, whilst discrepancies may occur due to different years and different definitions of the 'agriculture' sector.

Zahariadis (2005) investigates the economic implications from 'traditional' and 'deep' integration to a customs union (CU) between Turkey and the EU-15. The latter is characterised by exogenous productivity shocks from the adoption of EU regulations and standards (additional costs) and its related medium to long run efficiency costs (additional benefits). In addition, the author includes agriculture within the CU through tariff eliminations on EU-Turkish trade. The study employs version 5 of the GTAP data (benchmarked to 1997) with an aggregation of 9 regions and 20 sectors (including 4 'aggregate' agricultural sectors). Under traditional integration scenarios, Turkey realises real income (equivalent variation – EV) gains of between US$480 m to US$1.4 billion in 1997 prices. Deeper integration scenarios also bestow welfare gains to Turkey, although these are muted in comparison to the 'traditional' integration scenarios (up to $1bn.) since Turkey must bear the additional costs of adopting EU technical and product regulations.

Lejour et al. (2004) analyse three main issues linked with Turkish membership: accession to the internal European Market; institutional reform in Turkey initiated by EU-membership; and migration in response to the free movement of workers. The authors utilise a CGE model for the world economy called 'Worldscan', calibrated to the GTAP version 6 database. The data is aggregated to 16 regions including good coverage of the EU-27 and 20 sectors including 1 agricultural and 1 food processing sector. The authors develop a status quo baseline to 2025 capturing projections on factor endowments, population, growth, the EU accessions of 2004 and 2007, and the completion of the international agreement on textiles and clothing (ATC agreement). As in Zahariadis (2005), the authors investigate forms of deep integration, although improve on the former study by econometrically estimating potential trade and productivity gains from the removal of non-

tariff barriers (NTBs) and Turkish institutional reform triggered by EU membership. In addition, the authors examine the impacts of migratory flows between Turkey and the EU following accession. The impacts of these scenarios are compared with the baseline.

Deep integration to the internal market raises Turkish real income (EV) by US$4.4 billion while GDP rises by about 0.8 per cent in the long run, whilst also having a small positive effect on the EU-15 and AC-10. That the EV estimates for Turkey are significantly larger than those of Zahariadis (2005), are largely attributed to greater estimates of productivity gains from the econometric specification. With 'institutional reform', Turkey is estimated to gain US$28.2 billion with a concurrent GDP increase of 5.6 per cent compared with the baseline. Finally, examining the impact of migratory outflows from Turkey to the EU, Turkish GDP declines by between 1.8 per cent and 2.2 per cent while in the EU-15 GDP increases by between 0.5 per cent and 0.7 per cent. Interestingly, income per capita rises in Turkey as the outflow of people is smaller than the increase in GDP from integration. This is because the labour/capital ratio in Turkey rises resulting in greater labour productivity and consequently higher wages.

Finally, in a recent study, Sulamaa and Widgrén (2007) employ the GTAP model and version 6 database to analyse Turkish membership of the EU25 under different forms of market structure. The study employs 8 regions and 15 sectors, although only one agro- food sector is included. The authors run three scenarios comparing perfect competition, imperfect competition with no entry of firms (scale economies and positive profits) and imperfect competition with free entry of firms (scale economies and zero profits). Under the standard assumption of perfect competition, Turkey makes an EV gain of US$300 million, whilst the

additional welfare gains from the reduction in mark-ups and scale economies due to the removal of protection predictably yields even greater gains.

To summarise, the consensus of the literature is that Turkey stands to gain significantly from free access to the EU as trade creation exceeds trade diversion. Indeed, in the context of the descriptive trade statistics presented in section 2, this is not surprising. On the other hand, empirical analysis shows that estimates of trade led gains are highly variable (between US$0.3bn to €28.2bn) due to the welfare boosting impacts of efficiency gains (from the harmonization of products standards, removal of NTBs, institutional reform etc.) and increased competition (lower mark-ups and scale economies). In addition, the usage of various benchmark years implies a different composition of tariffs resulting in differing welfare estimates, whilst the basis of comparison across the studies also changes in those studies that employ baselines. Accordingly, with a broad range of (in some cases ad hoc) modelling assumptions and scenario designs, it is not really plausible to think in terms of a single estimate, but rather a range of estimates.

IV. Methodology, Data and Experimental Design

IV.1. GTAP Model

To characterise consumer demands, neoclassical utility maximisation is employed to determine three types of 'regional household'.[4] Thus, in the model, a Cobb-Douglas (CD) utility function for region 'r' consists of private consumer demands (UP_r), government (or

[4] The regional household is a 'representative' accounting entity designed to encompass the activities of all individuals in each region (i.e., consumers, businessmen (investors and ownership of factors), government activity (tax and spend) etc.). As is typical in CGE, the regional household accrues income from ownership of the factors of production and the collection of net tax revenues.

public) consumer demands (UG_r) and savings (investment demands) ($USAVE_r$), where α, β and δ are elasticities.:

$$U_r = UP_r^{\alpha} UG_r^{\beta} USAVE_r^{\delta} \qquad (1)$$

Maximising (1) subject to the regional budget constraint, yields CD Marshallian aggregate demands in each region 'r' by each agent:

$$UP_r = \frac{Y_r}{PPRIV_r}\alpha \quad UG_r = \frac{Y_r}{PGOV_r}\beta \quad USAVE_r = \frac{Y_r}{PSAVE_r}\delta \qquad (2)$$

Weak homothetic separability assumptions are employed to further partition aggregate private and public consumer decisions into 'nests' (multi-stage budgeting) based on conventional neo-classical behaviour (cost minimisation). Thus, at the second level of the nest, *private* expenditures are minimised subject to a non-homothetic constant difference in elasticities (CDE) function[5] to derive Hicksian demands for each commodity 'i'. At the third layer of the nest, private expenditure on each commodity 'i' is minimised subject to a constant elasticity of substitution (CES) function to yield Hicksian commodity demands by origin (i.e., domestic vs. 'composite' import demands). Finally, CES expenditure minimisation yields bilateral import demands by region of origin at the fourth level of the

[5] The CDE function allows the modeller to calibrate differing price and income elasticities which offer a much richer characterisation of final demands than the standard Cobb-Douglas (CD) or CES functions.

nest.[6] Public expenditure has the same nesting structure, although in the second level of the nest, a semi-flexible CDE function is employed.

The production structure is also nested, where in the top nest, Hicksian cost minimisation apportions Leontief demands by composite value added and intermediate inputs. Cost minimisation also determines CES demands for factors of production within the value added nest, whilst the derivation of intermediate input demands into domestic and composite imports (nest level 2), and imports by region of origin (nest level 3) follows the same CES treatment as the consumption nested structure.

Production activities are characterised as perfectly competitive and constant returns to scale, whilst supply by each sector is 'demand driven' employing zero profit equations (i.e., supply equals final demand).[7] Thus, value of production of good 'j' in region 'r' ($VOA_{j,r}$) is determined by total primary factor and intermediate input demand costs by using sector 'j' in region 'r' ($VFA_{i,j,r}$).

$$VOA_{j,r} = \sum_{i \in fact} VFA_{i,j,r} + \sum_{i \in \text{int}} VFA_{i,j,r} \qquad (3)$$

Within each region, the GTAP model distinguishes between primary factors 'i', that are perfectly mobile across sectors and those that are sluggish[8]. To characterise a sluggish factor the model employs a single nested Constant Elasticity of Transformation (CET) function:

[6] This level is also known as the Armington specification which permits two-way trade in otherwise homogeneous products through use of the elasticity of substitution between competing products.
[7] In GTAP there are no explicit supply functions for goods and services.
[8] Given that the study focuses on the long-term effects, full employment and perfect mobility in all labour and capital markets is assumed (land and natural resources are assumed to be sluggish).

$$QO_{i,r} = A_{i,r}\left[\sum_{j\in prod}\delta_{i,j,r}QOES_{i,j,r}^{\rho}\right]^{\frac{1}{\rho_i}} \quad (4)$$

where $\delta_{i,j,r}$ is a CET share parameter; $A_{i,r}$ is a scale parameter; and ρ_i is an elasticity parameter. The price of each mobile factor is specified by a single regional market clearing equation (i.e., the sum over all usage of the primary factors is equal to regional supply), such that the price is uniform across all using sectors 'j' within a region 'r' (perfect factor mobility). In the case of a sluggish factor, there is no single price to clear aggregate factor markets. Therefore, to maintain equilibrium, marketing clearing equations between sluggish factor demands ($QFE_{i,j,r}$) and supplies ($QOES_{i,j,r}$) are implemented for each using sector 'j':

$$QFE_{i,j,r} = QOES_{i,j,r} \quad (5)$$

To apportion investment demands (i.e., regional savings) across regions, GTAP employs a fictitious agent, known as the 'global bank', which collects global investment funds (all regions' savings) and disburses them to each region based on fixed regional investment shares. Assuming all domestic and trade markets clear, the supply of global capital/investment goods (WALRAS_SUP) must be equal to the sum of all savings demands (WALRAS_DEM), thereby satisfying Walras' law.

To ensure a general equilibrium, a large system of market clearing equations are implemented to guarantee that all factor, input and commodity markets clear (i.e., demand equals supply). Moreover, accounting identities ensure that regional households and producers remain on their budget and cost constraints respectively, household expenditures

equal household incomes (i.e., tax/tariff revenues and ownership of factors of production), and that long-run zero profits prevail in all production sectors.

Once the model structure is formalised and calibrated to the chosen data aggregation, specific macroeconomic or trade policy scenario questions can be addressed by imposing exogenous shocks to key policy variables (i.e., changes to tax/subsidy rates, primary factor supplies, technical change variables etc.). The model responds with the interaction of economic agents within each market, where an outcome is characterised by a new series of equilibrium conditions.

IV.2. GTAP data aggregation

In this study we employ version 6 of the GTAP database (Dimaranan, 2006), benchmarked to 2001. To keep the model within computational limits and focus on the issues of interest the data is aggregated into 13 regions/countries and 21 sectors. Regional and sectoral aggregations are shown in Figure 1. We separate a number of EU countries based on their trade importance with Turkey, whilst the remaining EU members are collapsed into composite regions (see Figure 1). The non-EU regions are made up of the USA, whilst the ROW region captures residual production and trade flows. Given the focus on the agro-food sectors in Turkey, we disaggregate all 18 agro-food sectors from the data, whilst the remaining non-food sectors are grouped into 'raw materials', 'manufacturing' and 'services'. To simplify the presentation of the results, aside from Turkey, results are presented for the 'old' EU members (EU-15), the recent accession members (AC-12) and the non EU regions (ROW)

I. Chosen Sectoral Aggregation (21 GTAP sectors in bold)

1.Wheat - Soft and durum wheat; **2.Other Grains** (Ograins) - Maize, barley, rye, oats, other cereals; **3.Vegetables, Fruit and Nuts** (VegFruitNuts) - Potato, peas, cauliflower, tomato, pulses, other vegetables, nuts, olives, onions, apple, pears and peaches, bananas, other fruits, citrus fruits; **4.Oilseeds** - Sunflower seed, olive for oil, soya beans, cotton seed, sesame seed, rape and mustard seed; **5.Sugar** - Sugar cane, sugar beet; **6.Plant-based fibers** (Plants) - Raw vegetable materials used in textiles; **7.Other crops** (Ocrops) - Cut flowers and flower buds; flower, fruit an vegetable seeds; beverage and spice crops; tobacco; food fed to livestock (straw, hay, alfalfa, clover, lupines, vetches and similar forage plants); sugar beet seeds and seeds of forage plants; other raw vegetable materials; **8.Cattle and Sheep** (Catshp) - Bovine cattle, sheep, goats, horses, asses, mules and hinnies for fattening; **9. Pigs and Poultry** (Pigspoultry) - Pigs for fattening, laying hens, poultry for fattening, other animals (frog, snail etc.), hides and skins; **10. Raw milk** (RawMilk) - Dairy cows and other cows; **11. Other Agriculture** (Oagric) - Paddy rice, wool, silk-worm cocoons; **12. Meat processing** (Meatpro) - Meat products (bovine, sheep, goat, horses and mules); **13. Other meat processing** (Omeatpro) - Eggs and egg products, meat products (pigs, poultry); **14. Vegetable oils and fats** (Vegailsfats) - Coconut oil, cottonseed oil, groundnut oils, oilseed oils, olive oil, palmkernel oils, rice bran oils, rape and mustard oils, soyabean oil, sunflower seed oils, maize oils animal or vegetable fats and oils, margarine and similar products; **15. Dairy** - Butter, cheese, cream, whey and products, skimmed milk; **16. Sugar processing** - Refined sugar, sweeteners; **17. Other food processing** (Ofoodpro) - Processed rice; sea food products; processed vegetables and fruits; fruit and vegetable juices; flour (wheat and other cereals); starches and starch products; bakery products; cocoa, chocolate and sugar confectionery; farinaceous products (macaroni, noodles etc.); **18. Beverages and Tobacco** (BevsTobac) - Cigarettes, cigars etc., wines and spirits, beer; **19. Raw materials** (RawMat) - Coal, oil, gas, minerals, petroleum and coal products, forestry, fishing; **20. Manufacturing** (Mnfcs) - Textiles; wearing apparel; leather products; wood products; paper products and publishing; chemical, rubber and plastic products; ferrous metals; other metal products; motor vehicles and parts; transport equipment; electronic equipment; machinery and parts; **21. Services** (Svces) - Utilities (Gas, water, electricity); construction; trade services; transport (air, sea, road); communications; other financial services; insurance; other business services; recreation and other services; dwellings; public administration/defence/health/education.

II. Chosen Regional Aggregation (13 GTAP Regions in bold)

1. Turkey, 2. France, 3. Germany, 4. Greece, 5. Italy, 6. The Netherlands (NL), **7. Spain, 8. United Kingdom** (UK), **9. Rest of EU-15** (Austria, Belgium, Denmark, Finland, Ireland, Luxembourg, Portugal, Sweden), **10. AC-10** (Czech Republic, Cyprus, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia), **11. AC-2** (Bulgaria, Romania), **12. USA, 13. Rest of the World**.

Figure 1: GTAP Data Aggregation

IV.3. Experimental Design

In our study we construct a plausible long-run 'status quo' baseline projected from the benchmark year (2001) to 2025 against which the accession scenarios are compared. The assumptions shaping the baseline are described in Figure 2. Projections for growth, the labour endowment and total factor productivity for all regions, except Turkey, are taken from Jensen and Frandsen (2003), whilst population growth rates are calculated from the UN World Population Division (2007). Capital endowment growth is determined

endogenously within GTAP given knowledge of the exogenous shocks to the endowments, growth, productivity and population. In the case of Turkey, the annual growth rate of GDP is obtained from a recent study by Bergheim (2005), whilst labour projections are based on the growth rates of the total skilled and unskilled labour stock in Turkey over the period 1995 to 2000 employing data on educational attainment provided by Barro and Lee (2000).[9]

Baseline Scenario Assumptions: 2001-2025

Projections

Shocks to GDP, total population, factor endowments, productivity

Trade Policy Shocks

Implementation of Uruguay Round and other commitments (including Chinese accession)
Import tariff reductions for developed and developing countries under the Doha Round.
Elimination of export subsidies for all products in all countries under the Doha Round.
Removal of all EU-27-Turkish non agro-food Tariffs under the Customs Union agreement with the EU

EU Enlargement

Elimination of all border protection (i.e., import tariffs, export subsidies) between old and new member states (including Romania and Bulgaria)
Impose common external tariff for all 12 new EU member states (2004 and 2007 accessions)

Agricultural domestic support

Elimination of agricultural support (output - input subsidies and land – capital based payments) in all countries

Figure 2. Assumptions shaping the baseline 2001 – 2025

The baseline also incorporates foreseeable trade policy developments including a stylized Doha Round representation. Although an agreement on tariffs has not yet been reached, recent work by Jean et al. (2005) provides a series of tariff harmonization formulas for developed and less developed members, which explore and enumerate a range of plausible multilateral tariff reform alternatives. Two attractive policy features to this work are that (i) calculated tariff reductions take account of the tariff binding overhang between the bound rate and the applied tariff rates employed in GTAP, and (ii) the tariff liberalization

[9] This data includes the stock of human capital for every schooling level for approximately one hundred countries. These levels are: no education, primary, secondary and higher education. Following the same approach used by Jensen et al. (1998) and CPB (1999) skilled labour is characterised as those who have secondary or higher education.

shocks also account for concessions on 'sensitive' product tariff reductions.[10] Finally, in the context of the agreement reached at the Hong Kong summit in December 2005, all export subsidies are eliminated.

Under the auspices of the WTO, domestic support is classified by the extent to which it is decoupled from domestic production, and consequently trade. The rhetoric on domestic support reform is clear in that Amber Box (trade distorting support) is to be reduced dramatically and blue box (partially decoupled support schemes) will face reduced ceiling limits, whilst the challenge to the EU and US will be to demonstrate that the majority of their support programs are completely decoupled from production (Green Box) and thereby exempt from WTO disciplines. In addition, within the current 'CAP (Common Agricultural Policy) Health Check' proposals, more domestic support is to be moved toward non-market 'pillar two' funding through increased modulation. In the context of this ongoing policy shift, we remove all domestic support wedges in the GTAP database, where we implicitly assume that by 2025, all domestic support will be decoupled.[11]

In comparison with the baseline, two alternative accession scenarios are examined. Given the uncertainty surrounding Turkey's potential membership, we use a working assumption that by 2025, Turkey will be fully integrated into the EU. In scenario 1 we remove all remaining agro-food tariffs between the EU and Turkey and erect an EU-27 average CET for all Turkish sectors on third country trade. In scenario 2, we follow Lejour

[10] For further information on the tariff harmonization formula see Jean et al., (2005).

[11] By assuming that all support is decoupled, we are not taking into account the possibility that 'non-price' determinants (i.e., the associated wealth effects on risk aversion from decoupled transfer payments) may render even so-called decoupled payments as potentially production distorting. In addition, whilst it is likely that some form of pillar 2 CAP payments will remain in place in 2025, we have not attempted to include any CAP budget mechanism since it is likely to be reformed considerably before Turkey's accession to the EU and consequently, there is considerable uncertainty on what the size of these allocations will be.

et al. (2004) by incorporating migration flows from Turkey to the EU.[12] Assuming open labour markets, the European Commission (2004) notes that between 0.5 and 4.4 million Turks would migrate to the EU in the wake of accession. In the context of these estimates, we follow a central estimate of 2.7 million proposed in Lejour et al. (2004), which they base on historical immigration patterns and the income differentials between the EU and Turkey. The migration flows are distributed across EU countries assuming that new migrants go to countries where previous migrants have settled. For example, Table 2 shows that 8% of Turkish migrants are assumed to settle in France.

		S 2.1 (In 1000)	S 2.2 (In 1000)	
Countries	**% of total**	**Unskilled**	**Skilled**	**Unskilled**
France	8	216	58	158
Germany	76	2052	554	1498
Greece	3	77	21	56
Italy	1	27	7	20
Netherlands	4	108	29	79
UK	2	54	14	39
Rest of the EU-15	6	166	45	121
Total	100	2700	729	1971

Table 2. Expected number and destination of Turkish migrants

Source: Barro and Lee (2000), Lejour et al. (2004), OECD, (2007) and own calculations

Importantly, Borjas (1999) notes that the economic effect of migration for the host countries and the countries of origin also depends on the skill level of the migrants. Since it is difficult to know the skill composition of any hypothetical Turkish migration in the post accession period, two simulations with different assumptions on migrant skill level are

[12] In our review of the literature, we felt that the migration issue was the most empirically sound modelling feature. Estimates of potential productivity gains from institutional reform, or non tariff barrier (NTB) elimination boost the welfare gains to the extent that it is difficult to be sure that the shocks are a correct reflection of 'intangible' hidden costs from EU membership. In addition, migration is currently a hot topic of debate within the EU, particularly in Germany and Austria, where it is envisaged a majority of the Turkish workers would reside.

performed. Under the first simulation (scenario 2.1), it is assumed that all 2.7 million Turkish migrants are unskilled, whilst in the second simulation (scenario 2.2) it is assumed that the composition of Turkish migrants is equal to the composition of the Turkish population in the year 2000. To implement these additional policy shocks into the model, slight adjustments are made to the skilled and unskilled labour endowments and the population variables in comparison with the baseline shocks.

V. Results

V.1 Overview

Given the plethora of tariff changes occurring in each sector of the model, the task of results interpretation is far from straightforward. Moreover, the sectoral and regional decomposition of this model aggregation makes a full discussion of the results unwieldy. Accordingly, we limit our discussion to the incremental impacts from scenarios 1 and 2 on the Turkish economy. Where possible, we aggregate select results for the remaining regions into the 'old' EU regions (EU-15), the recent accession regions (AC-12), and the remaining non-EU regions (ROW).

In the baseline, we eliminate agricultural pillar 1 support, export subsidies and non agro-food EU-Turkish import tariffs. This implies that trade led growth and income effects under policy scenarios 1 and 2 (2.1 and 2.2) are motivated by simultaneous reductions in bilateral EU-27-Turkish tariffs. With greater import penetration, there are concurrent impacts on primary resource reallocations between competing domestic sectors. On a sectoral basis, the magnitude of this effect is influenced by comparative rates of trade competitiveness (tariff rate) between Turkey and the EU, the trade dependency of the region

and the responsiveness of import demands to relative price changes (influenced by the armington substitution elasticity). In addition, Turkey faces changes in third country tariffs through the implementation of the CET, which cause trade diversionary impacts. The extent to which trade creation and diversion effects prevail is ascertained through the resulting impact on real income (equivalent variation).

V.2 Turkish Output, Market Prices and Trade Balances

In Table 3, we show long run estimates of changes in Turkish output, market prices and trade balances for the Turkish economy in scenarios 1, 2.1 and 2.2, relative to the baseline. Expansions in Turkish agro-food output indicate relative competitiveness in Turkey, particularly since the EU-27 has already eliminated Pillar 1 domestic support and agricultural export subsidies in the baseline.[13] With greater agro-food output in Turkey, primary factors move away from non agro-food sectors (i.e., manufacturing and services) resulting in output reductions relative to the baseline.

Notably, in scenario 1, all downstream food sectors witness increases in output from accession to the EU. The largest increases in Turkish agro-food output occur in the 'meat processing' (88,1%), 'other meat processing' (60,6%) and 'vegetable oils and fats' (44,7%) sectors.[14] In the upstream livestock (including 'raw milk'), 'oilseeds' and 'raw sugar' sectors production increases as a result of higher intermediate demand from downstream 'meat' sectors, 'vegetable oils and fats' and 'sugar processing'. In some sectors, ('other crops',

[13] In the GTAP database, the EU-15 accounts for approximately 90% of all subsidies on agricultural exports.
[14] The reader should, however, be aware that these percentage increases are calculated from a smaller base in the case of these three sectors.

'wheat' and 'plant-based fibres') accession leads to production falls (-9,3%, -2,6%, -0,2% respectively). In the case of 'other crops', production is negatively affected by the reduction of the Turkish tariff on US imports under the CET, whilst the production fall in 'wheat' is due to greater trade competitiveness in the EU.

	Output (%)			Market Prices (%)			Trade Balance (€m 2001)		
Sectors	**S 1**	**S 2.1**	**S 2.2**	**S 1**	**S 2.1**	**S 2.2**	**S 1**	**S 2.1**	**S 2.2**
Wheat	-2,6	-2,9	-2,5	0,5	-	-0,1	-170	-141	-132
Ograins	1,7	0,2	0,4	1,6	1,0	0,8	-48	-44	-44
VegFruitNuts	-	-1,6	-1,4	1,3	0,7	0,4	-57	-24	-10
Oilseeds	7,7	6,4	6,7	3,7	2,8	2,7	-74	-64	-64
Sugar	9,2	7,3	7,4	3,7	2,9	2,7	0	0	0
Plants	-0,2	-1,6	-1,4	0,7	0,3	0,2	-52	-30	-29
Ocrops	-9,3	-10,0	-9,4	-1,8	-2,1	-2,2	-303	-277	-266
Catshp	11,8	10,0	10,2	1,7	1,0	0,8	-29	-27	-26
PigsPoultry	6,6	4,8	5,1	0,6	-0,1	-0,2	-121	-111	-112
RawMilk	0,6	-1,1	-0,9	-0,2	-0,8	-0,9	0	1	2
Oagric	-	1,1	1,5	0,3	-0,3	-0,3	-27	-19	-19
Meatpro	88,1	85,9	86,3	0,5	0,7	0,7	1135	1126	1129
Omeatpro	60,6	56,6	57,5	0,4	0,6	0,6	534	513	519
Vegoilsfats	44,7	41,7	41,9	0,3	0,7	0,7	1013	986	989
Dairy	2,1	0,2	0,3	-0,1	0,1	+	135	132	134
Sugarpro	9,1	7,3	7,3	0,4	0,8	0,7	700	709	709
Ofoodpro	3,0	1,9	2,0	-1,4	-1,3	-1,3	46	55	57
BevsTobac	2,4	0,6	0,6	-7,7	-7,6	-7,6	7	13	13
RawMat	-	-0,1	-0,1	+	-0,3	-0,3	500	1860	1789
Mnfcs	-1,8	-4,5	-4,3	0,3	0,6	0,6	-2306	-3758	-3559
Svces	-0,2	-1,9	-2,0	0,7	1,3	1,4	-799	-1161	-1318
Total							**83**	**-260**	**-238**

Table 3. Changes in Turkish output, Market Prices and Trade Balances compared with the baseline

Note: +/- indicates less than + or - 0,1 %

Turkey's largest agricultural sector, 'vegetables fruits and nuts', undergoes very little change in production from accession.[15] On the one hand, this is explained by low levels of EU-15 import protection limiting opportunities for export led growth. On the other hand, Turkish imports of 'vegetables, fruits and nuts' are minor as a proportion of domestic demand, such that import penetration only yields a modest impact on domestic production.

In scenarios 2.1 and 2.2, the inclusion of 2.7 million Turkish migrants to the EU has an expected dampening effect on production in Turkey. Indeed, production in all sectors falls relative to scenario 1 due to lower supplies of skilled (only in scenario 2.2) and unskilled workers (Rybczynski theorem). Indeed, notable percentage point drop-offs compared with scenario 1 are recorded in the large sectors of 'manufacturing' and 'services', whilst in the primary agricultural sectors, 'vegetables fruits and nuts', 'other grains', and livestock sectors (including raw milk) suffer most from the exodus of farm labour. A closer examination of scenarios 2.1 and 2.2 shows, that production falls are larger in the former case. This is traced back to the differing assumptions pertaining to the skill composition of the migrants. If all migrants are assumed to be unskilled (scenario 2.1) falls in the production of all sectors are greater due to the relatively higher intensity of unskilled labour in all sectors, especially in the primary agricultural sectors. The only exception occurs in the 'services' industry, which is more intensive in skilled labour.

Table 4 provides the percentage changes on returns to land, capital, both labour types and natural resources and the regional index of factor prices (pfactor) in Turkey relative to the baseline. Expansion of most agricultural sectors following Turkish accession to the EU

[15] According to the baseline nearly 64% of all exported products of this sector from Turkey are bought by the EU.

(scenario 1) bids up the price of primary factor prices. Indeed, factor price rises outweigh the reductions in imported intermediate inputs from tariff eliminations, resulting in market price increases (see Table 3). In scenarios 2.1 and 2.2 the contraction of all sectors relative to scenario 1 leads to reductions in land and capital prices relative to scenario 1. By contrast, increased scarcity of unskilled and skilled labour (only for scenario 2.2) due to migratory effects, lead to notable wage increases. Accordingly, factor price changes have market price impacts in Table 3. Given the high intensity of land usage in primary agriculture,[16] market prices in these sectors fall relative to scenario 1. In the remaining processed food, manufacturing and services sectors, market prices rise relative to scenario 1 from increased labour costs. Importantly, with the exception of the service sector, market prices fall in scenario 2.2 compared with scenario 2.1 due to the relatively higher intensity of unskilled labour in production. In services, skilled labour has a greater intensity implying higher market price rises in scenario 2.2.

Factor of Production	S 1	S 2.1	S 2.2
Land	2,1	-4,3	-3,6
Unskilled Labour	1,2	5,4	4,1
Skilled Labour	1,0	0,5	3,5
Capital	1,0	0,4	0,5
Natural Resources	-0,2	-1,1	-1,0
Pfactor	1,0	1,6	1,6

Table 4: Changes in Turkish factor prices (%) compared with the baseline

In terms of the trade balances, the output increases in scenario 1 in Turkish food processing sectors result in trade balance improvements (Table 3). Primary agricultural trade balances deteriorate despite sectoral output improvements. This is because 'upstream'

[16] Note that in GTAP, the land factor is specific to the primary agricultural sectors.

agricultural output increases are motivated by increases in 'downstream' intermediate demands rather than trade demand increases. Overall, Turkey's aggregate agro-food trade balance improves significantly by €2,688 million compared to the baseline, although concomitant contractions in non-food activities result in a moderate aggregate trade balance improvement of €83 million compared with the baseline.

Under the scenarios 2.1 and 2.2 Turkish imports fall relative to scenario 1 owing to migratory outflows from Turkey to the EU resulting in lower regional income (see section V.3) and final demand. Equally, production (and consequently exports) falls in Turkey from the exodus of labour, particularly in the manufacturing and services sectors. Overall, Table 3 shows that Turkey's aggregate trade balance declines between -€ 238 m (scenario 2.2) to -€ 260 m (scenario 2.1) compared with the baseline. Higher production falls in nearly in all sectors under the scenario 2.1 result in greater import substitution and consequently a larger deterioration in the aggregate trade balance, compared to scenario 2.2.

V.3. Macroeconomic (Welfare Effects)

The welfare results of accession scenarios 1 and 2 for Turkey, EU-15, AC-12 and ROW are shown in Table 5. The underlying changes in welfare are measured as an equivalent variation (EV)[17] summary statistic. Subsequently, total EV is decomposed into allocative efficiency effects, terms of trade (ToT) effects and 'other' effects. Allocative efficiency is measured as the value of changes in resource or product usage from policy shocks imposed on a given market distortion (i.e., tax/tariff or subsidy). For example, a tariff

[17] The equivalent variation (EV) is a measure of welfare change measured as the income given (or taken away) in '*pre-shock*' regional prices (i.e., money metric measure), which is equivalent to the utility in national welfare that follows from the Turkey's accession.

on a product implies an under usage of resources as the economy is employing less compared with free or undistorted market forces. Conversely, subsidies encourage over-production compared with free market conditions and therefore constitute a misuse of resources (Huff and Hertel, 2000). Thus, activities which are taxed (subsidized) have a positive (negative) marginal social value. It therefore follows that increasing (decreasing) the level of a relatively highly taxed (subsidized) activity results in an efficiency gain.

S 1	**Turkey**	**EU-15**	**AC-12**	**ROW**
Per capita utility (%)	0,243	-0,001	0,004	0,000
Equivalent variation (€ m)	752	-204	22	760
Of which:				
Allocative efficiency (€ m)	-72	215	338	285
ToT (€ m)	443	-284	-302	105
Other effects (€ m)	381	-135	-14	370
S 2.1	**Turkey**	**EU-15**	**AC-12**	**ROW**
Per capita utility (%)	1,445	0,462	0,072	0,013
Equivalent variation (€ m)	-5018	158422	663	6579
Of which:				
Allocative efficiency (€ m)	129	45486	312	-35
ToT (€ m)	1975	-9249	344	7841
Other effects (€ m)	-7122	122185	7	-1227
S 2.2	**Turkey**	**EU-15**	**AC-12**	**ROW**
Per capita utility (%)	1,515	0,240	0,071	0,010
Equivalent variation (€ m)	-4811	128119	530	5317
Of which:				
Allocative efficiency (€ m)	197	30755	313	-78
ToT (€ m)	1954	-7629	224	6204
Other effects (€ m)	-6962	104993	-7	-809

Table 5. Decomposition of Welfare (EV).

The ToT on the current account measures the rate of exchange between tradable exports and imports. For example, a unilateral reduction in tariffs leads to increases in

imports which, *ceteris paribus,* would result in a trade deficit. To ensure a long run balance of trade, exports must rise to compensate, so export prices must fall which implies a fall in primary factor prices and subsequently a fall in domestic market prices. As a result, the ratio of export prices to import prices would fall, resulting in a terms of trade loss. Finally, the remaining 'other' effects encapsulate price weighted changes to the exogenous shocks on factor endowments and total factor productivities as well as the impacts of population projections on per capita welfare.

The results from scenario 1 suggest that trade creation outweighs trade diversion in the case of Turkey, resulting in a welfare (real income) gain of € 752 m, equivalent to an increase of 0,243 % in per capita utility. A large part of this economic welfare gain originates from an increase in the terms of trade (€ 443 m). This is due to the elimination of tariffs on EU imports resulting in a fall in the index of Turkish import prices, coupled with increases in the index of Turkish export prices due to rises in Turkish factor prices (see Table 4). In contrast, Turkey realises efficiency losses of €72 million compared with the baseline. This is because subsidised agricultural sectors are expanding in scenario 1 compared with the baseline.[18] In the case of 'other' effects, the exogenous changes on endowments, productivity and population are identical to the baseline. However, increases in real income from 'other' effects relative to the baseline (€381 million) represent the change in the matrices of endogenous prices (i.e., weights) from the additional policy shocks in scenario 1. Thus, Turkey's competitive edge leads to increases in factor prices which imply enhanced marginal value products on projected factors of production relative to the baseline.

[18] The agriculture sector is expanding (vs. the baseline) simultaneously as domestic agricultural support expenditure is gradually falling, which implies that cumulatively, subsidy expenditure has risen in scenario 1 vs. the baseline.

Examining the results of the scenario 1 from the EU's perspective, Turkish accession has a minor impact on regional income. Given deteriorations in the EU-15 and AC-12 balance of payments, corrective falls in export prices relative to import prices lead to a ToT deterioration in the EU-15 and AC-12 of €284m and €302m, respectively. On the other hand, both EU regions witness efficiency gains as subsidised agricultural activity contracts, with concurrent increased resource usage in non-food sectors (manufacturing and services), relative to the baseline. Small factor price falls (not shown) in the EU result in reduced marginal value products on projected factors of production relative to the baseline. Summing over the welfare decomposition, we see that the EU-15 records an EV loss of €204 m whilst the AC-12 makes a gain of €22 m. These welfare changes are negligible when expressed in terms of per capita welfare (-0.001 % and 0,004 % respectively).

Examining scenario 2.1 and 2.2, migration from Turkey to the EU results in significant EV welfare losses of -€ 5018 m and -€ 4811 m respectively (Table 5) in Turkey. These losses stem from the 'other' category, given that the projections on increases in labour have decreased in scenarios 2.1 and 2.2 compared with the baseline (and scenario 1). Thus the real income falls represent the impact of migratory haemorrhaging in the Turkish workforce. In addition, with reductions in labour abundance, the domestic cost of producing Turkish goods and services rises (due to wage increases). On the other hand, with greater labour abundance in the EU-15, Turkish imports from the EU-15 are even cheaper. Combining both effects, Turkey realises improvements in the terms of trade in both scenario 2.1 and 2.2, which partially offset the losses from 'other' effects. Interestingly, the EV reduction from the exodus of Turkish labour implies a smaller population base, which results in per capita utility gains in Turkey of 1,445 % (scenario 2.1) and 1,515 % (scenario 2.2).

In the EU-15, migratory flows from Turkey, under scenarios 2.1 and 2.2, lead to long run estimated welfare gains of € 158,422 m and € 128,119 m respectively, relative to the baseline. Once again, the majority of these gains come from the 'other' category, due to increases in the stock of the labour endowment compared with the baseline. Note that skilled labour is much scarcer relative to unskilled labour in scenario 2.1 (compared with scenario 2.2). Consequently, greater production bids up the wage rate of skilled labour in 2.1 (compared with scenario 2.2), which more than offsets the unskilled wage fall in scenario 2.1 relative to scenario 2.2 (since unskilled labour is more abundant in scenario 2.1). Overall, the 'other' return on the labour factors in the EU is greater in scenario 2.1.

Examining the per capita utility gains, we see that the marginal value product of migrating Turkish labour is higher in the EU-15 resulting in a Pareto per capita utility gain in both Turkey (1,445% and 1,515%) and the EU-15 (0,462% and 0,240%) in scenarios 2.1 and 2.2 respectively. In Germany, where 76% of Turkish migratory labour is projected to locate, per capita utility increases by *2,031%* and *1,091%*[19] under scenarios 2.1 and 2.2 respectively. Finally, the differential welfare impacts in scenarios 2.1 and 2.2 in the AC-12 and the ROW are negligible since it is assumed that all migrant labour from Turkey under EU enlargement will flow to the EU-15.[20]

[19] All italicised results in the text are not provided in the tables.

[20] We accept that this assumption is simplistic given that by 2025, the benefits of EU membership will have filtered through to the AC-12 to the extent that some degree of economic convergence will have occurred implying less heterogeneity in per capita incomes across the EU-27. However, Greece and Portugal joined the EU in 1981 and 26 years on are still amongst the poorest members of the EU-15 in per capita terms. We envisage that the process of convergence is likely to take decades, such that immigration patterns of Turkish immigrants may not be affected 'considerably' in comparison with current day trends.

VI. Conclusions

There is a growing literature examining the likely economic impacts of Turkey's accession to the EU from a Turkey perspective. With improvements in computational facility and the availability of the Global Trade Analysis Project (GTAP) Database, the computable general equilibrium (CGE) methodology has become an accepted tool of analysis for assessing the impacts of market integration between the EU and Turkey. Unlike previous studies, we disaggregate all agro-food sectors from the GTAP database, since the majority of the remaining barriers to trade between Turkey and the EU lie within this broad sector. A further distinguishing feature of this study is that we employ a realistic baseline scenario incorporating policy (e.g., Uruguay Round, Chinese Accession, Doha shocks incorporating tariff binding overhangs and sensitive product concessions) and projections (endowments, productivity, population) shocks to shift the global economy to 2025. Against this baseline, we examine the impacts of Turkish membership into the EU single market on (principally) agro-food sectoral performance and real incomes (scenario 1). In a further set of experiments, we also account for Turkish migration to the EU-27, where in scenario 2.1 only unskilled labour migrates, whilst in scenario 2.2, we assume that both unskilled and skilled labour migrate.

Examining Turkish sectors, we estimate increases in agro-food production of between *5,3%* (scenario 2.1) and *6,9%*. (scenario 1) in Turkey, due to its relative competitiveness compared with the EU-27. The largest percentage growth areas are in 'meat processing', 'other meat processing' and 'vegetable oils and fats', whilst in primary agriculture, there is greater intensive (poultry) and extensive (cattle and sheep) livestock production. Notably,

Turkey's largest agro-food sector, 'vegetables, fruits and nuts' undergoes a slight decline in production due to higher tariff protection compared with the EU-27. Including the impacts of Turkish migration and the consequent reductions in the Turkish workforce (scenarios 2.1 and 2.2), we see *a priori* declines in sectoral output compared with scenario 1.

Given the limited importance of Turkish trade links to the EU-27, the trade implications from Turkish accession to the EU are slight. The accession of Turkey without free movement of labour leads to production falls in most agro-food sectors in the EU-15 and the AC-12 while the non agro-food sectors expand.[21] Predictably, with migration flows included, the EU-15 economy is predicted to grow 1% and 0,8% in scenarios 2.1 and 2.2 respectively, comparison with accession without migration (scenario 1).

In terms of real income changes, our estimates suggest that accession scenario 1 yields an equivalent variation (EV) welfare gain of €752m to Turkey, whilst with an exodus of the labour force, EV losses in Turkey range between €4,811m (scenario 2.2) to €5,018m (scenario 2.1). Importantly, with a greatly reduced population base, per capita utility rises by 1,445 % to 1,515 %. In other words, on average, people will still be better off after migration, largely due to the improvement in wage rates from a reduced labour force.

Comparing our estimate of Turkish EV gains without migration (scenario 1) with the range of corresponding estimates from the literature (between $300 m to €28,200m), our assessment appears at the lower end of the results. The main reason of this is the implementation of different scenario assumptions in each study. For example, in addition to

[21] These falls in agro-food sectors in the EU-15 and the AC-12 are -0.2% and -0.8% respectively.

the tariff eliminations in this study, the high welfare gain estimates in Lejour et al. (2004) include exogenous technical change (i.e., productivity) shocks to characterise the elimination of administrative and technical barriers to trade, institutional reform in Turkey, and the removal of non tariff barriers.

On the other hand, studies (like ours) which discount the more 'abstract' non-price components of Turkish integration are broadly comparable. Zahariadis (2005) predicts Turkish welfare gains of €480m, whilst Sulamaa and Widgrén (2007) find Turkish real income gains of between $300 m (under perfect competition) and $ 700 m (under imperfect competition), In a very recent study, Acar et al. (2007)[22] suggest a smaller welfare gain of $ 49.1m in Turkey.[23] Our results are slightly higher than these studies since we also incorporate projections to 2025, whilst the trade led gains to Turkish agro-food sectors are maximised in our study due to the abolition of all Pillar 1 agricultural support by 2025. Contextualising our estimates from scenarios 2.1 and 2.2, we find comparable estimates in Lejour et al. (2004) who also examine the effects of post accession free movement of Turkish labour. Lejour et al. (op cit.) estimate increases in per capita income of between 0,9% and 1,4% in Turkey compared with our estimates of between 1.445% to 1.515% increases in per capita income.

From an EU perspective, our estimates suggest that Turkish accession will have a minimal economic impact, a finding supported by other studies (Zahariadis, 2005; Acar et al., 2007). Indeed, that Turkey constitutes a small proportion of total EU-27 trade, much of

[22] This is a preliminary study.

[23] The authors purely focus on the impacts of agricultural reform (as do we), although unlike our study they leave agricultural support intact, which largely explains their smaller Turkish welfare gain estimate. Interestingly, the authors in that study make an additional assumption regarding EU budgetary flows to Turkey, which sees the Turkish welfare gain jump up to €10bn.

which is in agro-food produce, renders this result as unsurprising. On the other hand, including the impacts of east-west migration, we estimate EU-15 per capita utility gains of between 0,240% and 0,462%, whilst as the main recipient of Turkish migrants, German gains are expected to be even higher.

Naturally, there are caveats to this analysis and consequently our results. First of all, we are assuming that all Turkish immigrants are employed in the EU and that no 'welfare shopping' behaviour occurs. Moreover, in a comparative static characterisation, the model has nothing to say about the 'adjustment' process from equilibrium point to another, where considerable 'frictional employment' and related structural adjustments in the economy should not be underestimated.

Notwithstanding, our optimistic long run EU estimates concur with work by Littoz-Monnet and Penas (2004) and Hughes (2004), who suggest that in the context of falling indigenous EU populations and a lack of inclination by local residents to carry out specific jobs, an influx of 'cheaper' labour is seen as a key driver of EU competitiveness and economic growth. Unfortunately, many EU governments now maintain a protectionist stance toward inflows of migrants from the recent accession states. In Germany, where it is predicted that the majority of Turkish migrants are likely to locate, the government is currently committed to maintaining its labour markets in most sectors closed to new member states until 2011, despite admitting to skills shortages in a number of industries (Economist, 2007b). Unless such mercantilist sentiment is eliminated, a key component of the EU's economic gains from Turkish inclusion will disappear.

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