Tourism and EU Accession in Malta and Cyprus

Adam Blake, M. Thea Sinclair and Guntur Sugiyarto*

Abstract

Computable General Equilibrium models of Malta and Cyprus are developed and used to quantify and compare the impact of EU accession on each of these Mediterranean islands. Tourism is particularly important relative to other economic activities in these island nations, and because of this tourism demands are treated explicitly in these models, and the impact of accession on tourism demand is modelled, along with other more commonly modelled effects of accession.

Results show that EU accession is beneficial to both countries, although as a percentage of GDP Malta benefits considerably more than Cyprus – in part because EU funding is more substantial in Malta when compared with GDP, but also because Malta trades a larger share of its GDP with the EU than Cyprus does, while the effects of accession on tourism are negative in Malta and positive in Cyprus.

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1 Introduction

This report analyses the effects of EU membership on tourism in Cyprus and Malta. A computable general equilibrium (CGE) model is used for each country, which takes into account interrelationships and interdependencies across the economy. Each sector of the economy is modelled, not in isolation, but in parallel. Tourists' demands for a variety of products are included; the way in which they impact on the economy depends on which goods and services that they purchase, and on the structure of the industries providing those goods and services as well as on the rest of the economy.

CGE models are widely used in a variety of applications. General overviews of CGE models and how they have been used are provided by François and Reinert (1997), Ginsburgh and Keyzer (1997), Greenaway *et al.* (1994), Shoven and Whalley (1992) and Deverajan *et al.* (1982). De Melo (1988) provides a review of how CGE models have been used to model economic development; François *et al.* (1996) review how CGE models have been used in international trade, in particular at the Uruguay Round negotiations of the World Trade Organisation. They have gained recent use in the tourism field (Adams and Parmenter 1991, 1994, 1995; Zhou *et al.* 1997; Alavalapati and Adamowicz 2000; Janaki and Wiktor 2000; Dwyer *et al.* 2000, 2001, 2003; Blake 2000; Blake *et al.* 2001a, 2001b; Blake and Sinclair 2003, 2004; Sugiyarto *et al.* 2003). It is the 'state of the art' tool for measuring the effects of tourism in an economy. According to Dwyer *et al.*:

> "The study of the economic contribution of tourism has recently undergone a 'paradigm shift' as a result of the use of Computable General Equilibrium (CGE) models in place of input-output models … The development and application of this superior technique have major implications for the way that tourism economists think about the economic impacts of tourism and for the policy advice they give to decision makers in both the public and private sectors" Dwyer *et al.* 2003:117

CGE models have been widely used to examine the effects of customs union, and of particular relevance here, EU enlargement.

2 The Models

Two separate CGE models have been constructed for Cyprus and Malta. Each is calibrated to replicate benchmark data for 2001, which are derived from published input-output tables for earlier years, aggregate data for 2001 such as industry output and value added in that year, and in the case of the Malta model, from detailed tourist

expenditure data and cost breakdowns for various tourism-related industries. The two models are broadly similar, and are discussed here in parallel.

Each model can be considered as a set of relationships governing industries, institutions and markets in the relevant economy. Industries undertake all production activities of goods and services, using labour and capital as well as intermediate inputs to produce their output. Three institutions (households, government and the rest of the world) consume these goods and services, in addition to the intermediate products consumed by industries. Thirty-three markets exist. Twenty-nine markets correspond to sectors. In addition, there are markets for food and drink in accommodation, imported fuel and labour and capital factor services. A circular flow exists between these industries, institutions and markets (see Figure 1).

Each of the industries, institutions and markets is significantly more detailed than shown in Figure 1. Commodity markets, for example, involve importation of goods from the EU and elsewhere (the rest of the world, or ROW), the export of goods to the EU and ROW, as well as commodity taxation (VAT, excise duties and import duties). The detail of each part of the model is discussed in turn.

Table 1: Commodities in the Cyprus and Malta Models

	Cyprus Model Commodities		Malta Model Commodities
1	Agriculture and hunting	1	Agriculture and Fisheries
2	Forestry and logging	2	Mining and Quarrying
3	Fishing	3	Food
4	Metal ore mining	4	Beverages
5	Other mining	5	Tobacco
6	Food, beverages and tobacco	6	Textiles
7	Textiles and textile products	7	Footwear
8	Wood and wood products	8	Wearing Apparel
9	Paper and paper products	9	Furniture & Fittings
10	Chemicals and chemical products	10	Printing
11	Non-metallic mineral products	11	Leather
12	Metal products, machinery and equipment	12	Chemicals
13	Other manufacturing industries	13	Non-metallic Minerals
14	Electricity	14	Metals
15	Gas	15	Machinery
16	Water	16	Rubber, Transport and Shipyards
17	Construction	17	Miscellaneous
18	Wholesale and retail trade	18	Construction
19	Restaurants and hotels	19	Gas
20	Transport and storage	20	Electricity
21	Communication	21	Water
22	Financial institutions	22	Other Prod. & Trade
23	Insurance	23	Other Industries
24	Owner occupied dwellings	24	Accommodation
25	Other real estate	25	Restaurants
26	Business services	26	Car Hire
27	Sanitary and similar services	27	Air Malta
28	Social & related community services	28	Airport
29	Recreational and cultural services	29	Food and drink sold in accommodation establishments*
30	Personal and household services	30	Imported fuel*
31	Public administration and defence	*	Commodities 29 and 30 are the only commodities to not have a corresponding production sector.
32	Public services		
33	Other non-profit producers		

2.1 Industries

Any CGE model must describe how industries respond to changes in output and input prices. The Malta and Cyprus CGE models involve functional forms to describe the relationships that take place at the level of industries that, despite being disaggregated to twenty-nine and thirty-three sectors, represent the aggregate activity of hundreds or thousands of individual firms.

The structure of each industry is demonstrated in diagrammatic form in Figure 2. In order to produce output, each industry i must use inputs of factor services and intermediate goods. Factor services are divided into labour and capital services, and intermediate demands for each commodity are divided into demand for domestically produced goods and demand for imports. Each of these demands is taxed according to

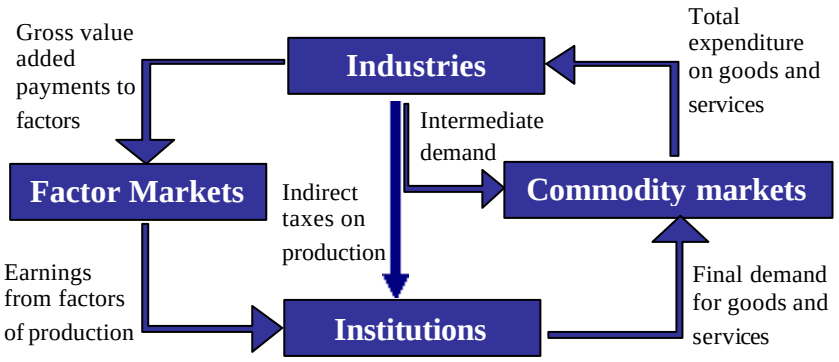
commodity taxation rates. Industry output is subject to a production tax or subsidy, and may constitute the output of more than one commodity although, in practice, each industry produces only one commodity, except accommodation which produces two commodities.

The manner in which industries respond to prices is governed by functions that specify the elasticity of substitution between inputs, and output functions that specify the elasticity of transformation between outputs. An elasticity of substitution specifies how easily technological processes can be changed in order to use more of one input and less of another in response to a change in prices or wages. For example, the elasticity of substitution between labour and capital specifies how industries' demands for labour and capital will change following a change in the wage rate of either factor. A high elasticity means that an increase in the wage rate of labour will have a greater effect on the demand for capital; firms will use more capital and less labour. A lower elasticity dampens the ability of industries to respond in this way to price changes. At the extreme, an elasticity of zero means that industries will not respond to changes in prices. In this case, an increase in the wage rate of labour would not change an industry's demand for capital.

The use of elasticities of substitution in this way is a standard computable general equilibrium modelling procedure. Elasticity values can often be obtained from other sources, and the elasticities are sufficiently intuitive to provide a good estimation of how they change when moving from the short-run to the long-run, where substitution possibilities are usually much more common. Firms can introduce new forms of machinery or working practices in order to implement labour saving measures if labour becomes prohibitively expensive, but this is more common when labour is undergoing a long-run change in wage rates rather than in response to short-term wage movements.

The elasticity of substitution between factors is governed by a parameter, $ESUBF_i$, that is taken from the Global Trade Analysis Project (GTAP) database (Hertel 1997). These elasticity values are commonly used in CGE models, and are based on econometric studies. The elasticity of substitution between goods and value added, $ESUB_i$, is set to zero in the short-run version of the model. This is a common value of this parameter in CGE models, and reflects the fact that it is difficult in short periods of time to implement technological change that uses different intermediate inputs. Values for the elasticity of substitution between imported and domestic goods, $ESUBM_j$ are also taken from the GTAP database. Note that the same elasticity

Figure 1: The Circular Flow of Income

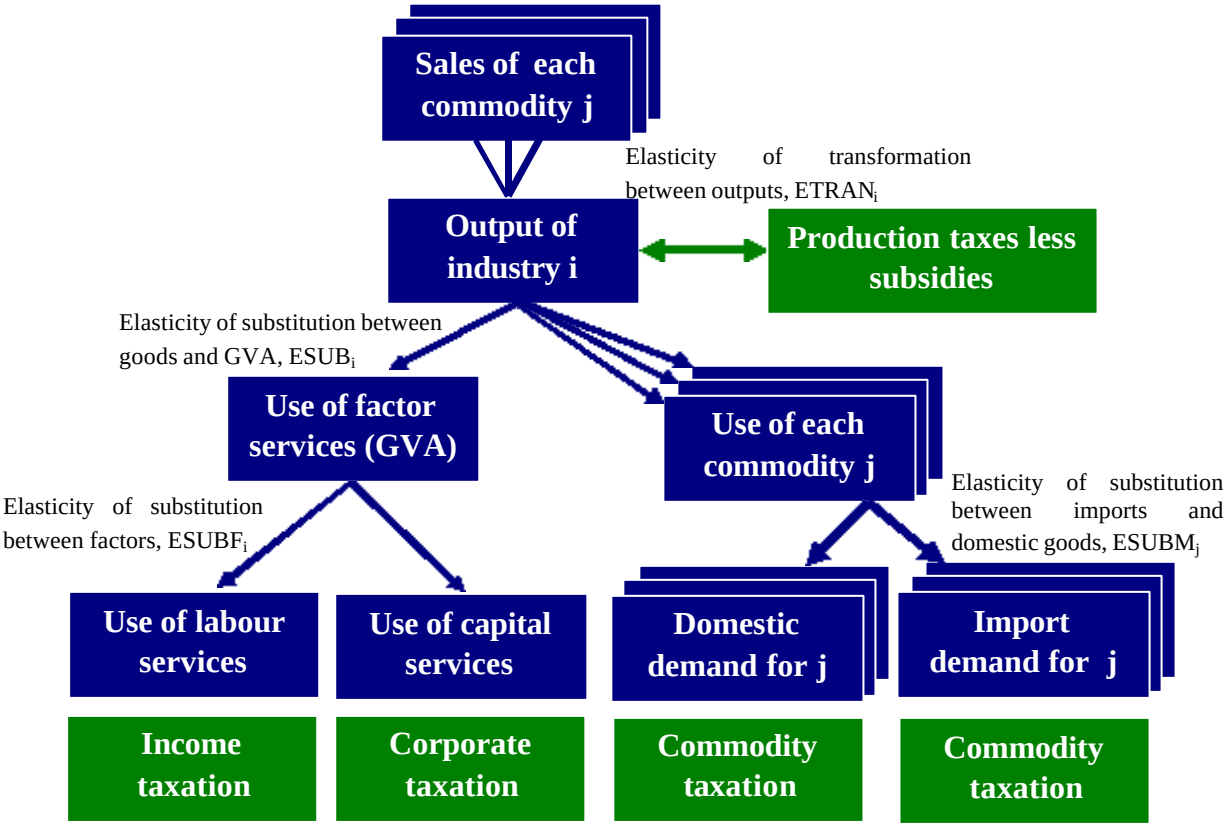


$ESUBM_j$ is used for each input good in different industries, but that the elasticities for different goods have different values.

The elasticity of transformation between outputs is governed by a parameter, $ETRAN_i$, that is set to a value of one. As all other industries produce just one product, this parameter only has an effect in the accommodation sector, where it governs how the accommodation sector responds to changes in prices in accommodation and food and drink in accommodation establishments. A value of one allows the accommodation industry to change the provision of these services in response to price changes.

Various measures can be calculated from the industries to demonstrate how the economy is affected by the changes being introduced through simulations. The percentage change in industry output indicates which industries are expanding or contracting. The change in employment of labour and/or capital can be used to determine how the structure of employment changes. Gross value added, the sum of labour and capital employment, can be used to determine a value that shows how the structure of employment changes in a way that is comparable across sectors to show which industries have the more significant effects on earnings. Gross domestic product generated by each sector can also be used to show how each industry's contribution to GDP changes. GDP generated by industry is similar to GVA, but includes indirect tax income generated by the industry, and is a deflated indicator rather than a constant-price one.

Figure 2: Industry Output



2.2 The Household Institution

The household is an important component of the CGE models, as any objective measure of whether a change is or is not beneficial will depend in a large part on how it affects the household. The household receives the majority of after-tax factor income, and is the largest single part of final demand expenditure. It receives, in addition to net factor incomes, a net income from the rest of the world that comprises net transfers from abroad as well as net labour earnings from abroad. The household also receives transfers of income from the enterprise and government institutions. It spends the income it receives on consumption goods and investment goods (domestic savings).

The functional forms used in specifying the behaviour of the household are similar to those used in the industry specifications. The household does not produce goods or services, but rather it purchases goods and services in order to maximise its utility. Utility is then specified as a function of input commodities in a similar way to the formulation of industry production functions. Utility is created by the purchases of private consumption and investment, each of which is a product of purchases of (potentially all) commodities. Aggregate investment is a function of investment purchases of each commodity and an elasticity of substitution ELASI governs how investors may respond to rises in the prices of capital goods. The demand for each commodity is split into demand for domestic and imported goods, in a similar manner to the intermediate purchases of industries described above.

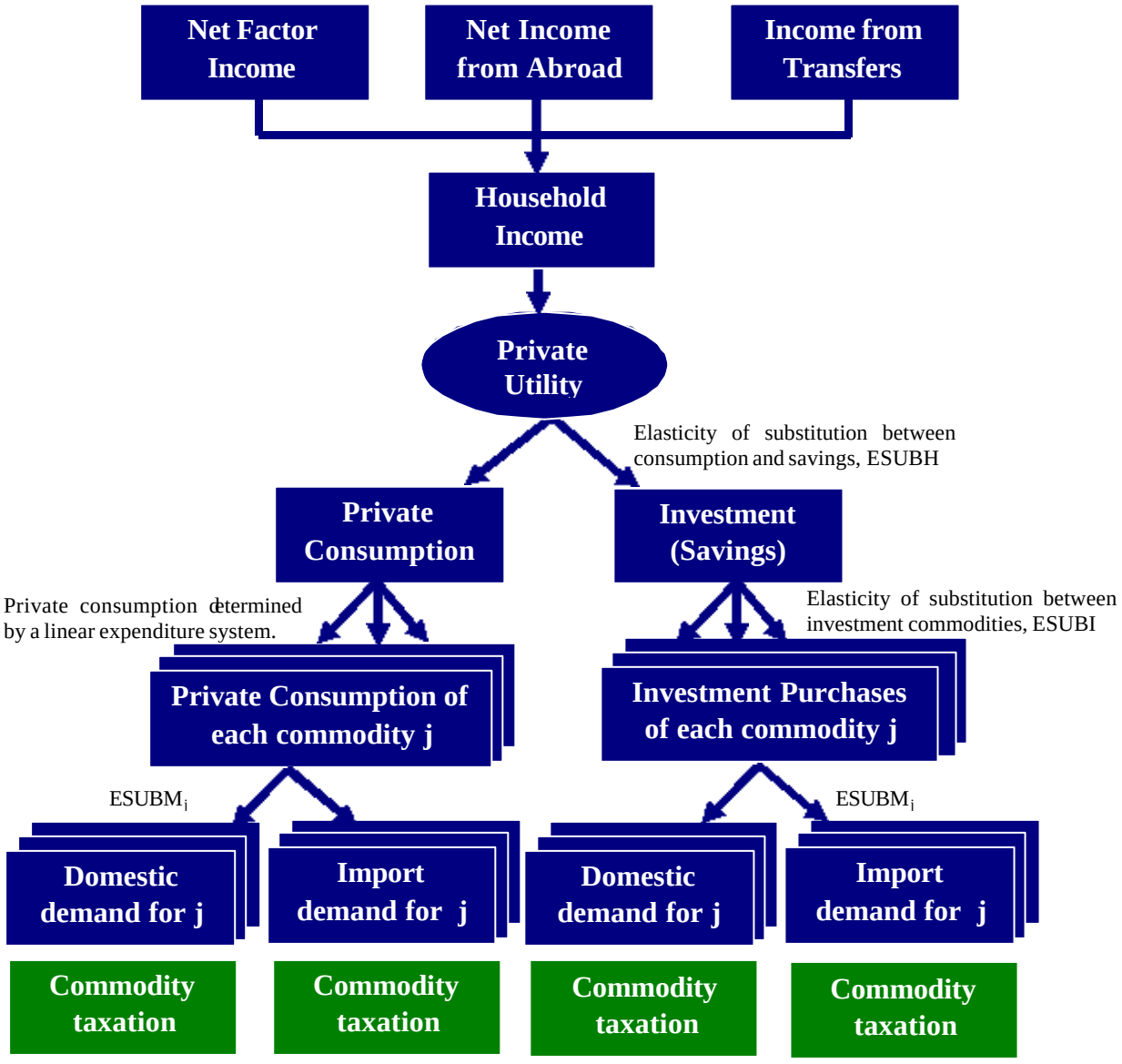
Aggregate consumption is a function of consumption purchases of each commodity. This function is governed by a linear expenditure system (LES) that is a more general form of function that is often used for private consumption expenditures. The use of the LES function means that income elasticities of demand are input into the model, and private consumption responds appropriately when household income rises. Consumption of each commodity is split into demands for imported and domestically produced goods in the same manner as intermediate and investment purchases above. Commodity taxation is also applied in the same manner as above, although it should be noted that commodity taxes paid by the household tend to be much larger than paid by other users, as the majority of VAT payments are attributed to them.

The elasticity values used in the household institution are either sourced from the same database as the industry elasticities (income elasticities, Hertel 1997) or set to commonly used values (ELASI=0, ESUBH=1).

The use of a utility function with demand conditions that are consistent with that utility function leads to a model that is microconsistent. This means that the household utility that is calculated within the model is fully consistent with the demand functions that are used. Forms of simulation modelling other than CGE modelling tend to employ demand functions that are not consistent with any utility function, and therefore any evaluation of how beneficial a given change is must use *ad hoc* utility formulations in such models.

The advantage of a microconsistent utility function is that it is possible to evaluate whether a simulation leads to the household being better or worse off than without the simulated changes. The way that government consumption is treated (see below) enables changes in household utility to be interpreted as changes in economic welfare. Economists tend to measure a change in welfare by a measure termed equivalent variation (EV), which indicates how much the change in welfare is worth to the economy at the pre-simulation set of prices. This measure takes the results from what may be quite complex effects of a simulation on a household and produces a single value to describe how much better (or worse) off the economy is as a result of such effects. Equivalent variation will therefore be used, along with production measures such as gross value added and gross domestic product to assess the effects of simulations on the economy.

Figure 3: The Household Institution



2.3 The Enterprise Institution

The enterprise is the simplest institution in the CGE models. It receives income from capital, purchases investment goods to replace depreciated capital, receives net investment from abroad, and transfers any remaining income to the household. Investment demand is fixed in terms of the quantity of aggregate investment goods that the enterprise demands. With ELASI set to zero, the demand for each individual commodity is effectively fixed, as prices do not lead to substitution between capital goods. In the long-run assumptions described below, ELASI is not zero, so while the aggregate demand for investment goods by the enterprise is fixed to replace only depreciated assets, substitution between different types of commodity is possible.

2.4 The Government Institution

The government receives income from all forms of tax payments and income from abroad. It spends its income on public consumption goods and transfers any income left over to the household. Income from taxes is received from both direct and indirect taxation. Direct taxes are income tax on labour earnings and corporation tax on eligible capital earnings. Indirect taxes are (net) taxes less subsidies on production, import tariffs and taxes on consumption (VAT and excise duties). It should be noted that the fixed demand for public consumption goods is a necessary measure in order to make welfare calculations. If government consumption were to vary, it would not be possible to calculate welfare measures such as equivalent variation because the value of the additional public consumption would need to be incorporated, and this could only be done in an *ad hoc* manner.

The Rest of the World Institution

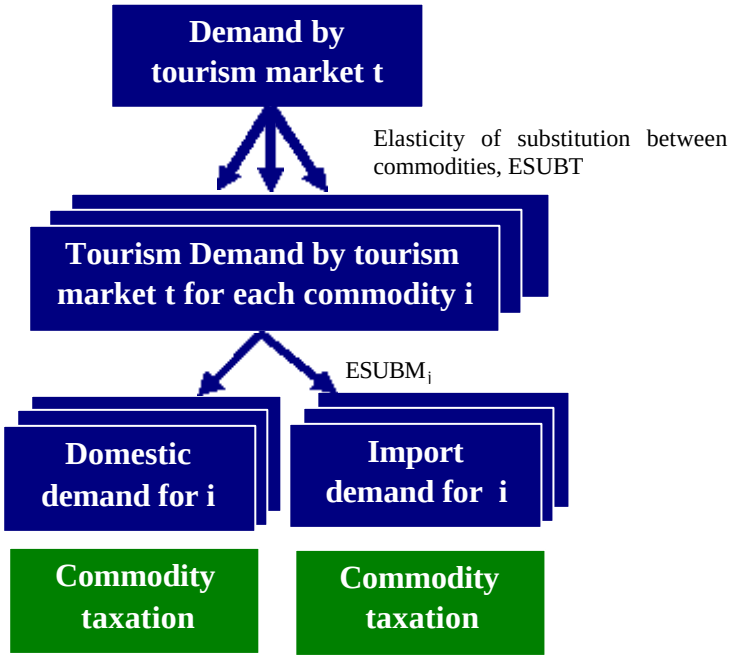
The rest of the world (ROW) fulfils several different functions in the CGE models. It purchases exports from the domestic economy and supplies imports. It has direct interactions with the other institutions, with net transfers being paid to the household, net capital income being paid to the enterprise, and net government receipts from abroad being paid to the government. Finally, the rest of the world purchases goods and services in the domestic economy to satisfy tourism demand. In the Malta model, tourism demand is modelled separately for each of eight different tourist markets.

Imports and exports of commodities are unconnected in the sense that the quantity or value of exports that the ROW purchases from the domestic economy of a particular commodity is not connected to the quantity or value of imports of that commodity that the ROW supplies. Malta and Cyprus are both deemed to be small economies in relation to the size of global markets, so that any change in exports or imports will not affect foreign prices.

Tourism demand by each tourism market is split into demands for individual commodities, as shown in Figure 4. In the Malta model, there are eight tourism markets modelled – representing the seven main nationalities of tourists plus one 'other' market. In the Cyprus model there is only one tourism market – tourism demand has not been disaggregated. An elasticity of substitution between goods and services purchased by tourists (ELAST) is set to equal one, so that tourists are able to purchase more of one commodity and less of others in response to price changes. Typically this might involve shorter stays if accommodation prices rise substantially, so that accommodation demand is reduced, with little or no reduction in expenditures on air travel and entertainments. Tourists might respond to higher airfares by increasing the length of their stay, so that the share of air transport in total tourism expenditures falls and the share of other purchases increases. Tourists are therefore able to substitute between commodities.

Figure 5 shows the way in which aggregate tourism demand responds to prices. Given the type of function indicated in Figure 4, an aggregate price paid by each tourism market for the products that tourists from that market purchase is derived. Aggregate tourism demand in each market is then given as a function of that price (Figure 5). If, for example, hotel prices fall, this will not only lead to tourists purchasing more hotel services as a share of their total expenditure, but will also lead to a fall in the aggregate price that tourists face. This decrease in price will lead to an increase in demand for tourism, as determined by the demand curve in Figure 5. Increased

Figure 4: The Structure of Tourism Demand



aggregate demand will lead to increases in the demand for each individual commodity through the structure given in Figure 4. These effects will work through each tourism market in different degrees because the demand shares are different for different markets. A tourism market where a higher proportion of expenditures is spent on accommodation services would, for instance, be effected more by these changes than tourism markets where the accommodation demand share is lower.

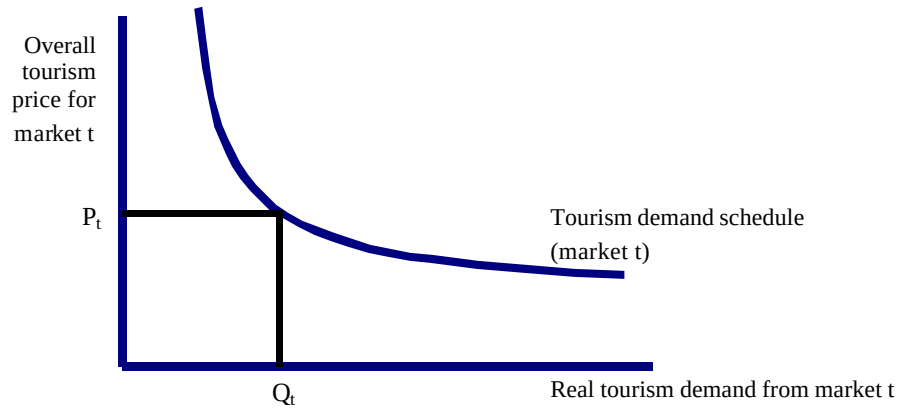
2.5 Commodity Markets

Markets for thirty-one commodities are included in the Malta model, and for thirty-three commodities in the Cyprus model. Figure 6 shows the distribution of domestic production and Figure 7 shows the supply of imported products. Both domestic and imported products are demanded by industries and institutions as part of their demand structures, as described above.

Domestic production can be sold to either domestic or export markets, and the manner in which this is modelled is that a change in export or domestic prices will induce producers to change the proportion of their output that they sell to the respective markets. An elasticity of transformation, $ETRAN_i$, describes how easily producers can make this switch. The use of a transformation function means that the types of goods sold on domestic markets are qualitatively different from those sold to those sold on export markets. Some firms, for example, may grade their products and export a different grade than they sell locally. An increase in export price cannot be seamlessly incorporated into the firms' plans because differently-graded local products cannot be exported. In this case the firm might have to change its production processes, grading schemes or marketing in order to be able to increase its export production.

Other reasons why domestic and export markets differ may result from different consumer tastes and preferences, different models of product (left-hand drive and right-hand drive cars produced in the UK, for example), different packaging (due, for example, to language differences) or legal requirements. A final reason for these differences is that CGE models operate using aggregate definitions of goods. While apples produced for the export and domestic markets might not differ and pears

Figure 5: Overall Tourism Demand by Market



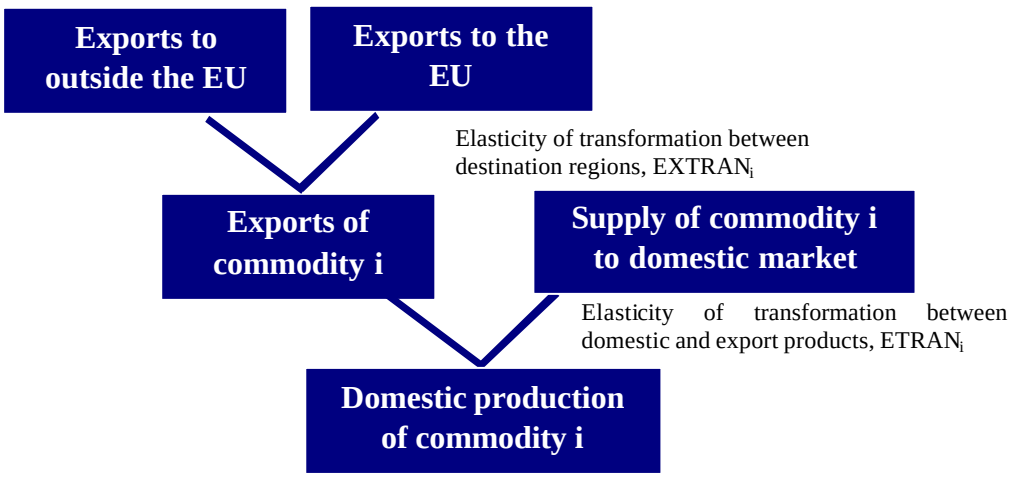
produced for the export and domestic markets might also not differ, if they are exported in different proportions to their domestic use, the aggregate 'fruit' product that is exported is not the same as that which is produced for the local market. For these reasons, it is common practice in CGE models to assume that there is a transformation function between export and domestic markets. Similarly, exported goods bound for the EU are likely to be different from the goods exported to other countries, so a transformation function is used for exports to these destination markets

The import markets shown in Figure 7 rely on similar reasoning, in that imports are different products from domestically produced products (this is already incorporated into the way that domestic and import demand are differentiated in industry and institution demand above), and imports from the EU are different products from imports from outside the EU. As empirical estimates of these trade elasticities of substitution are not available, it is common practice to set them equal to double the value of the elasticities used between domestic and import products, $ESUBM_i$. Imports from both regions are taxed according to an import tariff.

It should be noted at this stage that an important distinction between the Malta and Cyprus models exists with respect to the way that imports are modelled. In the Malta model, imports of each of 31 commodities are included, and data on the use of each of these commodities in each of 29 production sectors and different categories of final demand are included so that it is possible to show the effect that any one import price has on different types of consumers. In the Cyprus model, data limitations mean that at present imports are modelled in aggregate only. Each production sector and category of final demand imports a common import commodity, but it is not possible to determine which product is used by which user. The relationships represented in Figure 7 occur only at the aggregate level in the Cyprus model.

Apart from the structures discussed above, commodity markets have one other important attribute: each product has a domestic price and a price of imports that will change in the course of a simulation in order to preserve market equilibrium for domestic and imported goods markets. An increase in demand will have an initial effect of increasing the price of the affected good(s), which will have follow-on effects as this impacts upon each industry and institution that purchases the good(s).

Figure 6: Domestic Markets in the Malta and Cyprus CGE Models



An increase in tourism demands will, therefore, increase the demand for each of the domestically produced and imported commodities that tourists consume, which will increase the price of those products and increase the price received by industries that produce those products. Industries will then increase output, for which they must increase their input demands, both for intermediate inputs (which leads to further follow-on effects) and for factors of production. At all stages of production and consumption, tax revenues received by the government may change.

2.6 Factor Markets

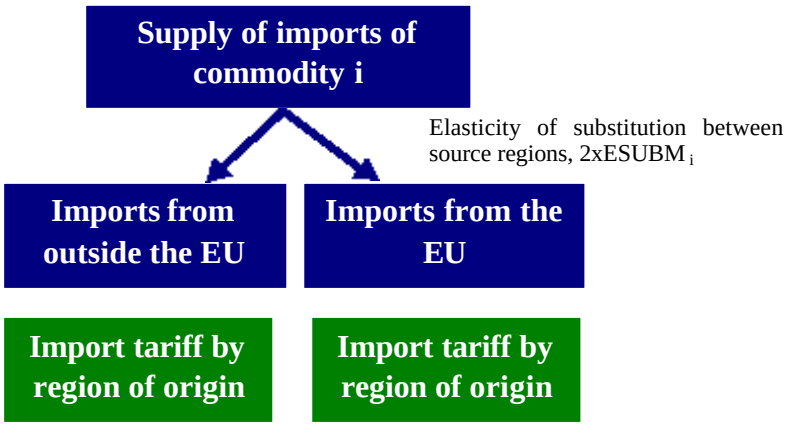
The factor markets for labour and capital determine many of the underlying characteristics of the model. An increase in the demand for factors of production will increase the wage that they earn, and therefore increase the wages that firms in all industries must pay for factor services. This has effects across the economy, and depends on the way in which factor markets are modelled. A number of different aspects of factor markets are modelled:

- The ease with which labour and capital can move to different sectors of employment is specified, with different values according to whether short-run or long-run assumptions are being used. Factor mobility can vary from completely rigid (capital is sector-specific in the short-run) to completely mobile.

- Unemployment is incorporated into the model, with a Phillips-curve relationship between real wages and unemployment. This specifies that as real wages increase, unemployment will fall (and *vice versa*). The values for the parameter governing this function are different in short-run and long-run assumptions.

- Factor supplies are fixed in the short-run, but vary in the long-run in a relationship with real wages. Under the long-run assumptions, increases in real wages lead to increases in factor supply. This is because (i) households supply more labour and take less leisure time when wages are high, and (ii) because higher real wages

Figure 7: Import Markets in the Malta and Cyprus CGE Models



increase the returns from training and education (for labour) and investment (for capital), increasing the efficiency value of factor supplies.

2.7 Short-Run and Long-Run Model Variants

The model described above is solved for two variants relating to the time-span over which the economy can adjust to simulated changes. The short-run assumptions are applicable to the economic adjustment that will take place over 1-2 years. The long-run assumptions are applicable to adjustment over 3-5 years or longer. This is the approximate time scale under which all economic adjustments will have been made following an external change.

The long-run model generally involves higher elasticities than the short-run model, because production technologies can be replaced over a long period of time. The elasticity values used in short-run and long-run variants are given in Table 2.

Table 2: Elasticity Values in the Malta and Cyprus CGE Models

Elasticity value	Short-run	Long-run
elasticity of substitution between labour and capital in production	*	Doubled
elasticity of substitution between goods and factors in production	0	0.5
elasticity of substitution between imports and domestic goods	*	Doubled
elasticity of substitution between imports from EU/ROW	2*ESUBM	Doubled
elasticity of transformation between exports and domestic goods	1	2
elasticity of transformation between export regions	ESUBM/2	Doubled
elasticity of substitution between goods (household)	1	1
income elasticity of demand for goods by the household	*	Unchanged
elasticity of substitution between goods (investment)	0	0.5
elasticity of substitution between goods (tourists)	1.5	1.5
price elasticity of demand for tourism	**	Unchanged
elasticity of labour mobility	5	10
elasticity of capital mobility	0	∞
elasticity of unemployment to real wages	1	0
elasticity of labour supply	0	0.5
elasticity of capital supply	0	1

Notes:

* these values are taken from the GTAP database version 5 (Hertel 1997), and differ for each commodity.

** these values are taken from Durbarry and Sinclair (2002) for Malta and Durbarry *et al*. (2002) for Cyprus.

2.8 Sensitivity Analysis

Key results will be analysed as regards how sensitive they are to elasticity parameters. The 'Monte Carlo' procedure for conducting systematic sensitivity analysis is to construct a range around the central estimate of the parameter used in the main model and conduct n simulations, in each of which every elasticity is varied by either plus or minus the range, on an entirely random basis. The results from the n simulations can then be compared, and the standard error of each simulation result can be calculated. In trials conducted on the simulation of increased demand in all tourist markets, it was determined that n=100 is a sufficiently large sequence of simulations to provide

accurate measures for standard errors. This test conducted seven different sensitivity 'runs' with values of n between 10 and 10,000. Derived standard errors for n=100 were identical at the reported level of accuracy to those for n=10,000.

Table 3 shows the value or range in the short-run variant of the model and the coefficient of variation for a 95% confidence interval attached to each elasticity. The trade elasticities relating to imports, for example, are given a coefficient of variation of 100%, so that for an elasticity value of 5, a standard error of 5 is used, and the 'Monte Carlo' simulations include, randomly, values of 0 and 10. Elasticities over which there is more certainty are given lower coefficients of variation. Standard errors for price elasticities of tourism demand are taken from Durbarry and Sinclair (2002) and Malta and Durbarry *et al.* (2002).

Table 3: Sensitivity Analysis to Elasticity Values

Elasticity value	Short-run value or range	Coefficient of variation (95%)
elasticity of substitution between labour and capital in production	0.2 to 1.68	50%
elasticity of substitution between goods and factors in production	0	50%
elasticity of substitution between imports and domestic goods	3.6 to 10.4	50%
elasticity of substitution between imports from EU/ROW	7.2 to 20.8	50%
elasticity of transformation between exports and domestic goods	1	25%
elasticity of transformation between export regions	1.8 to 5.2	25%
elasticity of substitution between goods (household)	1	50%
income elasticity of demand for goods by the household	0.131 to 1.261	-
elasticity of substitution between goods (investment)	0	50%
elasticity of substitution between goods (tourists)	1.5	50%
price elasticity of demand for tourism	1.66 to 4.21	*
elasticity of labour mobility	5	10%
elasticity of capital mobility	0	10%
elasticity of unemployment to real wages	1	-
elasticity of labour supply	0	25%
elasticity of capital supply	0	25%

Note:
* standard errors from Durbarry and Sinclair (2002) and Malta and Durbarry *et al.* (2002) as well as unpublished results from those studies are used instead of a coefficient of variation for tourism demand elasticities.

3 The Effects of EU Membership

The accession of Malta and Cyprus to the EU will have a variety of effects on the Maltese and Cypriot economy and on tourism in the two economies.

The range of effects that are modelled here are:

- The effects of removing tariffs on imports from other EU states.
- The effects of other EU states removing their tariffs on accession country exports.
- The effects of the imposition of the EU's common external tariff on imports from countries outside the EU.

- The effects of reduced trade costs from operating within a single market.

- The effects of improved standards.

- The net budgetary benefits that Malta and Cyprus will receive from the EU structural funds and temporary budgetary compensation, including the effects of investment expenditure under these programmes, including partially matching funding from the domestic government. In addition, the possible effects that these investment expenditures will have through raising productivity in related sectors are modelled.

- The effects that reduced trade costs, improved standards and stability will have on tourism demand.

- The possible effects that membership of the EU will bring in terms of additional tourism demand are modelled.

- The combined effects of all the above effects are also modelled.

Each of the effects outlined above, including the combination of all effects of EU membership, are shown in terms of the short-run and long-run model variants outlined in section 2.7.

Column 1 in Table 7 and Table 8 shows the total effects of EU membership. The details of the simulations that are included in these results are given below in individual sections.

EU accession is found to be unambiguously and significantly beneficial to both the economies of Malta and Cyprus.

In Malta, GDP will increase by almost 4 percent in the long-run because of accession. The welfare benefits of accession are Lm 160 million, a highly significant 14% of incomes. EU accession increases employment by 3,559 full time equivalent jobs in the long-run, although there are significant levels of job reallocation as 6,475 jobs are lost from their original industries – indicating that in total 10,034 jobs are created but around two-thirds of these are replacements for 'old jobs' that are lost as a result of accession.

In Cyprus, GDP will increase by almost 3.5 percent in the long-run because of accession, with welfare benefits of 315 million Cyprus Pounds (5.5% of incomes). Results for job changes and jobs lost as a result of accession show that there is a significant job creation effect from EU accession (+3,581 jobs) with a large degree of job reallocation (a total of 2,468 jobs are reallocated).

Tourism expenditures in Malta are projected to fall by 1.72% in the long-run as a result of EU accession, while tourism expenditures in Cyprus are projected to increase by 6.77%. Effects on tourism-related sectors follow a similar pattern to these overall changes in tourism demand. There are several reasons why these patterns of tourism demand effects differ, which essentially require close examination of the results from a breakdown of the nine components of EU accession modelled.

3.1 Imposing the EU common external tariff

Column 2 in Table 7 and Table 8 shows the effects of Malta and Cyprus imposing the EU common external tariff (CET) schedule on imports from countries outside the EU. In both models, the CET most-favoured-nation rates (the rate that is charged on imports from countries that are not given special provisions, such as least-developed countries) are derived from a standard modelling database (GTAP 2001), which in turn is derived from individual country submissions of tariff schedules to the UN. Trade-weighted averages for the commodity groups that are identified in the model are computed from that database. The application of the CET represents a reduction in tariff rates on average, although in some cases (agriculture, food, textiles and clothing) the CET is higher than the tariffs previously imposed by Malta. In these cases the application of the CET is an increase in trade restrictiveness.

Table 7 shows that the application of the CET will be beneficial to the Maltese economy in the long-run, with an increase in welfare of Lm 5.1 million, and an increase in GDP of a quarter of one percent. In the short-run, these results are reversed, with decreases in welfare and GDP. The reason for these results are because the long-run case enables the Maltese economy to react to the reduction in average tariff rates and take advantage of the liberalisation it represents while in the short-run, fewer resources can be moved away from import-competing industries that decline because of the tariff reduction into exporting industries that are stimulated by a declining real exchange rate following the average tariff reduction. The scale of resource movement necessary to enable the economy to take advantage of the benefits of liberalisation are evident from the figures on employment, where 36 FTE jobs are created in net terms in the long-run case, but a total of 1,081 FTE jobs are lost, indicating that in total 1,117 jobs are created in total. The scale of job reallocation is much larger than either the net creation of jobs or the scale of job reallocation in the short-run.

In the Cyprus model, the application of the CET represents a small liberalisation of tariff rates from an average of 6.5% to 6.3%. Column 2 in Table 8 shows that, in the long-run, the application of the CET increases GDP by 1% and increases welfare by almost 1% of original incomes. While a similar number of jobs (924) are lost from their original industry to the Maltese case, in Cyprus the application of the CET leads to net job creation of 857 jobs.

3.2 The effects of removing import tariffs on imports from the EU

Column 3 in Table 7 and Table 8 shows the effects of removing import tariffs on imports from the EU. The results indicate that in the short-run there may be small welfare losses and significant job reallocation but that in the long-run the reduction of tariffs on EU imports is strongly positive for welfare, although there is still a significant level of job reallocation.

Malta applies tariffs on imports that are relatively low by international standards, with an average rate of 2.2% (EU 2003). Malta imports a considerable portion of its total imports from the EU. Malta's tariffs in the social accounting matrix (Blake *et al.* 2003) are eliminated in this scenario on imports from the EU (but are maintained at their original level on imports from outside the EU).

The effects of removing tariffs on products from the EU are beneficial to the Maltese economy in the long-run, but detrimental in the short-run, although it should be noted that the coefficients of variation for the change in GDP are greater than one, indicating that although the predicted effects on GDP are sensitive to model parameters. The reasons for the positive welfare (equivalent variation) effect in the long-run and negative effect in the short-run are the same as in column 2, but are more pronounced because removal of Maltese tariffs on imports from the EU represents at total elimination of tariffs on imports from this market rather than partial reduction as is the case in the former, and because imports from the EU are larger in value than from outside the EU.

In Cyprus, the results of removing tariffs on EU products are beneficial in the long-run, increasing GDP by 0.49% and leading to EV welfare gains of 0.26% of original income levels. Government revenues decline significantly from the loss of tariff revenues. The job creation and reallocation effects for this component are similar to those for the CET component, but at a larger scale, with a net increase of 2,117 jobs and a total of 2,525 jobs lost.

3.3 Entry into EU markets

Column 4 in Table 7 and Table 8 shows the effects of other EU states removing their tariffs on Maltese exports. The same CET schedule is used as described above. The price that Maltese exports receive in EU countries is increased by the level of the CET, as Maltese goods receive the same price in EU markets as they received prior to EU entry inclusive of the EU tariff.

Entry into EU markets is found in both countries to have unambiguously positive effects on GDP and welfare that are highly robust, and in short-run outweigh the negative effects from the previous two simulations by a significant degree. The ability to sell goods into the EU market at higher prices than previously is a hugely significant source of welfare gain for both Malta and Cyprus. It should be noted that the scale of job reallocation with market entry is also very high; with (in the long-run in Malta) 737 jobs created in net, 1,493 jobs lost and 2,430 jobs created in total. For every net job created two workers have to move from their original industry of employment to another industry.

In Cyprus, entry into EU markets is also beneficial in both the short-run and long-run, with significant job reallocation effects. The overall size of the benefits to Cyprus (0.15% EV gain in the long-run) are smaller than in Malta (2.36% EV gain in the long-run). This is, as Table 4 shows, largely because Cyprus exports are smaller relative to the total size of the economy than is the case in Malta. Despite the fact that a larger share of Cyprus exports go to the EU market, the direct effects of elimination of EU tariffs on Cyprus' exports are around half the direct effects in Malta.

The smaller overall effect of market entry for Cyprus leads to a significantly smaller effect on tourism. In both countries, the ability of commodity exporters to gain higher prices in the EU crowds out tourism exports, in both the short-run and the long-run. This effect is much smaller in Cyprus (-0.03% in the long-run) than in Malta (-2.12% in the long-run) precisely because Malta is benefited to a larger extent by market entry

than Cyprus is. This effect is important in determining the overall effects of EU accession on the two countries.

Table 4: Export Shares and EU Tariff Rates

	Commodity Exports as % of GDP, 2001	Commodity Exports to the EU as % of all commodity exports, 2000	Average EU tariff on Exports of Malta/Cyprus	EU tariff x commodity exports to the EU / GDP
Malta	65.0	39.4	2.3	0.59
Cyprus	25.2	57.4	1.9	0.27

3.4 Reduced trade costs

Column 5 in Table 7 and Table 8 shows the effects of reduced trade costs from operating within a single market. As Harrison *et al.* (1997) note, studies that have examined the role of the European single market have tended to find that the single market has reduced trade costs by around 0.5 to 2.0 percent. The effects of Malta and Cyprus's accession are identified here as a reduction in trade costs of 0.5 percent, which is applied as the ability to purchase goods from the EU with a 0.5 percent saving, and to export to the EU with a 0.5 percent increase in price received.

Reduced trade costs are found to be beneficial in terms of GDP and welfare in both the short-run and long-run in both countries. In Malta the scale of benefits is not as high as in the 'Market Entry' case, but in Cyprus the scale of benefits (0.57% of original income) is larger than the previous case, but not as high as in Malta (1.48% of incomes). The reduction of trade costs are still an important source of gain for the both the Maltese and Cypriot economies; the long-run benefits from this component account for just over one tenth of the total gain from EU membership in both countries.

Reduced trade costs lead to declines in tourism expenditures for similar reasons to the reductions in the market entry case – commodity exporters are able to receive higher prices in the EU market and therefore pay higher wages; there is an appreciation of the real exchange rate that makes tourism more expensive than previously, and reduces tourism demand. These effects are seen more heavily in Malta, with a decline in tourism expenditures of almost 1% than in Cyprus where there is a decline of 0.15%

3.5 Improved standards

Column in Table 7 and Table 8 shows the effects of improved standards. Improved standards increase the marketability of Maltese and Cypriot exports within the EU and increase the price that exporters receive by 1 percent on all commodity exports to the EU.

Improved standards are found to be beneficial in terms of GDP and welfare in both the short-run and long-run in both countries. In Malta the scale of benefits is not as high as in either the 'Market Entry' case or the 'Trade costs' case, with slightly larger

job reallocation effects than in the latter case, while in Cyprus the benefits are higher than these two other cases. The reason for these differences relates to how components effect imports and exports; in general, because Malta exports a higher percentage of its' GDP to the EU it gains more in components that increase exports.

Tourism expenditures also fall in the improved standards case, in both countries, and in both the short-run and long-run for the same reasons outlined above. The effects on tourism from market entry, trade costs and improved standards are, combined, a major reason why tourism expenditures may decline as a result of EU accession. In all three cases, the effects on Malta are larger than on Cyprus, which explains in some part why EU accession reduces tourism expenditures in Malta but not in Cyprus.

3.6 EU structural funds and temporary budgetary financing

Table 5 shows the budget allocations for Cyprus and Malta between 2004 and 2006. Cyprus will receive an initial structural funds allocation of 27.7 million Euros per annum, which will fall sharply to just 5.05 million Euros in later years. Malta will receive less in structural funds in 2004, but its' allocation will grow to 27.15 million Euros. The figures for structural funds are small in comparison to temporary budgetary compensation, from which Cyprus will receive 68.0 million Euros in 2004, growing to 112.3 million Euros in 2006. Malta will receive 37.8 million Euros in 2004, growing to 62.9 million Euros in 2006. Although the budgetary compensation payments are larger than structural funds allocations, they are by their very nature temporary, and although funding post-2006 is not yet allocated, it is likely that at some point in the future both countries will cease to receive temporary budgetary compensation, although they will probably continue to receive structural funding of a level comparable to their 2006 allocation for many years to come.

Table 5: EU Funding Allocations for Cyprus and Malta, 2004-2006

	Structural Funds Allocation			Temporary budgetary compensation		
	2004	**2005**	**2006**	**2004**	**2005**	**2006**
	Euros, million			Euros, million		
Cyprus	27.7	5.05	5.05	68.0	119.2	112.3
Malta	12.2	27.15	27.15	37.8	65.5	62.9
	Percentage of 2001 GDP			Percentage of 2001 GDP		
Cyprus	0.27	0.05	0.05	0.66	1.15	1.08
Malta	0.32	0.70	0.70	0.98	1.69	1.62

Column 7 in Table 7 and Table 8 shows the net effects of EU structural and cohesion funds. This includes the net budgetary benefits that Malta and Cyprus will receive from the EU structural and cohesion funds, and the effects of additional investment

expenditure under these programmes, including partially matching funding from the Maltese and Cypriot governments. In the short-run scenarios, the 2004 allocations are used; in the long-run scenarios, the 2006 allocations are used. These figures are given to the Maltese and Cypriot governments as extra funds from abroad. The national government must match one third of the EU spending with it's own funds, which are financed through borrowing (i.e. the budget deficit increases). The total EU plus national government spending under these programmes are spent on construction, generating increased demand for that sector.

EU funding is found to be the most significant single source of welfare gain in both countries, although in both the short-run and long-run cases it represents less than half of the total welfare gain reported in column 1 of Table 7, and just over a quarter of overall welfare gains to Cyprus in the long-run (Table 8). The provision of extra finance from the EU has obvious and unambiguous effects. What is less obvious, but is transparent in the results in Table 7 and Table 8 is that the benefits of the extra funds are mixed with a substantial degree of structural change in the economy. In the short-run this scenario is responsible for far more job reallocation than any of the other scenarios except the total EU accession scenario in column 1, and for Cyprus, the productivity scenario in column 8. This is largely because EU structural funds must be matched with some internal funds to support infrastructural spending. This spending is mainly in the form of public consumption of construction services; so that there is a resource movement effect from other sectors into construction.

This resource movement effect (and the higher wages that induce that movement) is responsible for significant declines in tourism demand; by 3.07% and 0.66% in Malta (short-run and long-run) and by 0.38% and 0.25% in Cyprus. Notably, Malta, where funding allocations are larger relative to GDP, experiences greater reductions in tourism demand than Cyprus.

3.7 Productivity gains from investment programmes

Column 8 in Table 7 and Table 8 shows the possible effects that investment expenditures resulting from EU structural and cohesion funds will have through raising productivity in related sectors. The productivity increases are shown in Table 6. These productivity increases are doubled in the long-run scenario. The productivity improvements are applied in a neutral way to these sectors, so that they are not labour-substituting technology increases; rather they are intended as a way of introducing improved transport and utility infrastructure.

Table 6: Productivity Improvements Attributed to Structural Funding

Malta: Sectors affected	Productivity improvement	**Cyprus: Sectors affected**	Productivity improvement
Electricity	+2%	Electricity	+2%
Water	+2%	Water	+2%
Airline	+2%	Transport and storage	+2%
Airport	+2%		
'Other production and trade'	+1%		

The effect of productivity that is induced by spending on infrastructural projects has a relatively small but unambiguously positive effect on the Maltese economy, increasing welfare by 0.48% of incomes in the long-run. In Cyprus, the effects of productivity improvements follow a similar pattern, but are a little larger in magnitude than in Malta, and are the second largest source of welfare gain. Notably, despite the inclusion of specific tourism-related industry in the sectors directly affected in Malta (Table 6), tourism expenditures in Malta decline by small amounts but increase in Cyprus.

3.8 Trade and transactions costs and improved standards in tourism

Column 9 in Table 7 and Table 8 shows the effects that reduced trade and transactions costs and improved standards will have on tourism demand. Tourism demand will be stimulated by the same reasons as commodity exports (0.5 percent through reduced costs, 1 percent through improved standards) but the close links between EU tour operators, travel agents, airlines and the Maltese and Cypriot tourism sectors is likely to lead to further gains (2 percent) from these sources. A total 3.5 percent increase in tourism demand is introduced into the model to estimate the effects of reduced costs and improved standards in the tourism.

Tourism costs and standards have unambiguously positive effects on welfare, GDP and job creation. The size of the increase in tourism expenditure is large enough to offset falls in expenditures from other components of accession such as from trade costs and improved standards, which are comparable to this scenario which provides similar changes but as they relate to tourism businesses.

3.9 Additional tourism demand from stability

Column 10 in Table 7 and Table 8 shows the possible effects that membership of the EU will bring in terms of additional tourism demand. In addition to reduced costs and improved standards, there are other reasons why tourism demand in Malta may be stimulated by EU membership, chiefly because EU nationals perceive other EU countries as having less risk, particularly in relation to laws, standards and access to health services. An additional 5 percent increase in tourism demand from EU countries is introduced to account for these effects.

In a similar manner to tourism costs and standards, this tourism stimulus has unambiguously positive effects on welfare, GDP and jobs. It also provides a significant boost to tourism expenditures that offset some of the reductions from other parts of the accession programme.

Sensitivity Analysis

The results shown in Table 7 and Table 8 show the summary results of sensitivity analysis. Results where the coefficient of variation (CV) for a 95% confidence

interval is less than 0.1 are indicated by two asterisks (**), indicating that 95% of these cases would be expected to be between plus or minus ten percent from the central estimates shown. Results where the coefficient of variation is between 0.l and 1 (* in the tables) indicated that while we can be 95% confident in the sign of the result, we cannot be so confident as regards the magnitude of the result. All other results have a coefficient of variation greater than 1, indicating that we cannot be confident of either the sign or magnitude of the results.

Tourism expenditures do tend to have a CV greater than 0.1 but in general are less than 1. The only case where a CV greater than 1 occurs for tourism expenditures is for Malta in the short-run 'EU' case. In the 'tourism costs and standards' and 'tourism stimulus' columns tourism expenditure CVs are less than 0.1, showing a higher degree of certainty.

Table 9 shows the value of CV corresponding to the results shown in Table 8 for Cyprus.

Table 7: Macroeconomic Effects of Malta's Accession to the EU (=CV <.1; * = CV<.1)**

		EU	Maltese tariffs (non-EU)	Maltese tariffs (EU)	Market Entry	Trade costs	Improved Standards	EU Funding	Productivity	Tourism costs and standards	Tourism Stimulus
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under short-run assumptions											
Change in Tourism Expenditures	m. Lm	-3.610	-0.004	0.766*	-6.990*	-1.660*	-2.25**	-9.820*	-0.447*	6.807**	9.592**
(as % of original expenditures)	%	-1.13	0.00	0.24*	-2.19*	-0.52*	-0.7**	-3.07*	-0.14*	2.13**	3**
GDP	m. Lm	8.916**	-0.350*	-0.058	0.505*	0.831**	0.405**	2.172*	2.986**	1.173**	1.644**
(% of original GDP)	%	0.55**	-0.02*	0.00	0.03*	0.05**	0.02**	0.13*	0.18**	0.07**	0.1**
Equivalent Variation	m. Lm	82.991**	-0.357*	-0.399	14.349**	7.963**	5.532**	46.764**	3.168**	3.322**	4.685**
(% of original income)	%	7.44**	-0.03*	-0.04*	1.29**	0.71**	0.5**	4.19**	0.28**	0.3**	0.42**
Government Revenues	m. Lm	7.219**	0.322**	1.563**	1.602**	0.846**	0.611**	1.238*	0.31**	0.351**	0.494**
Net Change in FTE Jobs	no.	-355*	44*	416**	-255*	-94*	-103**	-688**	-65*	123*	172*
(% of original FTE jobs)	%	-0.26*	0.03*	0.3**	-0.18*	-0.07*	-0.07**	-0.498**	-0.05*	0.09*	0.12*
FTE Jobs lost	no.	3631**	146*	380**	1718**	332**	383**	3345**	239*	264**	371**
(% of original FTE jobs)	%	2.63**	0.11*	0.28**	1.24**	0.24**	0.28**	2.423**	0.17*	0.19**	0.27**
Under long-run assumptions											
Change in Tourism Expenditures	m. Lm	-5.5**	-2.700*	-7.240*	-6.760*	-3.100*	-3.520*	-2.112*	-0.095*	10.424**	14.73**
(as % of original expenditures)	%	-1.72**	-0.85*	-2.27*	-2.12*	-0.97*	-1.10*	-0.66*	-0.03*	3.27**	4.61**
GDP	m. Lm	63.507**	4.018*	17.857	15.161*	8.474*	5.933**	6.217*	5.36**	1.828**	2.583**
(% of original GDP)	%	3.9**	0.25*	1.10	0.93*	0.52**	0.36**	0.38*	0.33**	0.11**	0.16**
Equivalent Variation	m. Lm	160.12**	5.105*	20.445*	26.352**	16.473*	11.789**	56.501**	5.358**	2.471**	3.498**
(% of original income)	%	14.36**	0.46*	1.83*	2.36**	1.48**	1.06**	5.07**	0.48**	0.22**	0.31**
Government Revenues	m. Lm	14.428**	1.009**	4.293**	3.113**	1.786**	1.304**	0.792**	0.561**	0.246**	0.348**
Net Change in FTE Jobs	no.	3559**	36	761**	737*	283	325*	-956**	62*	159*	224*
(% of original FTE jobs)	%	2.58**	0.03	0.55**	0.53*	0.2**	0.24*	-0.692**	0.05*	0.12*	0.16*
FTE Jobs lost	no.	6475**	1081**	2426**	1493**	412	656**	2250**	337*	274**	387**
(% of original FTE jobs)	%	4.69**	0.78**	1.76**	1.08**	0.3**	0.48**	1.63**	0.24*	0.2**	0.28**

Table 8: Macroeconomic Effects of Cypriot Accession to the EU (=CV <.1; * = CV<.1)**

		EU	Cypriot tariffs (non-EU)	Cypriot tariffs (EU)	Market Entry	Trade costs	Improved Standards	EU Funding	Productivity	Tourism costs and standards	Tourism Stimulus
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under short-run assumptions											
Change in Tourism Expenditures	m. CYP	81.58**	6.34*	11.65*	-0.75*	-1.57*	-2.76*	-5.27*	1.67*	30.56**	43.16**
(as % of original expenditures)	%	5.90**	0.46*	0.84*	-0.05*	-0.11*	-0.20*	-0.38*	0.12*	2.21**	3.12**
GDP	m. CYP	15.33*	11.78*	-24.06*	0.28*	0.29	1.42**	-18.78**	19.70**	2.84**	3.98**
(% of original GDP)	%	0.25*	0.19*	-0.39*	0.01*	0.01	0.02**	-0.30**	0.32**	0.05**	0.06**
Equivalent Variation	m. CYP	134.74**	1.51	-42.47*	5.51**	17.38**	14.28**	67.36**	17.06**	13.86**	19.61**
(% of original income)	%	2.34**	0.03	-0.74*	0.10**	0.30**	0.25**	1.17**	0.30**	0.24**	0.34**
Government Revenues	m. CYP	-50.53**	-26.23*	-111.06*	1.16**	1.08*	1.80**	35.90**	1.95**	3.56**	5.03**
Net Change in FTE Jobs	no.	124	-121*	-70	25*	8	-34*	-268*	-7	234*	329*
(% of original FTE jobs)	%	0.04	-0.04*	-0.02	0.01*	0.00	-0.01*	-0.09*	0.00	0.07*	0.11*
FTE Jobs lost	no.	2,851**	815**	2,241*	289**	356**	412**	1,957**	495*	635**	893**
(% of original FTE jobs)	%	0.91**	0.26**	0.71*	0.09**	0.11**	0.13**	0.62**	0.16*	0.20**	0.28**
Under long-run assumptions											
Change in Tourism Expenditures	m. CYP	93.61**	5.96*	8.79*	-0.45*	-2.06*	-4.15*	-3.39*	5.90*	35.63**	50.35**
(as % of original expenditures)	%	6.77**	0.43*	0.64*	-0.03*	-0.15*	-0.30*	-0.25*	0.43*	2.58**	3.64**
GDP	m. CYP	217.05**	64.86*	30.64*	3.43**	14.73*	16.35**	4.40*	65.38**	5.40**	7.67**
(% of original GDP)	%	3.49**	1.04*	0.49*	0.06**	0.24*	0.26**	0.07*	1.05**	0.09**	0.12**
Equivalent Variation	m. CYP	315.20**	54.18*	15.00*	8.76**	32.93**	31.56**	82.29**	55.39**	8.92**	12.70**
(% of original income)	%	5.48**	0.94*	0.26*	0.15**	0.57**	0.55**	1.43**	0.96**	0.16**	0.22**
Government Revenues	m. CYP	17.60*	-15.04*	-120.33*	1.54**	5.03*	7.40**	69.41**	9.38**	2.94**	4.18**
Net Change in FTE Jobs	no.	3,581*	857*	2,117*	145*	500*	389*	155*	212*	230*	326*
(% of original FTE jobs)	%	1.14*	0.27*	0.67*	0.05*	0.16*	0.12*	0.05*	0.07*	0.07*	0.10*
FTE Jobs lost	no.	2,468*	924*	2,525*	387*	371**	464**	1,099**	1,541*	594**	835**
(% of original FTE jobs)	%	0.78*	0.29*	0.80*	0.12*	0.12**	0.15**	0.35**	0.49*	0.19**	0.27**

Table 9: Macroeconomic Effects of Cypriot Accession to the EU: 95% Coefficients of Variation

	EU	Cypriot tariffs (non-EU)	Cypriot tariffs (EU)	Market Entry	Trade costs	Improved Standards	EU Funding	Productivity	Tourism costs and standards	Tourism Stimulus
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under short-run assumptions										
Change in Tourism Expenditures	0.048	0.249	0.242	-0.260	-0.269	-0.238	-0.240	0.273	0.059	0.059
(as % of original expenditures)	0.048	0.249	0.242	-0.260	-0.269	-0.238	-0.240	0.273	0.059	0.059
GDP	0.183	0.360	-0.393	0.191	3.495	0.097	-0.016	0.005	0.084	0.085
(% of original GDP)	0.183	0.360	-0.393	0.191	3.495	0.097	-0.016	0.005	0.084	0.085
Equivalent Variation	0.020	4.924	-0.262	0.028	0.040	0.022	0.011	0.021	0.063	0.064
(% of original income)	0.020	4.924	-0.262	0.028	0.040	0.022	0.011	0.021	0.063	0.064
Government Revenues	-0.069	-0.110	-0.114	0.092	0.618	0.096	0.012	0.074	0.082	0.082
Net Change in FTE Jobs	1.404	-0.299	-1.132	0.680	2.340	-0.447	-0.171	-17.319	0.163	0.163
(% of original FTE jobs)	1.404	-0.299	-1.132	0.680	2.340	-0.447	-0.171	-17.319	0.163	0.163
FTE Jobs lost	0.075	0.079	0.140	0.067	0.094	0.087	0.059	0.105	0.084	0.084
(% of original FTE jobs)	0.075	0.079	0.140	0.067	0.094	0.087	0.059	0.105	0.084	0.084
Under long-run assumptions										
Change in Tourism Expenditures	0.023	0.360	0.343	-0.375	-0.330	-0.314	-0.316	0.326	0.020	0.020
(as % of original expenditures)	0.023	0.360	0.343	-0.375	-0.330	-0.314	-0.316	0.326	0.020	0.020
GDP	0.063	0.235	0.268	0.085	0.124	0.068	0.148	0.035	0.079	0.079
(% of original GDP)	0.063	0.235	0.268	0.085	0.124	0.068	0.148	0.035	0.079	0.079
Equivalent Variation	0.042	0.291	0.498	0.043	0.055	0.037	0.013	0.049	0.074	0.073
(% of original income)	0.042	0.291	0.498	0.043	0.055	0.037	0.013	0.049	0.074	0.073
Government Revenues	0.323	-0.362	-0.165	0.079	0.278	0.056	0.004	0.065	0.057	0.057
Net Change in FTE Jobs	0.217	0.375	0.208	0.176	0.138	0.167	0.287	0.738	0.119	0.118
(% of original FTE jobs)	0.217	0.375	0.208	0.176	0.138	0.167	0.287	0.738	0.119	0.118
FTE Jobs lost	0.204	0.270	0.237	0.122	0.093	0.083	0.035	0.165	0.065	0.065
(% of original FTE jobs)	0.204	0.270	0.237	0.122	0.093	0.083	0.035	0.165	0.065	0.065

Figure 8: Equivalent variation as a percentage of base income

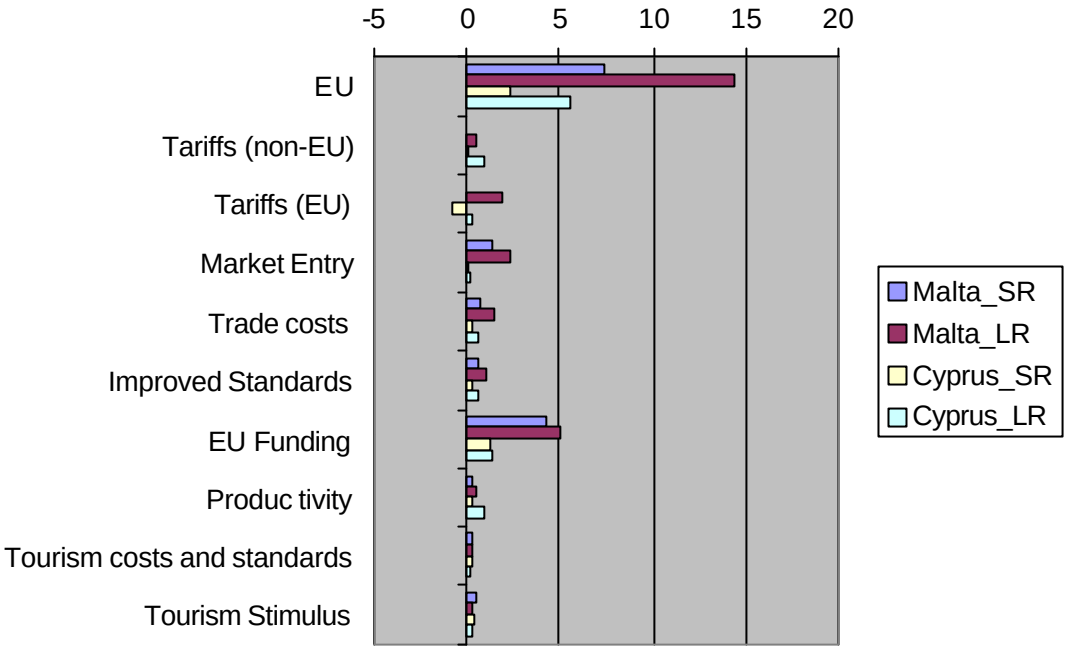
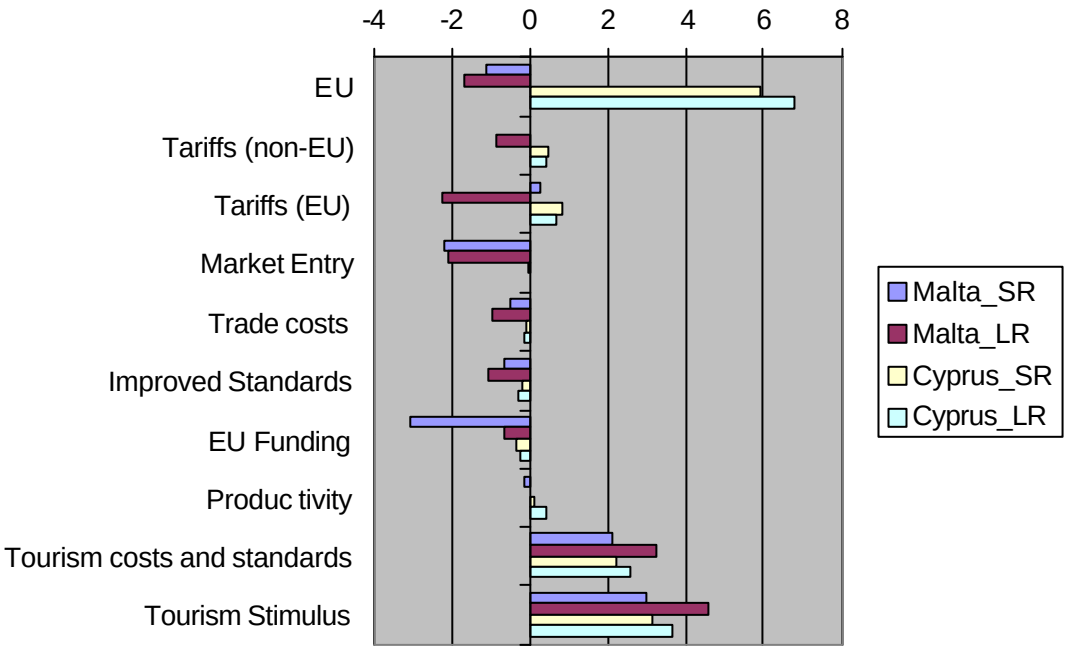


Figure 9: Percentage change in Tourism Expenditures



4 Conclusions

EU membership is found to have negative effects on tourism expenditures in Malta, but positive effects on tourism expenditures in Cyprus. The reasons for these differences are not that the individual components of accession work in different directions, but that they have different relative magnitudes (see Figure 8 and Figure 9). The exception to this statement is for Maltese and Cypriot tariff reductions, where reductions in Maltese tariffs reduce tourism demand in the long-run but increase tourism demand in Cyprus in the long-run.

For entry into EU markets, reductions in trade costs, and improved standards, which all directly stimulate commodity exports, tourism expenditures fall in both countries; but the magnitude of that change is much more pronounced in Malta than in Cyprus, and this can be attributed to the larger share of exports in GDP in Malta.

EU funding and associated productivity gains are found to reduce tourism expenditures in both countries. The magnitudes are similar in the long-run, but in the short-run the reduction is much larger Malta than Cyprus; this is largely because Maltese funding allocations are more significant in relation to the size of the economy than they are in Cyprus.

The final two components of EU accession that have been modelled relate to increases in tourism demand stimulated by EU accession. Firstly, a similar reasoning to that used for product trade cost reductions and improved standards is applied to tourism; finally, the effects that being inside the EU has in terms of stimulating tourism demand in itself because of perceived stability are modelled. These components of accession are found to increase tourism expenditures.

While the first seven components of accession tend (with some exceptions) to reduce tourism expenditures, the final two components act to offset this effect. In Malta, the negative effect of trade- and funding-related components on tourism expenditures outweighs the increases in tourism in the final two components. In Cyprus, the negative effects of trade- and funding-related components are smaller than in Malta, so that the positive effects on tourism outweigh the components that reduce tourism expenditures.

Tourism expenditures are likely to decline in Malta, albeit by fairly modest rates of around 1% to 2% as a result of EU accession. Tourism expenditures in Cyprus are likely to increase by around 5% to 7%. The difference is largely because Malta, being a more open economy, benefits to a greater extent from the overall package of EU membership.

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