Quantifying the Impact of a Transatlantic Trade and Investment Partnership (T-TIP) Agreement on Portugal

Final Project Report

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Executive summary

In the wake of the recent financial crisis, in 2013 the European Union and the United States launched a joint, ambitious effort to boost their respective economies through a comprehensive trade and investment agreement. Known as the Transatlantic Trade and Investment Partnership Agreement (T-TIP), the negotiations process that has followed, and that indeed is still on going, is supposed to bring about tariff-free trade in goods, reduction of non-tariff barriers (NTBS) for goods and services, and liberalization of public procurement markets for the transatlantic market. This study examines the economic impact of a successful T-TIP agreement on the economy of Portugal.

At this stage, the shape and coverage of a final T-TIP agreement remain uncertain. It needs to take into account particularities of a great number of different partners and thus on substance amounts to a new type of mini-lateral agreement. It also needs to cover areas ranging from broad tariff concessions to sector-specific questions of regulation. While tariff reductions are relatively straightforward since it is basically a political decision without major implementation issues, an important ambition under T-TIP actually relates to greater coherence and convergence of regulatory standards. Such an institutional mechanism might have strong implications for a broader set of countries that are also grappling with regulatory barriers to trade and investment. While the goal of regulatory convergence (and better cross-recognition of standards) is a part of this venture, it requires enhanced cooperation in rule making. As such it is not as straightforward as tariff elimination. Indeed, there is growing recognition that a successful T-TIP agreement would combine immediate liberalization in some areas (such as tariffs) with institutional mechanisms set up to allow progressive, long-run liberalization in others. For this reason it is important to understand relatively immediate effects from tariff elimination, separately from likely longer run effects as trade cost reductions linked to NTBs are realized.

Given the complexities and uncertainties involved, the approach taken in this study is to examine scenarios involving varying levels of liberalization for NTBs. We also examine the potential impact of tariffs (where liberalization may be relatively immediate) separate from those for NTBs (which may be liberalized more gradually). Our assessment is centred on a quantitative model of the world economy.

It is likely that under the final agreement, tariffs will be eliminated first, while NTB reduction will be more gradual. We find that tariff elimination is far more important for Portugal than it is for the EU as a whole. Because of this, Portugal is likely to benefit proportionately more from tariff reductions than the EU as a whole, and Portugal is likely to benefit much earlier, and to a greater extent, from the first stages of T-TIP implementation.

Modeling assumptions

The basic methodological approach followed in this study involves the use of a computational model of the world economy (known as a CGE model). This model has

been used to look at alternative T-TIP scenarios. We have supplemented the CGE-based analysis with market focused (partial equilibrium) modelling of more detailed sectors than those identifiable in the CGE model. The model is based on the one used for recent European Commission assessments of T-TIP and the EU-Canada FTA[1]

Alternative scenarios in terms of the outcome of T-TIP have been analysed given uncertainty about what exactly the agreement will incorporate and when these features of the agreement will be implemented. It should again be stressed that in contrast to reducing tariffs, the removal of NTBs is not as straightforward. There are many different reasons and sources for NTBs. Some are unintentional barriers while others reflect deliberate public policy. As such, for many NTBs, removing them is not possible because, for example, they require constitutional changes, unrealistic legislative changes, or unrealistic technical changes. Removing NTBs may also be difficult politically, for example because there is a lack of sufficient economic benefit to support the effort; because the set of regulations is too broad; or because consumer preferences or language preclude a change. In recognition of these difficulties, we follow recent studies by focusing on the set of possible NTB reductions (known as "actionable" NTBs)[2] given that many will remain in place. Of those NTBs that can feasibly be reduced, we focus on different levels of ambition for NTB reduction.

Our scenarios range from a relatively shallow agreement on tariffs, combined with modest NTB liberalization at one extreme, and a deep agreement covering tariffs and ambitious NTB reductions. These scenarios do not mean that we believe one of these is particularly likely or even preferred. Rather they serve to frame the questions covered in the report.

1. *Modest scenario (Tariffs and modest NTB liberalization*): Under this scenario, we assume that 20 % of trade costs from actionable NTBs (those that can be reduced) actually are eliminated. We also assume that with modest NTB cost reductions, these are discriminatory. Hence US liberalization would only benefit EU firms, and vice-versa.

2. *Ambitious scenario* (*Tariffs and ambitious NTB liberalization*): Under this scenario, we assume that 50 % of costs from actionable NTBs (those that can

[1] Ecorys (2009). *Non-Tariff Measures in EU-US Trade and Investment – An Economic Analysis*. Report prepared for European Commission, Directorate-General-for -Trade, Reference: OJ 2007/S 180N219493.

CEPR (2013). *Assessment of a Reduction of Barriers to Trade and Investment between the EU and the US*, Centre For Economic Policy Research, report prepared for the European Commission. European Commission and the Government of Canada (2009). *Assessing the Costs and Benefits of a Closer EU-Canada Economic Partnership*, joint report, Brussels and Ottawa.

[2] Actionability is the degree to which an NTB or regulatory divergence can realistically be reduced (via various means and techniques) if the political will to do so exists. To define actionability, the Ecorys (2009) study used expert opinions and crosschecks with regulators, legislators and businesses, supported by the business survey. The figures on actionability should be interpreted with some caution given the difficulty of providing exact measure of the extent of actionability.

be reduced) are eliminated. We also assume that not all of these NTB cost reductions are discriminatory. This reflects what are called "regulatory spillovers." Basically, with a deep agreement on NTBs, we assume that third countries will also benefit, but to a more limited extent, in terms of some improvement in market access. The logic is that, with deep regulatory reform, at least some of the changes are likely to affect all players, and not just the EU and US firms. For example, where the US recognizes EU standards, firms in other countries might then find it easier to then meet US standards themselves if they already meet EU standards.

Summary of the scenarios

Full Implementation (long-run effects): • Focuses on year 2030, with full effects of implementation • Includes longer run investment changes and reallocation of capital across sectors. • Labour markets in Portugal have further recovered from the impact of recession.	Long-run effects of an agreement that has been fully implemented.
Modest Scenario	98 % of tariffs eliminated, 10 % of NTBs (20 % of actionable NTBs) are eliminated
Ambitious Scenario	100 % of tariffs and 25 % of NTBs (50 % of actionable NTBs) are eliminated
Initial Stages of Implementation (short-run effects): • Excludes longer run investment changes and reallocation of capital across sectors. • Labour markets in Portugal reflect current conditions with high unemployment (soft labour markets)	Assuming that the modest scenario represents the first stages of an ambitious agreement -- 98 % of tariffs eliminated, 10 % of NTBs (20 % of actionable NTBS) are eliminated

Note: Following CEPR (2013) we assume 20% and 50% reductions in actionable NTBs. This translates into roughly 10% and 25% of all NTBs, with some variation across sectors. See CEPR (2013)[3] for further discussion.

Findings from Economic Modelling

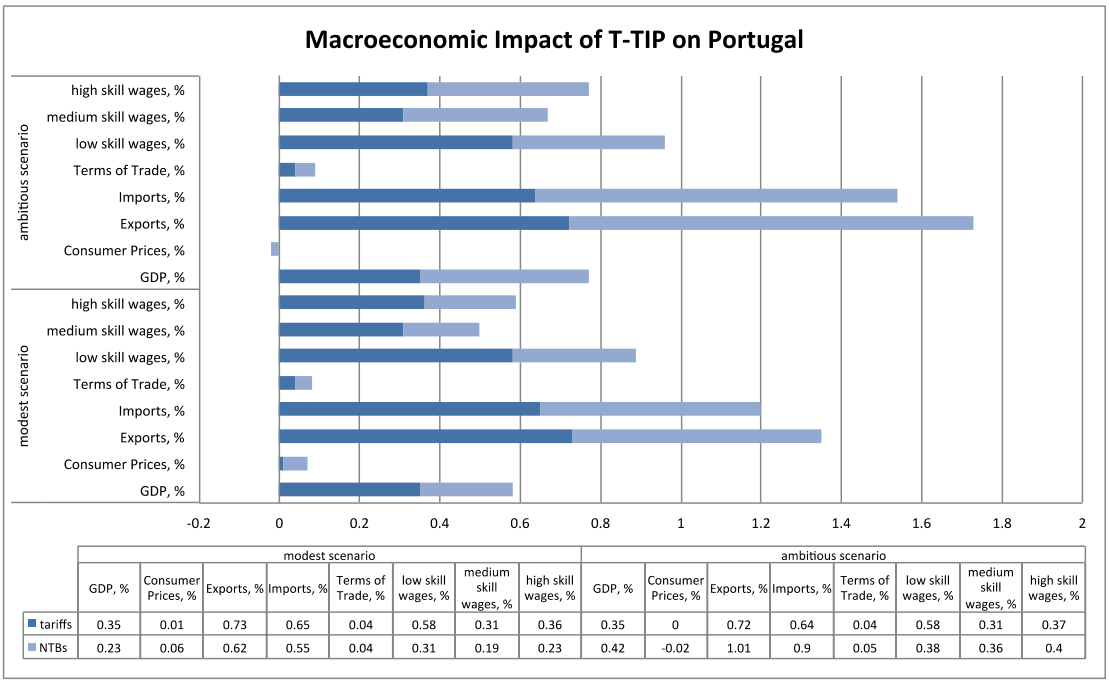
- In contrast to the EU as a whole, where NTBs are the most important element of a T-TIP, for Portugal tariffs are just as important as NTB cost reductions.
- Because Portugal benefits proportionately more from tariff reductions than the EU as a whole, Portugal is likely to benefit earlier, and to a greater extent, from the initial stages of T-TIP implementation.
- Over the short-run, in case of the initial stages of the implementation assuming a modest scenario, the estimated impact for Portugal is 0.66% of GDP.

[3] CEPR (2013)" Assessment of a Reduction of Barriers to Trade and Investment between the EU and the US", (TRADE10/A2/A16)

- Long-run impacts for Portugal under core scenarios in the study range from 0.57% of GDP under a shallow agreement to and 0.76% of GDP under a deep agreement.

Macroeconomic estimates of the baseline long-run scenario (year 2030, including some impact on employment) are summarized in the figure and table below. Portugal would benefit under both the ambitious and modest scenario over the long-run. An important part of the gains stems from tariff liberalisation. This contrasts with the EU as a whole (see CEPR 2013) where tariffs are less important. The reason is that, in the case of Portugal, exports are more concentrated in sectors that would benefit from elimination of high US import tariffs. For example, textiles and clothing are 15.5 % of Portuguese goods exported to the US and face an 8.8 % tariff, but this sector only accounts for 2.4 % of goods exports for the EU as a whole. In addition, 25% of Portuguese value added being exported, with most of this being exported through the manufacturing sector, resulting in an important impact on the Portuguese economy coming through liberalisation affecting the manufacturing sectors. Tariffs are likely to be reduced first (i.e. they will be front loaded) while NTB reductions will take longer. Because Portugal benefits proportionately more from tariff reductions than the EU as a whole, Portugal is likely to benefit earlier, and to a greater extent, from the initial stages of T-TIP implementation.

Under an ambitious agreement, national income is higher by €1.6 billion annually in the year 2030 under our baseline scenario. Of this, roughly half comes from tariffs and half from NTBs. Aggregate exports and imports are estimated to increase by around 1.5-1.7% under the ambitious scenario. Wages are also expected to increase, with low skill wages increasing slightly more under both ambitious and modest scenarios.



	modest scenario								ambitious scenario							
	GDP, %	Consumer Prices, %	Exports, %	Imports, %	Terms of Trade, %	low skill wages, %	medium skill wages, %	high skill wages, %	GDP, %	Consumer Prices, %	Exports, %	Imports, %	Terms of Trade, %	low skill wages, %	medium skill wages, %	high skill wages, %
tariffs	0.35	0.01	0.73	0.65	0.04	0.58	0.31	0.36	0.35	0	0.72	0.64	0.04	0.58	0.31	0.37
NTBs	0.23	0.06	0.62	0.55	0.04	0.31	0.19	0.23	0.42	-0.02	1.01	0.9	0.05	0.38	0.36	0.4

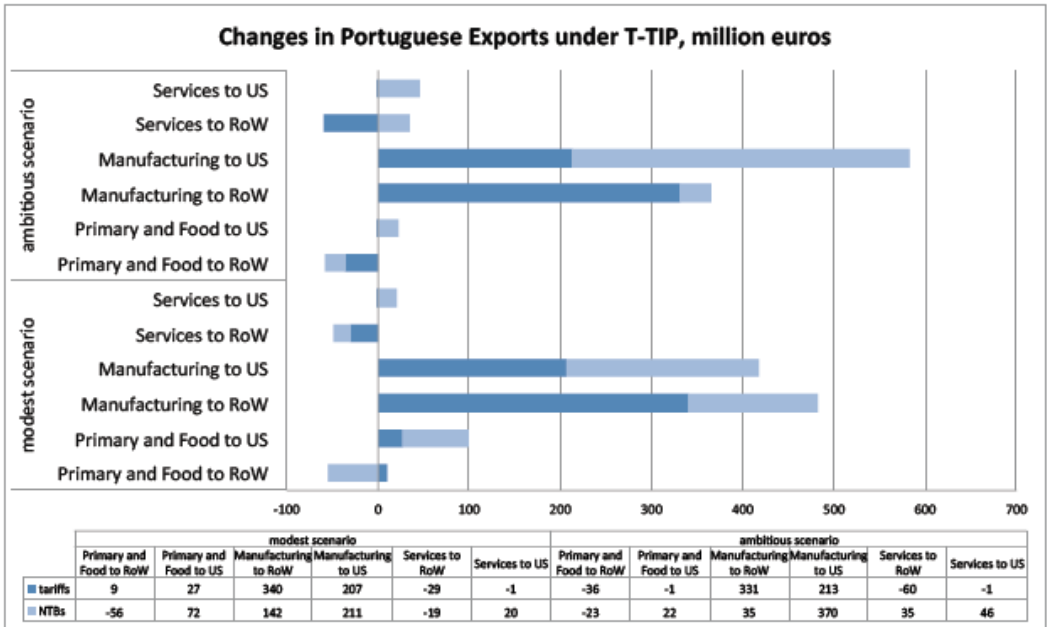
Source: CGE model estimates in this study, 2030 baseline.

Sector effects[4] will vary across different sectors, with electric machinery and textiles and apparel standing out. Output in textiles and apparel would increase by around 18% over the long-run, with electric machinery contracting by around 10-12% at the same time. In part, changes in electric machinery production reflect recent estimates for the European industry as a whole (See for example CEPR 2013 and ECORYS 2009). At a European level, the electric machinery sector is part of a European industry that from earlier studies we expect to be on the downside of adjustment across continental Europe. In the Portuguese case, we find that expansion in other manufacturing sectors is especially important in pulling resources out of the electrical machinery sector. Indeed parallel to these output changes, exports in textiles and apparel would increase by around 30% and would decline by about 13-15% in electric machinery. The increase in aggregate exports in textiles and apparel is mostly driven by a large increase in bilateral exports to the US. Exports in this sector to the US increase due to the underlying trade structure and the initially relatively high barriers on US imports, including tariffs.

Export effects are expected to be concentrated on manufacturing. The forces driving this change are complex. They include not only directly improved access to the US, but the fact that Portugal's customers in the EU (who may source parts and components in Portugal) may also demand more goods from Portugal. In addition, within the EU, shifts in industrial structure in other Member States will also lead to a rebalancing of EU demand for Portuguese exports. The net effects, as summarized below, are substantial growth in exports to the US (estimated as an increase in exports to the US by up to €650 million by 2030) but also to third countries (with total annual exports expanding by roughly €930 million by 2030).

Employment: The study also considers possible impacts on employment in Portugal. Assuming that an agreement will yield immediate tariff cuts and modest NTB reductions up front, and deeper reductions in NTBs only over a longer time horizon, it is estimated that T-TIP could yield 40.5 thousand jobs in the first stages of implementation (given currently soft labour markets) and 23.0 thousand in the longer term with full implementation (modelled in the year 2030).

[4] These estimated changes are due to implementation of T-TIP while there could be other external shocks, such as policy changes, which could lead to shifts in Portugal's trade and production structures changing the results presented here.



	modest scenario						ambitious scenario					
	Primary and Food to RoW	Primary and Food to US	Manufacturing to RoW	Manufacturing to US	Services to RoW	Services to US	Primary and Food to RoW	Primary and Food to US	Manufacturing to RoW	Manufacturing to US	Services to RoW	Services to US
tariffs	9	27	340	207	-29	-1	-36	-1	331	213	-60	-1
NTBs	-56	72	142	211	-19	20	-23	22	35	370	35	46

Source: CGE model estimates in this study, 2030 baseline. RoW=rest of world

The report also looks at the effects of an immediate implementation of the T-TIP with the labour markets reflecting current conditions with high unemployment and assuming the modest liberalisation scenario given that realistically a more ambitious scenario would require a longer time-frame to implement. The estimated impact under this scenario is a total of 0.66% increase in GDP. The potential impact comes both from NTB reductions on goods and tariff reductions. The resulting increase in national income would be €1.16 billion. In addition, aggregate exports and imports are estimated to increase by around 1-1.3 % over the short-run.

For the *Azores*, gross value added in million euros would increase from about €3279 million to €3289 million under the ambitious with a 0.35% increase in Azores' GDP. Parallel to these changes, there would be a substantial increase in bilateral trade in manufacturing with the US, mainly attributable to increased trade in processed food and primary products.

As T-TIP is fully implemented, it has been estimated that *port traffic* would also increase in a range from 1.0 to 1.8 %.

Findings from Partial Equilibrium Modelling: The partial equilibrium analysis looked at the potential impact of removal of barriers to trade in certain wine, footwear, pharmaceutical, textiles and clothing, and machinery products. The results indicate that the most pronounced change in terms of both output (1-2.5 % increase) and exports to the US (222-540 % increase) would take place in certain footwear products. This is mainly due to the initial very high tariffs the US puts on these product categories.

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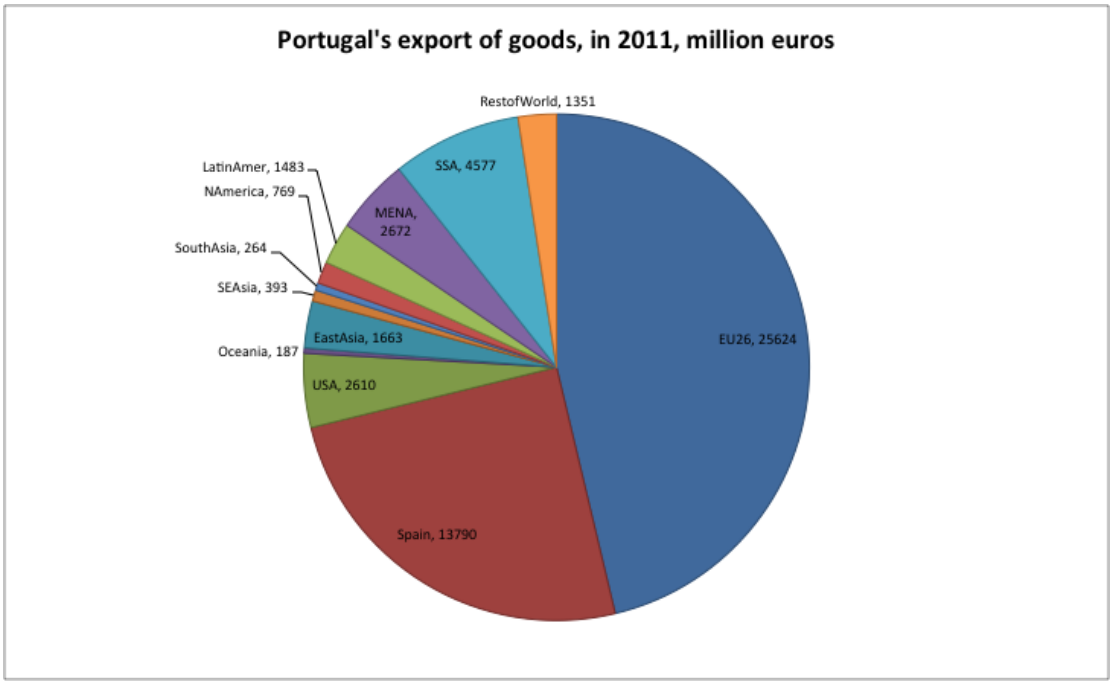
1 Background and Context

The potential impact of T-TIP on the Portuguese economy is influenced by several factors. Most important among these factors are the direction of trade and the structure of the Portuguese economy itself, as well as the economic policy changes stemming from the T-TIP. In order to provide a better understanding about how the trade and the structure of the economy can influence the outcomes, we start here with an overview of the underlying economic structure.

1.1 PORTUGUESE TRADE STRUCTURE

Figure 1 and Figure 2 depict Portugal's export of goods and services by destination. The US and the EU are among the top ranking trade partners for Portugal as can be seen from the figure. Thus any agreement affecting the trade relations between the two is likely to have an important impact on the Portuguese economy. When looking at Portuguese export patterns to the US, one can see that the share in exports of services to the US is somewhat higher than the share of goods. Given that more than half of exports, both in services and goods, are destined for the EU market, any trade agreement affecting conditions of competition (for example a stronger presence of US firms) in EU markets is likely to have, apart from a direct impact, also a significant indirect effect on the Portuguese economy through changes in trade structures and output in other EU member states.

Figure 1 Portugal's export of goods by destination

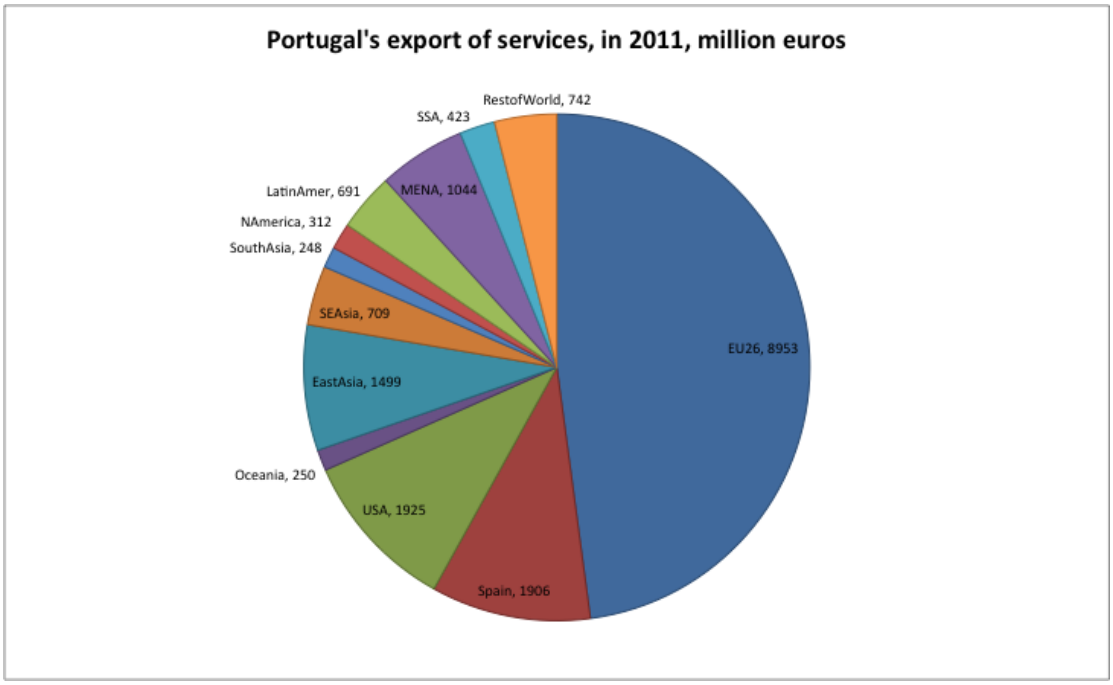


Source: Own calculations from Gtap9. See definition of regions in Annex.

A further decomposition of the Portuguese export structure by sectors is provided in

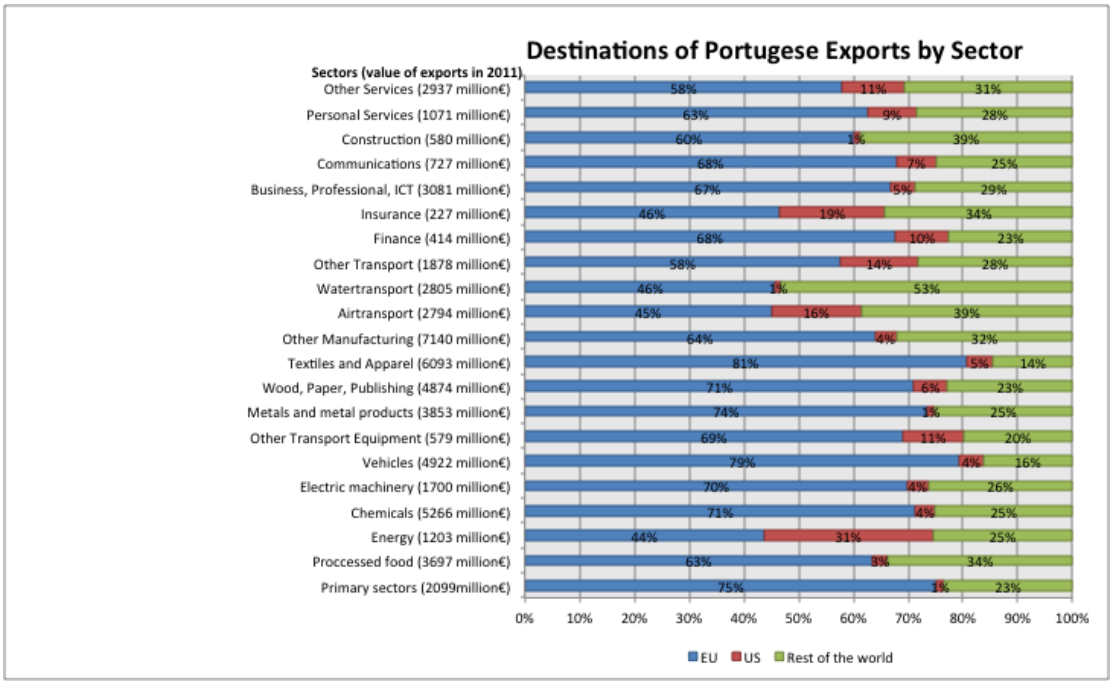
Figure 3. Sectors with the highest share of exports destined for the EU markets are Vehicles, and Textiles and Apparel with about 80% of total exports going to the EU. In these sectors the share of exports to the US is relatively small, being around 4-5 %. Nevertheless, given the magnitude of the exports to the EU, and the relatively high initial barriers, these sectors could potentially be significantly affected by the T-TIP.

Figure 2 Portugal's export of services by destination



Source: Own calculations from Gtap9.

Figure 3 Destination of Portuguese Exports by sector



Source: Own calculations from Gtap9.

Among the services sectors, Insurance is the sector where the US has the highest share in total Portuguese exports, with 19% of exports going to the US. This is followed by transport sectors and other services. Energy exports to the US stand out.

1.2 PORTUGUESE VALUE ADDED STRUCTURE

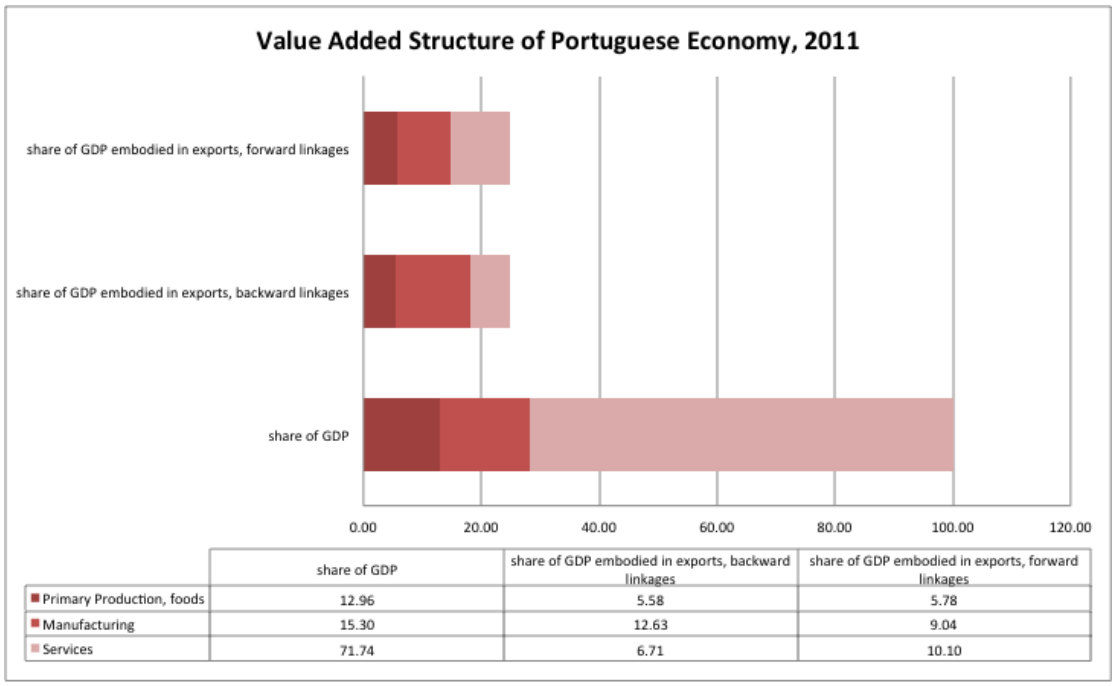
Like other high-income countries, Portugal is services-intensive in terms of value added (meaning employment and capital) but goods-intensive in terms of trade. In addition, primary production and food is also relatively important for trade compared to its importance for value added. Figure 4 provides a summary for 2011 of the value added structure of the Portuguese economy.

The figure shows three measures of the contribution of sectors to trade and GDP. The first is simply the share of value added (the basis for the value of national income) across primary production and food, manufacturing, and services. On this basis, services contributed 71.7% to Portugal's GDP, while manufacturing contributed 15.3% and primary production and food 12.9 %.

In addition to GDP allocations across sectors, throughout this section we will also refer to economic *linkages*. By this, we mean the extent to which output from one sector then feeds into another sector. This flow of output of goods and services is the basis for the concept of "value chains" linking the activities (value added) in sectors at various stages of processing, leading ultimately to the final output of goods and services. When one focuses on the downstream flow of output to final output – for example steel sold to motor vehicles production and to construction – this is referred to as forward linkages. So in this case we focus, from a given sector's 'viewpoint', on which further sectors this given sector feeds into. When we instead examine the original sectors providing value added to final output in a given sector – for example steel, electricity, engineering services, and machinery all feeding into motor vehicle production – this is referred to instead as backward linkages. In other words, in this case, from a given sector's 'viewpoint', we focus on what other sectors were used in the production in this given sector. Backward linkages help to identify the importance of workers and

production in upstream firms contributing to final output.[5] Linkages are an important feature in the model of production and trade – the CGE model – discussed later in this report.

Figure 4 Value added structure of the Portuguese Economy



	share of GDP	share of GDP embodied in exports, backward linkages	share of GDP embodied in exports, forward linkages
Primary Production, foods	12.96	5.58	5.78
Manufacturing	15.30	12.63	9.04
Services	71.74	6.71	10.10

Source: Own calculations from Gtap9.

The contribution of exports to GDP, based both on forward linkages and on backward linkages, is provided in Figure 4. Starting with backward linkages, 12.63% of Portugal's GDP (jobs and capital services) was exported through manufacturing goods. Services exports accounted for another 6.71%, while primary sector for about 5.58%. In the case of manufacturing, these figures include not only value added within manufacturing, but also value added from services that feed into manufacturing output. In total, 25% of Portuguese value added is exported. Most of this is exported through the manufacturing sector.

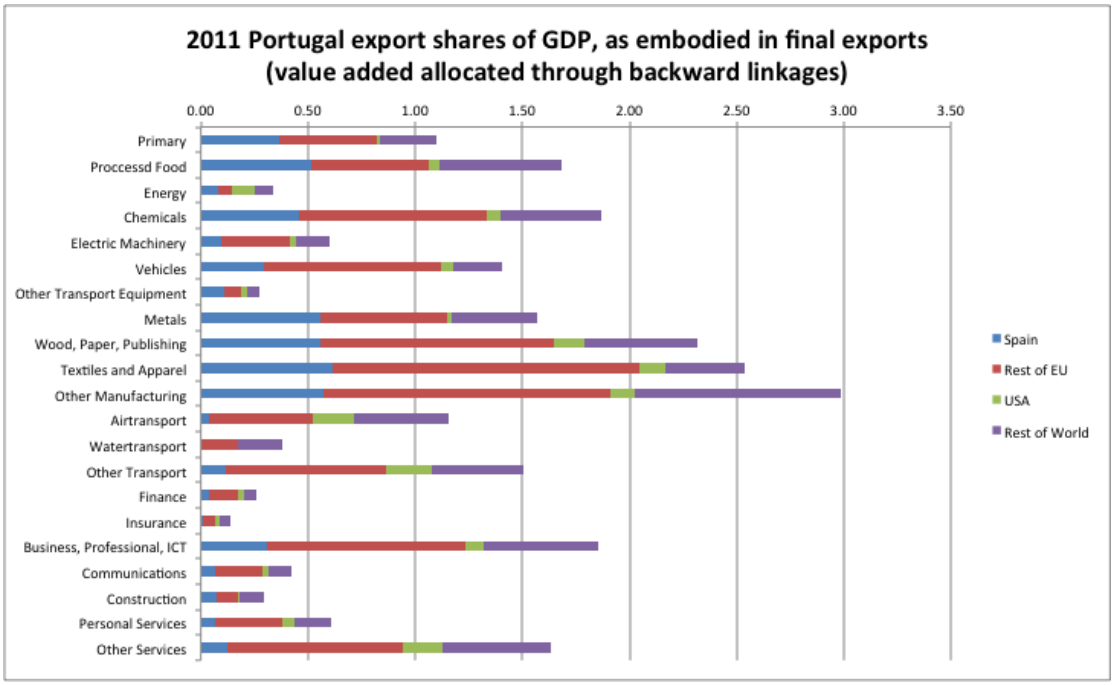
While manufacturing accounts for most of Portuguese value added contained in exports, an important part of this actually comes through inputs from the service

[5] For a technical discussion on the definition of these concepts and their calculation from national input-output data, see Francois, Manchin, and Tomberger (2013) and Christen et al (2013). Here, in this section we work with the GTAP9 database, which is benchmarked to the global economy in 2011.

sector to manufacturing production. This is clear when we look at the last set of data in Figure 4 on forward linkages. Here, we see that 10% of Portuguese GDP, located in the service sector is embodied in exports of goods and services. This figure points to the important role the service sector plays in Portugal as an intermediate input to goods production.

A further breakdown on the relative importance of value added (mostly manufacturing and services) to Portuguese exports is provided in Figure 5 and Figure 6. Figure 5 is based on backward linkages. Three sectors stand out as especially important – Wood, Paper, Publishing; Textiles and Apparel; and Other Manufacturing. All three sectors' exports account for over 2% of GDP each (almost 8% of GDP combined). From the services sectors the most important ones in terms of backward linkages are Business, Professional, ICT; and Other services, both accounting for more than 1.5% of GDP. Most of these exports are destined for the EU.

Figure 5 Portugal export shares of GDP, as embodied in final exports

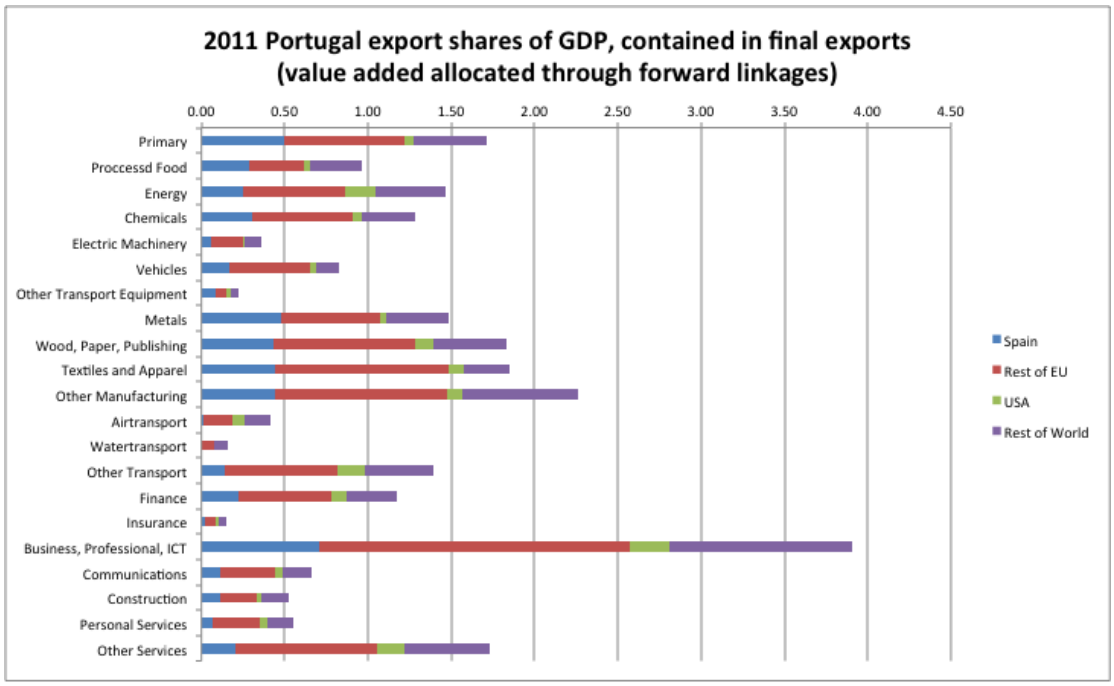


Source: Own calculations from Gtap9.

Figure 5 is based on forward linkages. This is informative because it sheds light on the value added embodied in Portuguese exports from mostly manufacturing

and services, in terms of activities that serve as inputs to those goods and services that are actually exported. Here the most important sector that stands out is Business, Professional, and ICT, with almost 4% of GDP.

Figure 6 Portugal export shares of GDP, contained in final exports



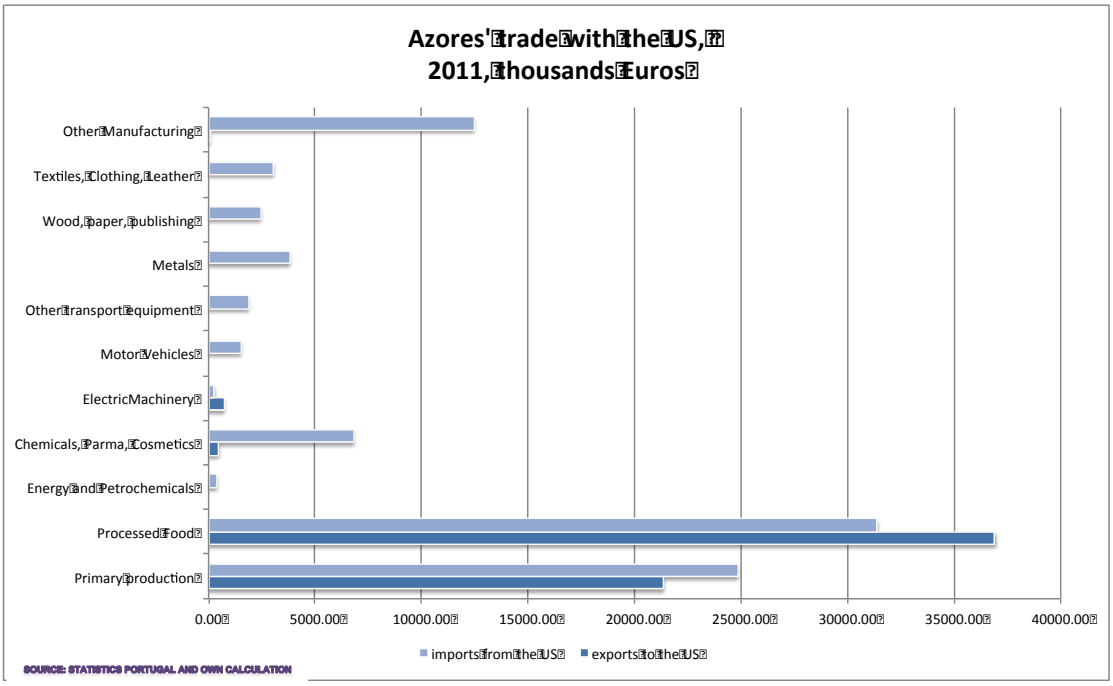
Source: Own calculations from Gtap9.

1.3 AZORES

In this section, we turn to some descriptive figures and discussion of the Azores economy. Figure 7 depicts bilateral exports and imports in manufacturing sectors with the US.[6] Given the size of the Azores economy, exports take place only in some sectors, with the greatest share of exports being in processed food products, followed by primary production. On the other hand, the Azores has a diversified pattern of imports from the US, although again, processed food and primary production are the most important sectors.

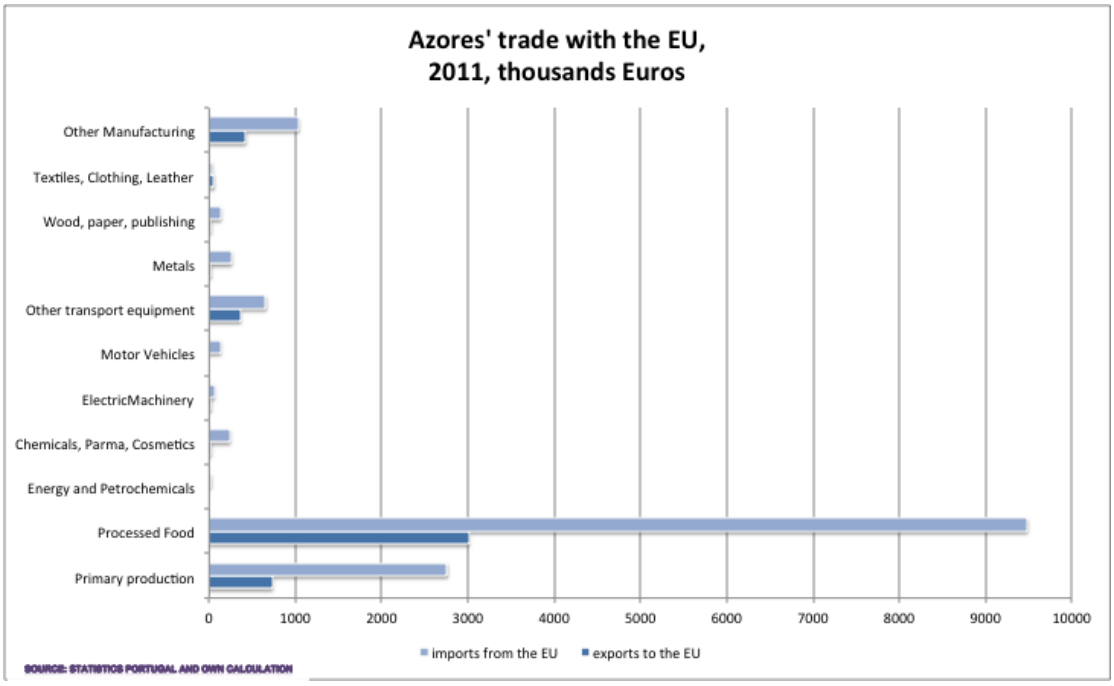
[6] Either the latest available data or if available, data for 2011 are presented as this is the baseline data for the rest of the analysis.

Figure 7 Azores' manufacturing trade with the US



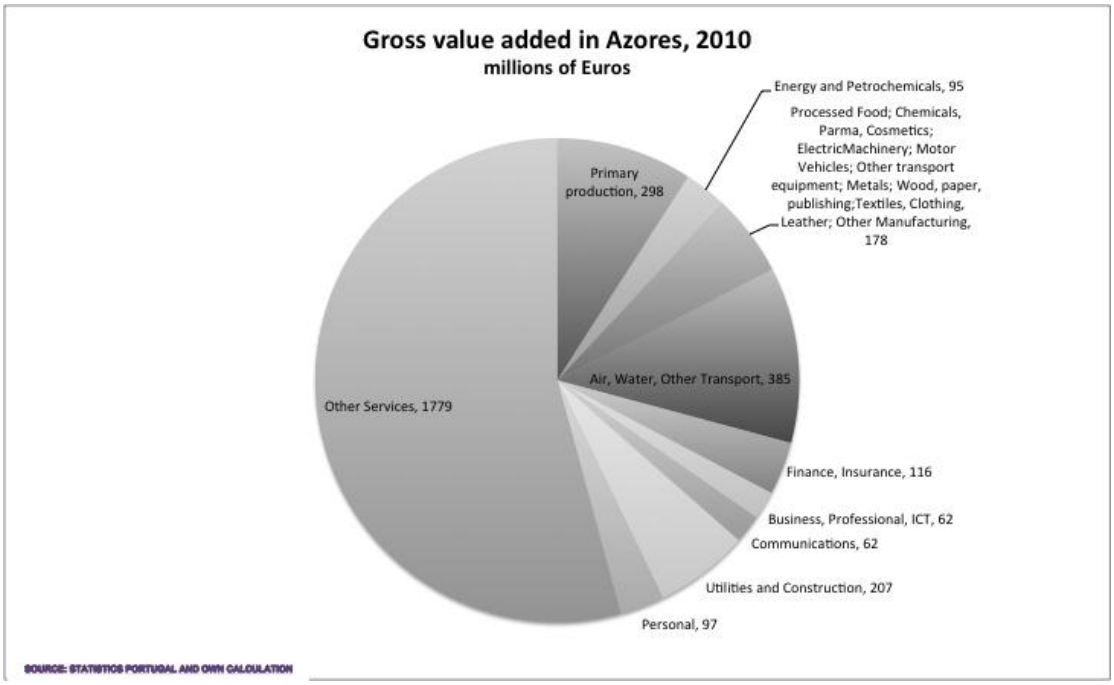
From Figure 8 it is evident that Azores trades more with the US than with the EU. Exports to the EU are a fraction of those to the US in manufacturing products. Manufacturing trade with the EU is also mostly taking place in food and primary production.

Figure 8 Azores' manufacturing trade with the EU



The value added structure of the Azores economy is depicted in Figure 9. Services sectors together provide more than two-thirds of total value added in the Azores. From the manufacturing sectors, similarly to the export structure, it is the primary production sector, which is the most important sector in terms of contribution to value added.

Figure 9 Azores' gross value added by sectors



1.4 NTBS AND NTB REDUCTION: ACTIONABILITY AND RENTS

Recent negotiations on trade agreements have been more focused on the importance of non-tariff barriers (NTBs) in addition to lowering tariffs than in the past. These are now a key component of trade agreements, and are likely to be increasingly important as we move forward. The reasons for this are as follows. First, with the multilateral, bilateral, and unilateral moves to reduce tariffs, what remains is by definition non-tariff barriers, which implies that they are getting more importance in a relative sense. Secondly, political processes that generate tariff protection of specific industries may turn to lobbying for NTBs as the scope for tariff protection is reduced. This would imply NTBS getting more important in an absolute sense. Third, while not contributing to the rising importance of NTBs per se, significant progress in research in this area means we have a better understanding of NTBs. This has contributed to a heightened

awareness of barriers to trade.[7] Finally, with a global shift to the "global factory" with firms sourcing and producing in multiple countries, differences in regulation across countries are important sources of costs for firms, where this may not have been the case for the same set of regulations 25 years ago.

It should be stressed that in contrast to reducing tariffs, the removal of NTBs is not as straightforward. In fact, it is unlikely that all areas of regulatory divergence identified by the policy research community actually can be addressed. As previously pointed out, there are many different sources of NTBs and thus removing them may require constitutional changes, unrealistic legislative changes, or unrealistic technical changes. Removing NTBs may also be difficult politically, e.g. because there is a lack of sufficient economic benefit to support the effort; because the set of regulations is too broad; because of consumer preferences, language and geography; or due to other political sensitivities. In recognition of these difficulties, in the assumptions of the scenarios, the degree to which an NTB or regulatory divergence can, potentially and realistically, be reduced is taken into account in the modelling scenarios here, as discussed in more details in the following subchapter.

The literature estimating NTBs can be divided into two broad groups. The first involves overviews and assessments of available NTB measures and surveys of existing literature. This includes the OECD (2000) study on technical standards and conformity, OECD (2001) study on sanitary, phytosanitary and technical barriers to trade, the OECD (2005) study on customs fees and charges on imports, the OECD (2006) study on the review of different methods for assessing NTBs and the OECD (2009) study on NTBs affecting trade in agricultural and processed food products.

A second strand of this literature focuses on econometric estimates of non-tariff barriers. In this study we incorporate the econometric and survey results from recent EU-sponsored research on NTBs, building on the EU-US assessment by ECORYS (2009) and CEPR (2013) and the G20 assessment by the OECD (2011). This relies on gravity-based econometrics, integrated with expert and firm

[7] For a survey on previous studies on NTBs in goods, see Anderson and van Wincoop, 2004. For services, see Francois and Hoekman, 2010.

surveys. The finished product of the EC-sponsored business and expert surveys generated bilateral NTB index numbers (between 0 and 100). Final NTB estimates are based on both gravity estimates and survey responses[8].

Table 1-1 presents the resulting estimates of total NTB barriers between the EU/Portugal and the US based on ECORYS (2009). The estimated ad-valorem NTBs between the two regions are quite high, being between 22-25% for goods and around 9% for services. A question, which is highly relevant, is to what extent these barriers could be removed.

To answer this question, the estimates of ECORYS (2009) reflect the feasibility of actually reducing apparent barriers. This reflects the concept of "actionability." The rationale behind the actionability approach is two-fold. First, most NTBs are based on domestic regulations that address certain market failures. In essence this implies that NTBs are put in place to assure that imported products comply with the same standards and regulations as domestic products. Trade costs, and trade frictions, thus arise from differences in regulations and their implementation. Obviously, 'reduction to zero' is not a feasible option for those NTBs, implying that a certain amount of trade costs related to those measures will always exist. Whatever the overall barriers to trade (and to FDI), not all of these can be addressed by negotiations. Some barriers actually follow from valid consumer protection measures for example, while historical and cultural factors may lead to legal and regulatory differences that are not easily changed. In other words, once NTBs are identified, we can subdivide these into those where negotiated reductions are feasible, and those where this is not feasible. The second is costs vs. rents. The result of the ECORYS (2009) breakdown along these lines is reported in Figure 10 and Figure 11 separately for goods and services. From the figures, on average roughly half of identified NTBs are actionable, or can actually be reduced through a process of bilateral negotiations.

[8] These index number were transformed into "levels of trade restrictions", which in turn were used as inputs for gravity regressions. The coefficients emerging from the gravity equation estimates were then used to infer Trade cost equivalents (in ad valorem equivalent terms) resulting from current levels of NTBs (incorporating the Anderson, Bergstrand, Egger and Francois (2008) methodology). These were crosschecked against the OECD restrictiveness indicators and the Product Market Regulation (PMR) indexes (for goods) and the OECD (2007) FDI restrictiveness index (for services).

Table 1-1 Estimates of Total NTB Barriers

	NTB levels: US exports to the EU	NTB levels: EU exports to the US
Primary production	56.8	73.3
Food and beverages	56.8	73.3
Chemicals	13.6	19.1
Electrical machinery	12.8	14.7
Motor vehicles	25.5	26.8
Other transport equipment	18.8	19.1
Metals and metal products	6.0	8.5
Wood and paper products	11.3	7.7
Textiles, clothing, footwear	19.2	16.70
Other manufactures	11.3	7.7
Air transport	2.0	2.0
Water transport	8.0	8.0
Other transport	8.0	8.0
Finance	11.3	31.7
Insurance	10.8	19.1
Business and ICT	14.9	3.9
Communications	11.7	1.7
Construction	4.6	2.5
Personal, cultural, other services	4.4	2.5
Other services	4.4	2.5

Source: ECORYS (2009) and own calculations

The second breakdown in Figure 10 and Figure 11 is the share of total trade costs that actually raise costs, rather than generating rents. The welfare impact of NTBs can be quite different from those that follow from tariffs. First, tariffs are collected as revenue, and do not involve substantial increases in actual cost of production and delivery. With NTBs, these can instead reflect real increases in cost of production and delivery. For example, in the ECORYS (2009) and Copenhagen Economics (2009) studies, on average around 55 % to 60 % of the price impact of NTBs was linked to increased operational costs of firms serving foreign markets. The remainder was linked to higher price because of rents generated by restricted competition in the affected markets. In terms of welfare calculus, this means that a substantial portion of the price effect of NTBs

(roughly half) is pure dead weight loss linked to higher costs. This in turn implies potentially large welfare effects relative to a comparable tariff barrier.[9]

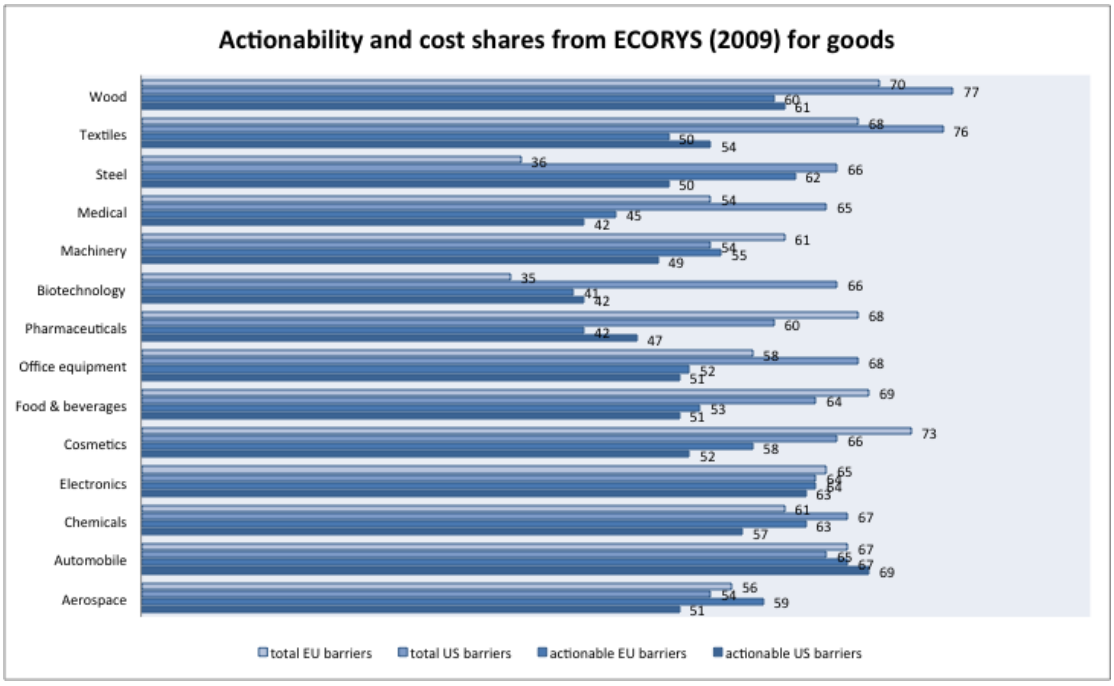
In general, cost-raising trade barriers imply direct, and significant, gains from trade liberalization relative to comparable tariffs (where comparable is defined in terms of price impacts.) Their allocation depends, like terms of trade effects, on relative supply and demand elasticities. Regardless of their national allocation, however, global welfare effects will be bigger. For the purpose of this study, we have focused on a partial reduction of NTBs (50%) and have modelled them as involving trade costs.

Box: NTBs and the concepts of cost and rents

NTBs and regulatory differences can have two main effects. NTBs can either increase the cost of doing business for firms, or they can restrict market access. Traditional NTBs, like import quotas, are an example where NTBs restrict market access. In contrast, regulations that require expensive reconfiguration of products (like changing voltage or reconfiguration of an exhaust system) for export are an example of cost raising NTBs. Both can have different impacts by changing market concentration and economic power (and thus profits) of companies. In order to be able to make a distinction between those two types of NTBs, the concepts of 'cost' and 'rent' are included here in modelling of NTBs, following the findings of the firm surveys (and related literature) in the Ecorys (2009) study. That study found that about 60 % of the price impact of NTBs could be classified as following from actual cost increases on average, while the creation of market power (economic rent) was responsible for the other 40 % of price increases. This is an average, and there is some variation across both sectors and countries in this regard. In the case of NTB-related cost increases, this constitutes a welfare loss to society. In case of an increase in market concentration, consumer prices may also go up. However part of the increase is then appropriated by companies as they reap increased revenues and profits. Thus there is a redistribution of welfare, and not simply a reduction in economic efficiency.

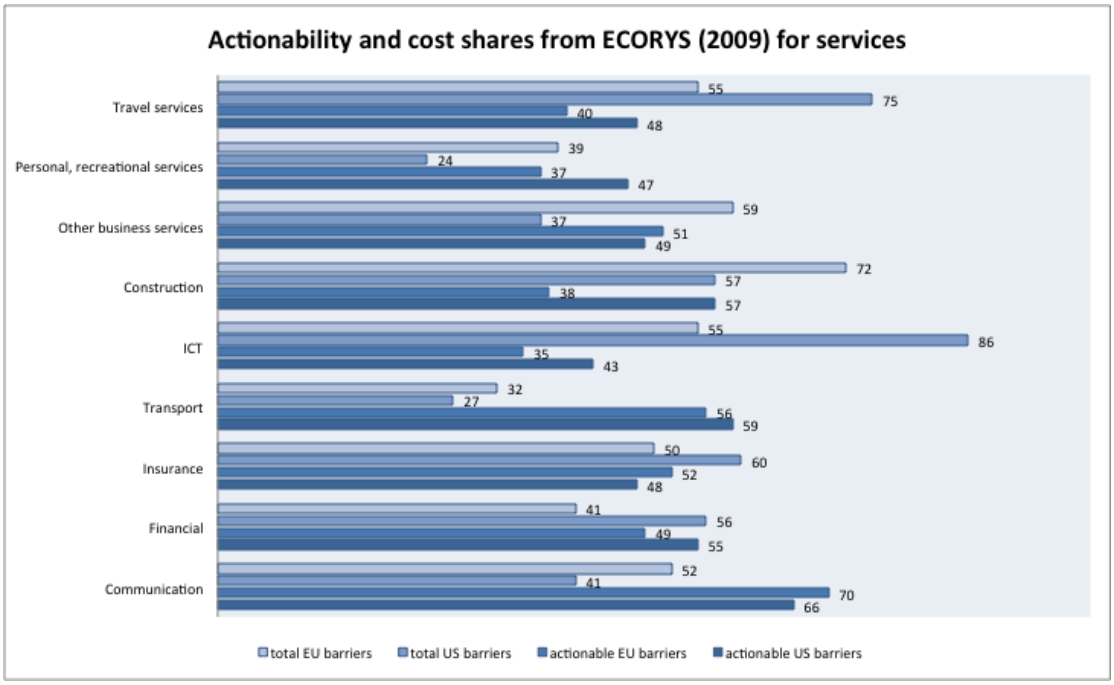
[9] Winchester (2009) reaches a similar conclusion about NTBs vs. tariffs for a single country case. Also see Francois and Wignarajan (2008) and Kitwiwattanachai et al (2010) on the case of Asian regional integration.

Figure 10 Actionability and cost shares for goods and services



Source: ECORYS (2009)

Figure 11 Actionability and cost shares for services



Source: ECORYS (2009)

2 The Model and the Set-up of the Experiments

The following sub-chapter provides a short presentation of the computable general equilibrium model (CGE) applied in the analysis, while more details are available in the Annex. Later in this chapter, we present the specifics, i.e. the data, the baselines and experiments employed in the analysis.

In order to make an economic assessment of the potential impact of the FTA between the EU and the US on Portugal, we employ a CGE model of global world trade. CGE models help answering *what-if* questions by simulating the price, income and substitution effects in equilibrium on markets under different assumptions. Given the general equilibrium nature of these models, complex interactions are captured in the model.

Here, the economic outcomes of the "baseline" scenario, with no policy effects, are compared to the different scenarios with changes in trade policy. The “baseline” for the model is the equilibrium before the policy change, and the ‘scenario’ is the equilibrium after the policy change. The effect of the policy change can then be quantified as the difference between the two.

In this report, detailed results and discussions will be presented for estimated long-run effects. For these long-run results, the "baseline" is taken as the economy projected into 2030. Thus when talking about percentage changes in trade, output etc., those percentage changes will be calculated relative to this "baseline". In addition, the Annex of this report will also provide detailed results of the potential impact over the short-run. For the short-run, the "baseline" compared to which the effects of the policy changes are compared is the economy as of today.[10]

[10] In other words, based on the latest available data, which is benchmarked to 2011.

2.1 THE CGE MODEL

The CGE model employed is based on the widely used GTAP model (Hertel, 1997), with added features from the Francois, van Meijl, and van Tongeren (2005) model. More technical details of the model are provided in the annex.

The most important aspects of the model can be summarised as follows:

- It covers global world trade and production
- It allows for scale economies and imperfect competition
- It includes intermediate linkages between sectors
- It allows for trade to impact on capital stocks through investment effects which allows to obtain longer-run impact on the economy

Box 1. Key features of the model

Model simulations are based on a multi-region global CGE model. Sectors are linked through intermediate input coefficients (based on national social accounts data) as well as competition in primary factor markets. The model includes imperfect competition, short-run and long-run macroeconomic closure options, as well as the standard static, perfect competition, Armington-type of model as a subset. It also allows alternative labour market closures. On the policy side, it offers the option to implement tariff reductions, export tax and subsidy reduction, trade quota expansion, input subsidies, output subsidies, and reductions in trade costs. International trade costs include shipping and logistic services (the source of fob-cif margins) but can also be modelled as Samuelson-type deadweight costs. This can be used to capture higher costs when producing for export markets, due to regulatory barriers or NTBs that do not generate rents (or where the rents are dissipated through rent-seeking).

In the model, there is a single representative composite household in each region, with expenditures allocated over personal consumption and savings. The composite household owns endowments of the factors of production and receives income by selling these factors to firms. It also receives income from tariff revenue and rents accruing from import/export quota licenses. Part of the income is distributed as subsidy payments to some sectors, primarily in agriculture.

Taxes are included at several levels in the modelling. Production taxes are placed on intermediate or primary inputs, or on output. Tariffs are levied at the border. Additional internal taxes are placed on domestic or imported intermediate

inputs, and may be applied at differential rates that discriminate against imports. Where, relevant taxes are also placed on exports and on primary factor income. Finally, where relevant (as indicated by social accounting data) taxes are placed on final consumption, and can be applied differentially to consumption of domestic and imported goods.

On the production side, in all sectors, firms employ domestic production factors (capital, labour and land) and intermediate inputs from domestic and foreign sources to produce outputs in the most cost-efficient way that technology allow. Perfect competition is assumed in all sectors except Chemicals, Electrical machinery, Textiles, clothing, footwear; Other manufactures, and Business and ICT sectors. In sectors where perfect competition is assumed, products from different regions are assumed to be imperfect substitutes.

Heavy manufacturing sectors are modelled with imperfect or monopolistic competition. Monopolistic competition involves scale economies that are internal to each firm, depending on its own production level. An important property of the monopolistic competition model is that increased specialisation at intermediate stages of production yields returns due to specialisation, where the sector as a whole becomes more productive the broader the range of specialised inputs. These gains spill over through two-way trade in specialised intermediate goods. With these 'spill-overs', trade liberalisation can lead to global scale effects related to specialisation. Similar gains follow from consumer good specialisation.

In the standard GTAP model, tariffs and tariff revenues are explicit in the GTAP database, and therefore in the core model. However, NTBs affecting goods and services trade, as well as cost savings linked to trade facilitation, are not explicit in the database and hence a technical coefficient must be introduced to capture these effects. For this, we instead model NTBs as a mix of dead weight or iceberg costs[11], and rents generated by NTBs. In formal terms, dead-weights costs

[11] We will follow the standard approach to modelling iceberg or dead-weight trade costs in the GTAP framework, originally developed by Francois (1999, 2001) with support from the EC to study the Millennium Round (now known as the Doha Round). This approach has grown from an extension in early applications to a now standard feature of the GTAP model, following Hertel, Walmsley and Itakura (2001). It has featured in the joint EC-Canadian government study on an EU-Canada FTA, as well as the 2009 Ecorys study on EU-US non-tariff barriers.

capture the impact of non-tariff measures on the price of imports from a particular exporter due to destination-specific changes in costs for production and delivery.

The model incorporates GTAP v8 data. The GTAP data are benchmarked to the year 2011, but this is projected to the base year 2030. Tariffs reflect the most recent applied rates, as discussed above.

While the GTAP database has 57 sectors and 130 different regions are available, for the purpose of this study we have aggregated sectors and regions to allow us to concentrate on the key results. The sector and regional aggregations for modeling are presented in Table 2-1 below.

Table 2-1: Sectors and Regions used in the Model.

Sectors	Regions
Goods	European Union
Primary production	United States
Food and beverages	Portugal
Chemicals	Spain
Electrical machinery	Oceania
Motor vehicles	East Asia
Other transport equipment	South Asia
Metals and metal products	South East Asia
Wood and paper products	North America
Textiles, clothing, footwear	Latin America
Other manufactures	MENA
Services	Sub-Saharan Africa
air transport	Rest of the World
water transport	
other transport	
Finance	
Insurance	
Business and ICT	
Communications	
Construction	
Personal, cultural, other services	
Other services	

Table 2-2 below summarises other important data used in the modelling. Here, we present the current applied tariff rates, current NTBs and their actionability rates. Data on the levels of NTBs and their actionability rates in place are not

readily available, nor are there any absolute measures on how much of them could or should be removed. The aim of the Ecorys (2009) study was to both quantify the ad-valorem NTBs and to quantify to what extent those are removable between the EU/Portugal and US. Those measures are incorporated in this study, and summarised in the first four columns of Table 2-2.

Table 2-2: Underlying applied tariff rates, NTBS and actionability rates

	NTBs		ACTIONABILITY rates		Tariffs	
	NTB levels: US exports to Portugal/EU	NTB levels: Portuguese/ EU exports to the US	EU/ Portuguese barriers	US barriers	US tariffs on Portuguese exports	Portugal/ EU tariffs on US exports
Primary production	*	*	*	*	0.7	4.4
Food and beverages	56.8	73.3	0.7	0.6	2.4	11.2
Chemicals	13.6	19.1	0.6	0.7	2.0	2.2
Electrical machinery	12.8	14.7	0.6	0.7	0.7	0.5
Motor vehicles	25.5	26.8	0.7	0.7	1.2	8.0
Other transport equipment	18.8	19.1	0.6	0.5	0.2	1.2
Metals and metal products	6.0	8.5	0.4	0.7	1.4	1.8
Wood and paper products	11.3	7.7	0.7	0.8	0.0	0.2
Textiles, clothing, footwear	19.2	16.7	0.5	0.5	8.9	6.5
Other manufactures	*	*	0.7	0.8	0.1	1.3
air transport	2.0	2.0	0.3	0.3	0	0
water transport	8.0	8.0	0.3	0.3	0	0
other transport	8.0	8.0	0.3	0.3	0	0
Finance	11.3	31.7	0.4	0.6	0	0
Insurance	10.8	19.1	0.5	0.6	0	0
Business and ICT	14.9	3.9	0.6	0.6	0	0
Communications	11.7	1.7	0.5	0.4	0	0
Construction	4.6	2.5	0.7	0.6	0	0
Personal, cultural, other services	4.4	2.5	0.4	0.2	0	0
Other services	*	*	*	*	0	0

Source: Ecorys (2009), GTAP9 and own calculations.

The EU/Portuguese tariff rates tend to be higher for several sectors than the US's. This is especially the case for food and beverages, where tariff rates are 11.4 %, and motor vehicles.

The ECORYS (2009) estimates of actionable NTBS -as percentage trade costs- are higher than MFN tariff rates. Some sectors have higher NTBs in the EU than in the US, and vice versa. Two sectors in particular exhibit the highest levels of NTBs for both economies: food and beverages, and motor vehicles (17 and 21 %).

2.2 SCENARIOS

We next turn to the discussion of the scenarios assumed for the CGE model applied in the analysis. The experiments are set up around a baseline and stylised modelling scenarios. The purpose of the baseline is to examine the potential impact of the FTA relative to the expected position of the economy if the policy was not implemented.

Contrasting to the idea of removing tariffs, it is not realistic to assume that all NTBs can be removed due to the underlying differences in the nature of these measures. As a result, when modelling the liberalisation of NTBs, we take into account the degree to which explicit NTBs or trade costs from regulatory divergence can realistically be reduced (via various means and techniques). Following ECORYS (2009), approximately 50 % of all NTBs indeed are removable/actionable. The approximation is based on expert opinions, crosschecks with regulators, legislators and businesses supported by the business survey from the Ecorys (2009) study. Nevertheless, this estimate should be seen as a somewhat rough estimate and thus should be interpreted with some caution.

The estimates reported below are set up around two basic scenarios, differing with respect to the levels of ambition with regards to liberalisation: an ambitious scenario; and a modest scenario. These scenarios are then modified to allow for greater liberalisation of NTBs in certain sectors. The underlying assumptions in the modelling scenarios are summarised in Table 2-3 below.

For full implementation, we work with a projected baseline, focusing on the year 2030. Thus experiments involve comparison to 2030 values along a baseline

macroeconomic projection.[12] The projection of GDP and population also includes a number of agreed FTAs (EU-Korea, Central America, and MERCOSUR, and US-Korea, US-Central America). These results look at the long-run impact of the agreement, where capital is assumed to be fully mobile over sectors and regions. Labour markets are also closer to normal (i.e. operating closer to long-run pre-recession unemployment and participation rates), so that changes in labour demand primarily mean changes in wages rather than changes in employment. (This is discussed more in the technical appendix). Policy changes in general, and the lowering of NTBs in particular, will take time to implement and take effect. Thus we also discuss the more immediate employment implications of initial implementation of a staged agreement, given that the Portuguese economy is still recovering from the recent recession and labour markets are relatively soft.

Table 2-3 Summary of the scenarios

Full Implementation (long-run effects): • Focuses on year 2030, with full effects of implementation • Includes longer run investment changes and reallocation of capital across sectors. • Labour markets in Portugal have further recovered from the impact of recession.	Long-run effects of an agreement that has been fully implemented.
Modest Scenario	98 % of tariffs eliminated, 10 % of NTBs (20 % of actionable NTBs) are eliminated
Ambitious Scenario	100 % of tariffs and 25 % of NTBs (50 % of actionable NTBs) are eliminated
Initial Stages of Implementation (short-run effects): • Excludes longer run investment changes and reallocation of capital across sectors. • Labour markets in Portugal reflect current conditions with high unemployment (soft labour markets)	Assuming that the modest scenario represents the first stages of an ambitious agreement -- 98 % of tariffs eliminated, 10 % of NTBs (20 % of actionable NTBS) are eliminated

Note: Following CEPR (2013) we assume 20% and 50% reductions in actionable NTBs. This translates into roughly 10% and 25% of all NTBs, with some variation across sectors. See CEPR (2013) for further discussion.

Our scenarios range from a relatively shallow agreement on tariffs, combined with modest NTB liberalization at one extreme, to a deep agreement covering

[12] We also assume skill upgrading in the Portuguese labour force through 2030. This is done by assuming that structural changes in skills tracks the projected income changes using UN middle of the range population projections.

tariffs and ambitious NTB reductions. These scenarios do not mean that we believe one of these is particularly likely or even preferred. Rather they serve to frame the questions covered in the report.

Modest scenario (Tariffs and modest NTB liberalization): Under this scenario, we assume that 20 % of trade costs from actionable NTBs (those that can be reduced) actually are eliminated. We also assume that with modest NTB cost reductions, these are discriminatory. Hence US liberalization would only benefit EU firms, and vice-versa.

Ambitious scenario (*Tariffs and ambitious NTB liberalization*): Under this scenario, we assume that 50 % of costs from actionable NTBs (those that can be reduced) are eliminated. We also assume that not all of these NTB cost reductions are discriminatory. This reflects what are called "regulatory spillovers." Basically, with a deep agreement on NTBs, we assume that third countries will also benefit, but to a more limited extent, in terms of some improvement in market access. The logic is that, with deep regulatory reform, at least some of the changes are likely to affect all players, and not just the EU and US firms. For example, where the US recognizes EU standards, firms in other countries might then find it easier to then meet US standards themselves if they already meet EU standards.

3 Changes in the economy as a result of T-TIP

3.1 CGE RESULTS

This section presents results using general equilibrium modelling, first providing results at an aggregate and then also at sectoral level. The results discussed in this section follow the scenarios as defined in **Table 2-3**. Although we briefly discuss results for the short-run, the discussion is focusing on the long-run effects. The results represent estimates of changes in the Portuguese economy compared to the projection baseline. When discussing the long-run effects, we also assume that the agreement is fully implemented, and investment levels and capital stocks have had time to adjust to the new policy environment. This means not only that capital has been reallocated across sectors (sector level capital stocks) but also that total capital stocks have adjusted as well. We also assume in these results that some structural unemployment is present in the economy.

Results assuming that the agreement takes place immediately, thus providing results for the immediate consequences over the short-run, together with long-run results with full employment are presented in the Annex.

3.1.1 MACRO-ECONOMIC EFFECTS

Initial Stages of Implementation (short-run effects)

In this section we briefly discuss the macro effects of an immediate implementation of the T-TIP. Here we assume that labour markets in Portugal reflect current conditions with relatively high unemployment and we also assume the modest liberalisation scenario given that realistically a more ambitious scenario would require longer time frame to implement (results with the ambitious scenario, and sectoral results are presented in the Annex).

Table 3-1 presents the resulting percentage changes in the Portuguese economy. A total of 0.66% increase in GDP is estimated to take place if the agreement is implemented immediately. The most impact comes from NTB reductions on

goods and tariff reductions. In total, that would translate into a 1164 million euros increase in National Income. Aggregate exports and imports are estimated to increase by around 1-1.3 %, with exports increasing slightly more leading to a small terms of trade improvement. Wages in all skill categories are estimated to decrease, although just marginally, by 0.08%.

Table 3-1 Summary of macroeconomic effects, initial stages of implementation

	Modest scenario			
	Tariffs	NTBs Goods	NTBs Services	**Total**
GDP, %	0.31	0.34	0.01	**0.66**
National Income, million euros	564.44	592.39	7.67	**1164.48**
Consumer Prices, %	0.03	0.06	0.00	**0.08**
Exports, %	0.67	0.60	0.03	**1.30**
Imports, %	0.54	0.45	0.02	**1.02**
Terms of Trade, %	0.02	0.00	0.00	**0.03**
low skill wages, %	-0.03	-0.06	0.00	**-0.08**
medium skill wages, %	-0.03	-0.06	0.00	**-0.08**
high skill wages, %	-0.03	-0.06	0.00	**-0.08**

Source: CGE model estimates

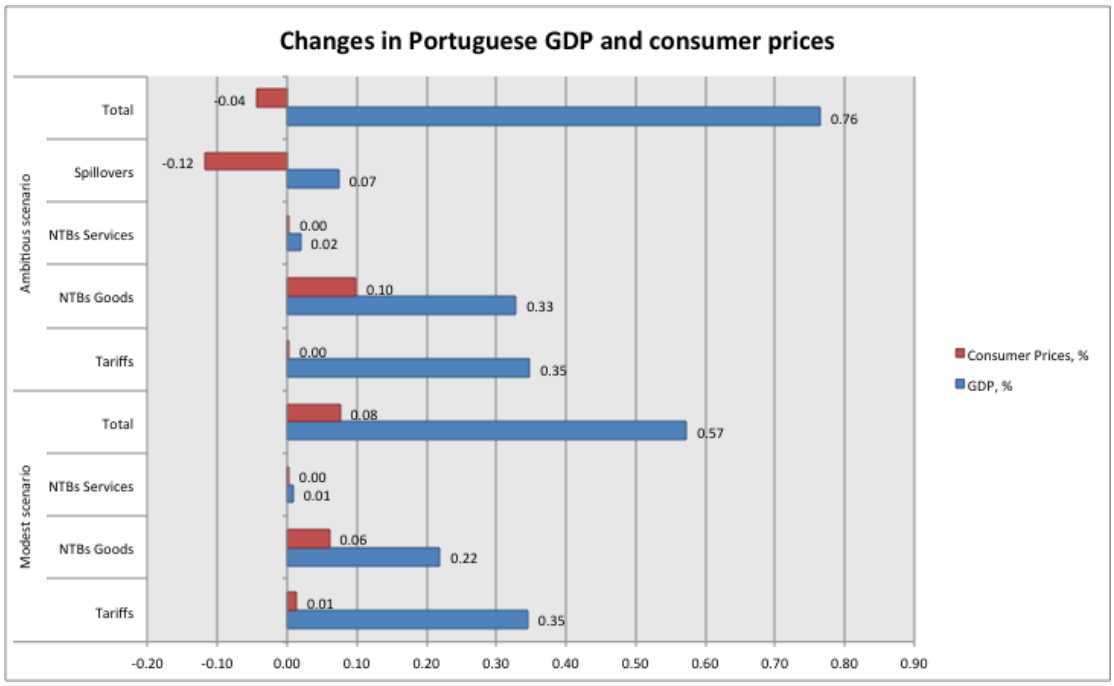
Full Implementation (long-run effects):

Figure 12 through Figure 14 below presents a summary of the macroeconomic impact of T-TIP on the Portuguese economy. The first figure shows percentage changes in consumer prices and GDP. While consumer prices would only marginally change overall, GDP would increase by 0.76% under the ambitious scenario, and by 0.57% under the modest scenario. Under both scenarios the main contribution to this gain comes from tariff liberalisation, followed by removal of NTBs in goods. Liberalisation in services does not have a significant impact on the Portuguese economy at the aggregate level. This is due to the underlying specialisation, production and trade structure of the Portuguese economy, with exports being concentrated more in sectors that would benefit from elimination of high US import tariffs.

It is likely that under the final agreement, tariffs will be eliminated first, while NTB reduction will be more gradual. These results indicate that tariff elimination is far more important for Portugal than it is for the EU as a whole. Because of

this, Portugal is likely to benefit proportionately more from tariff reductions than the EU as a whole, and Portugal is likely to benefit much earlier, and to a greater extent, from the first stages of T-TIP implementation.

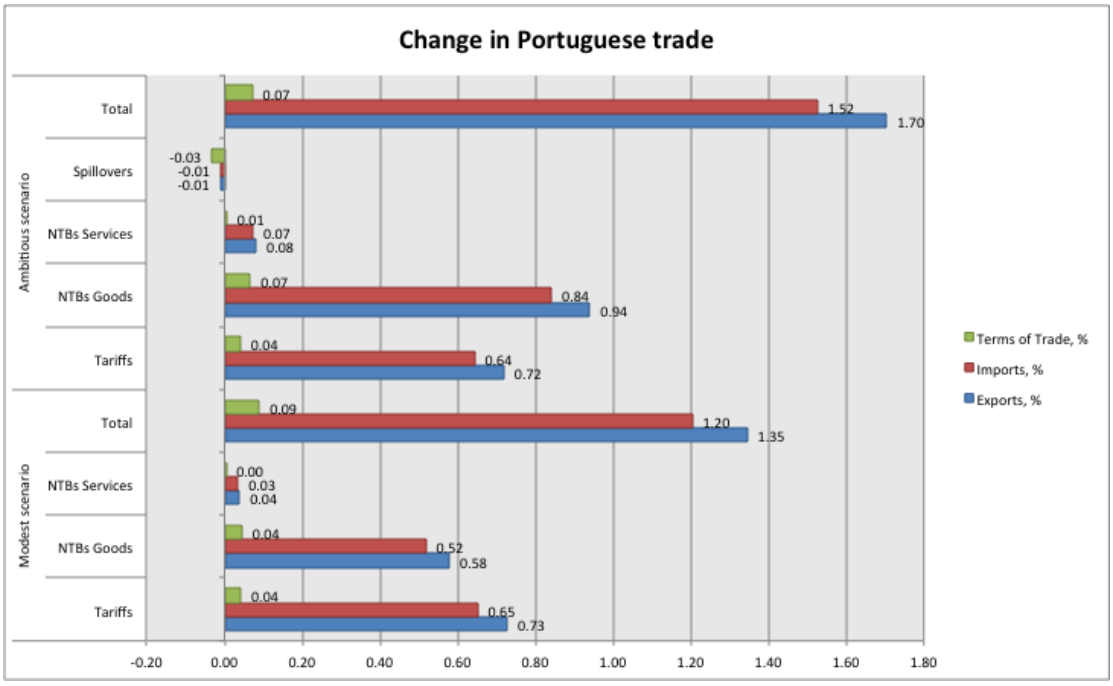
Figure 12 Changes in Portuguese GDP and consumer prices



Source: CGE model estimates

Figure 13 depicts changes in the Portuguese terms of trade and total exports and imports. By terms of trade we mean the change in the price of exports relative to the price of imports. Under both the modest and ambitious scenarios, trade will increase as a result of tariff and non-tariff barrier reductions. Both exports and imports would increase between 1.2% and 1.7%. The increase in exports would be somewhat larger than the increase in imports being accompanied with overall slight terms of trade improvement. Under the modest scenario, which assumes lower NTB reductions, it is tariffs that contribute more to these changes. However, as NTBs are assumed to be reduced more radically under the ambitious scenario, NTB reductions in goods account for a somewhat larger trade increase.

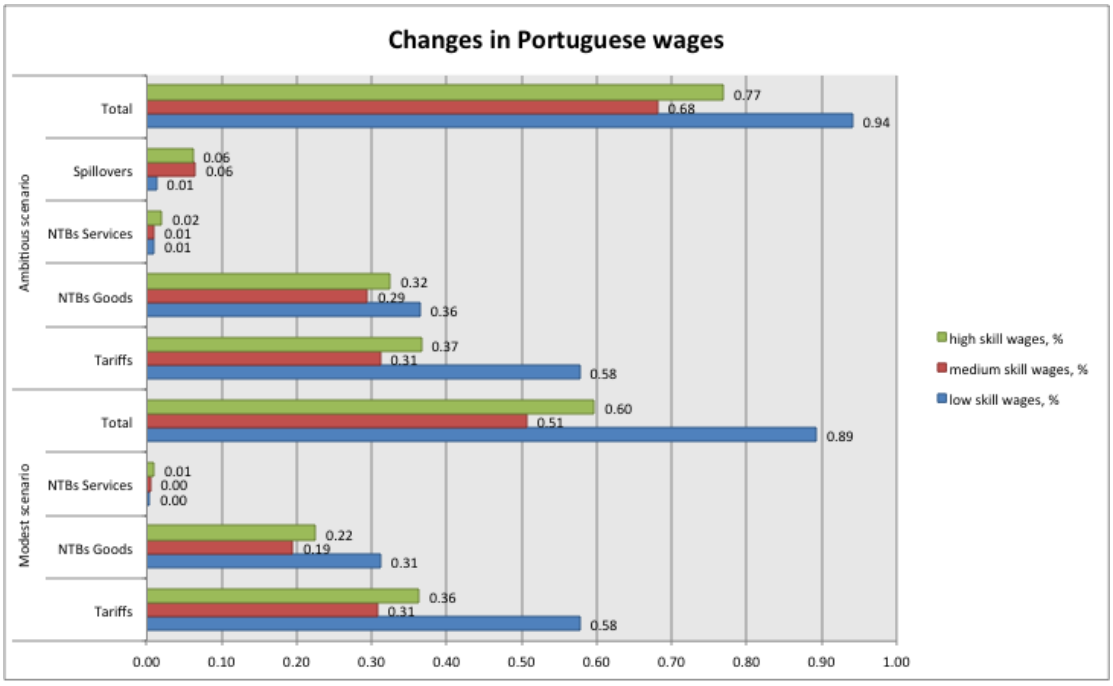
Figure 13 Changes in Portuguese trade



Source: CGE model estimates

Workers in all skill sets are projected to experience a wage increase under both the ambitious and modest scenarios with the increase being slightly higher for the ambitious scenario (see Figure 14). Wages of lower skilled workers would increase the most, between 0.89-0.94%. This is due to lower skilled workers being employed more in sectors that experienced a relatively higher increase in wages, most importantly in textiles and apparel sector.

Figure 14 Changes in Portuguese wages



Source: CGE model estimates

As trade in Portugal, and in the whole EU, increases with trade barrier reductions, traffic in Portuguese ports is also expected to increase. Port traffic is estimated to increase by 1-1.8% due to removal of trade barriers to about 88-89 million tonnes of traffic over the long-run.[13]

Table 3-2 Changes in port traffic

	Modest scenario	Ambitious scenario
In million tonnes	88.1	88.8
% Change	1.0%	1.8%

Source: CGE model estimates

The summary of the macroeconomic effects is provided in Table 3-3 below. As was discussed above, an important part of the gains comes from reductions in tariffs. This contrasts with the EU as a whole (see CEPR 2013) where tariff reductions had less important impact. The reason is that, in the case of Portugal, exports are more concentrated in sectors that would benefit from elimination of

[13] This % change is calculated compared to the 2030 projected port traffic. Given data restrictions, a simplifying assumption was used to calculate port traffic changes. It was assumed, that the importance Portugal's ports within the EU would remain the same (in other words the share of port Portuguese port traffic in total EU port traffic). This assumption allowed us to use the current share of port traffic in Portugal in total EU port traffic and apply it on future expected total EU port traffic increase.

high US import tariffs. For example, textiles and clothing are 15.5 % of Portuguese goods exports to the US and face an 8.8 % tariff, but this sector only accounts for 2.4 % of goods exports for the EU as a whole. Tariffs are likely to be reduced first (i.e. they will be front loaded) while NTB reductions will take longer. Portugal is expected to benefit relatively more from tariff reductions compared to NTB reductions on services than the EU as a whole given Portugal's trade structure. As a result, Portugal is likely to benefit earlier from the initial stages of T-TIP implementation.

Table 3-3 Summary of macroeconomic effects

	Modest scenario				Ambitious scenario				
	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers	**Total**
GDP, %	0.35	0.22	0.01	**0.57**	0.35	0.33	0.02	0.07	**0.76**
National Income, million euros	775	487	14	**1277**	778	718	32	118	**1610**
Consumer Prices, %	0.01	0.06	0.00	**0.08**	0.00	0.10	0.00	-0.12	**-0.04**
Exports, %	0.73	0.58	0.04	**1.35**	0.72	0.94	0.08	-0.01	**1.70**
Imports, %	0.65	0.52	0.03	**1.20**	0.64	0.84	0.07	-0.01	**1.52**
Terms of Trade, %	0.04	0.04	0.00	**0.09**	0.04	0.07	0.01	-0.03	**0.07**
low skill wages, %	0.58	0.31	0.00	**0.89**	0.58	0.36	0.01	0.01	**0.94**
medium skill wages, %	0.31	0.19	0.00	**0.51**	0.31	0.29	0.01	0.06	**0.68**
high skill wages, %	0.36	0.22	0.01	**0.60**	0.37	0.32	0.02	0.06	**0.77**

Source: CGE model estimates

In Table 3-4 we present estimates of changes in employment. We focus here on the full implementation (long-run effects) of the ambitious scenario for which results are presented in the last two columns of the table. Nevertheless, we also present the estimated employment changes for the initial stages of implementation (short-run effects) based on the modest scenario. These results are presented in the first two columns.[14] This means lower NTB reductions at the outset (corresponding to the short-run modest scenario), but deeper NTB reductions fully implemented by 2030 (corresponding to the long-run ambitious scenario).

We use the year 2011 as a reference year (representative of the current economic situation). In the short-run we have modelled labour markets as soft, meaning if firms demand more labour, they can hire additional workers without

[14] For an overview of the different scenarios see **Table 2-3**.

driving up wages. This reflects the relatively high rates of unemployment that characterize the immediate post-recession macroeconomic environment. However, in the long-run, labour markets are modelled as healthier, with wages going up when firms demand more labour (or down as they demand less).[15] This dampens the potential impact on employment levels, shifting changes in labour market demand more onto wages rather than onto employment levels.

Overall, we estimate that implementation of an ambitious agreement would imply roughly 40.5 thousand more jobs in the initial stages (see Table 3-4) with no change in wages, but with 23.0 thousand more jobs in the longer run, along with an increase in wages of 0.8 % (see Figure 14).

Table 3-4: Employment effects of ambitious agreement, thousand jobs

	Initial Stages of Implementation (short-run effects):		Full Implementation (long-run effects):	
	2011 baseline	change	2030 baseline	change
Primary and food production	622.6	0.2	732.0	-5.8
Manufacturing	673.3	15.3	585.2	23.7
Services	3,284.3	25.0	3,329.1	5.0
Total	4,580.2	40.5	4,646.4	23.0

3.1.2 SECTOR LEVEL RESULTS

In this section we present the potential impact of T-TIP at the sectoral level. While estimated effects are generally in line with macroeconomic effects, there are three sectors with outsized effects – textiles and clothing (relatively large

[15] The short-run outcome is based on the current structure of trade and the economy, using the latest year available from the dataset, which is 2011. Under this short-run scenario, there are structural rigidities in the model. The labour market is characterized by rigid nominal wages. This implies that as tariff liberalization takes place and output changes across sectors, labour used in the different sectors will change, but nominal wages remain unchanged, resulting in changes in overall employment. In addition, over this short-run scenario, capital mobility is also limited. In technical terms, following the macroeconomic DSGE literature, for the long-run we specify a long-run average, aggregate long-run reduced form labour supply elasticity for Portugal of 0.45.

expansion), electrical machinery (relatively large contraction), and chemicals (relatively large contraction). For this reason, while we cover all sectors in this section, we also place additional emphasis on these three sectors.

Table 3-5 shows sectoral changes in Portuguese output. Output in the textiles and apparel sector is expected to increase by about 18% under both the modest and ambitious scenarios. The main contribution to output expansion in the sector comes from tariff reductions. We also estimate a reduction in output in electrical machinery of between 10 and 12 percent, also driven primarily by tariffs. Output in the chemicals sector is projected to fall by roughly 4 to 6 percent. In other sectors, output changes range between -2.5 percent (metals) and +0.8 percent (construction).

To better understand the pattern of changes in manufacturing, we start with Table 2-2. The textiles and clothing sector exhibits peak industrial tariffs in both the US and the EU. US tariffs against Portuguese exports in this sector are 8.9 percent, roughly 3 x the average industrial tariff. In the case of electrical machinery, tariffs are among the lowest. Yet from Table 3-5 tariff changes under T-TIP are the primary driver of changes in this sector as well. Clearly, therefore, it is changes in tariffs in other sectors that drive the change in this sector, as there is very little to liberalize in the sector itself in terms of tariffs.

In Table 3-6 we provide a breakdown in the reallocation of value added across manufacturing under the ambitious scenario, scaled by economy-wide value added. The textile and clothing sector is substantially larger than either chemicals or electrical machinery as a share of total value added. With the expansion of textiles and clothing, roughly half of the reallocation of value added in textiles and clothing comes from the rest of manufacturing. What we see therefore is that the expansion of the textiles and clothing sector, which benefits from elimination of an 8.9 percent tariff in the US, requires that resources be shifted out of other sectors. This is however only a partial explanation. Another pattern in Table 3-6 is that electrical machinery and chemicals (inclusive of pharmaceuticals) are disproportionately impacted by this reallocation of resources, compared to the rest of manufacturing. Part of the reason for this is shown by the cost share data in Table 3-7. Both electrical machinery and

chemicals are sectors where, compared to the rest of manufacturing, a relatively large share of total costs comes from imported inputs. In electrical machinery, imported inputs are 33 percent of total costs, compared to a cost share of 23 percent in the rest of manufacturing. Chemical is 27 percent. This means that a greater share of production costs in these sectors depends on global rather than local cost conditions. In other words, compared to other manufacturing, electrical machinery is particularly "foot loose," meaning firms will find it easier to relocate elsewhere (for example to the US) because less of their costs depend on local conditions.

Another factor driving the relatively large change in output in electrical machinery is that the overall EU industry shifts to sourcing relatively more from US firms rather than from other member states. Figure 3 above shows that about 70% of Portuguese exports in the electric machinery are destined to EU markets. Thus as the T-TIP allows other EU member states to source from more competitive US producers, demand for electric machinery from Portugal by other Member States falls, contributing further to the contraction of this sector. One final driver it that the electric machinery decrease in Portugal also reflects a general decline in output in this sector across the EU, as identified already in the ECORYS (2009) and CEPR (2013) studies. In the Portuguese context, Portugal's ties to the broader European sector reinforce the reallocation effects identified for the EU. Roughly half of industry output is exported, and 35% of output is destined for the broader European industry. As such the decline for the broader EU industry is transmitted to Portugal in the form of lower exports. This is discussed further below. Of these effects, the primary contributors to the output drop in this sector appear to be the reallocation of resources away from this sector (especially to textiles and clothing) combined with the relatively "foot loose" cost structure of the industry, which allows for a relatively large shift of resources away from this sector.

Changes in employment by skill level and for each sector are presented in Table 3-8 to

Table 3-10. Changes in the demand for labor in the different sector drives the changes in employment. The demand for labor in turn is driven by change in output presented in the table above. Thus the main trends in employment changes, with two sectors, electric machinery and textiles and apparel being the most affected, are similar to those of the output changes. Changes in sectoral exports are broadly in line with changes in output (see Table 3-11).

Exports in textiles and apparel increase by about 30%, as discussed above, mainly due to the sector's importance in Portuguese exports to the US and the underlying tariff liberalization.

Table 3-5 Changes in Portuguese output (in %)

	Modest scenario				Ambitious scenario				
	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers	**Total**
Primary	-0.21	-0.22	0.01	**-0.42**	-0.22	-0.39	0.01	-0.14	**-0.72**
Processed Food	-0.03	0.14	0.01	**0.12**	-0.02	0.34	0.01	-0.03	**0.30**
Energy	0.12	-0.26	0.01	**-0.13**	0.14	-0.33	0.03	0.20	**0.08**
Chemicals	-1.85	-2.24	-0.06	**-4.15**	-1.85	-3.57	-0.11	-0.37	**-6.05**
Electric Machinery	-9.30	-2.65	-0.10	**-12.04**	-8.58	-0.20	-0.23	0.27	**-10.26**
Vehicles	-1.76	0.44	0.01	**-1.32**	-1.91	1.70	0.01	-0.45	**-0.78**
Other Transport Equipment	-1.24	-0.74	0.00	**-1.98**	-1.19	-1.03	0.01	0.08	**-2.14**
Metals	-1.63	-0.93	0.00	**-2.57**	-1.61	-1.06	0.01	0.12	**-2.56**
Wood, Paper, Publishing	-0.55	-0.06	0.01	**-0.60**	-0.51	0.28	0.02	0.10	**-0.08**
Textiles and Apparel	11.88	6.19	-0.01	**18.06**	11.71	6.02	-0.02	-0.01	**17.58**
Other Manufacturing	-1.15	-0.40	0.01	**-1.54**	-1.12	0.01	0.03	0.10	**-0.99**
Air transport	-0.26	-0.15	0.06	**-0.35**	-0.25	-0.04	0.12	0.15	**0.08**
Water transport	0.01	0.03	0.01	**0.04**	0.02	0.15	0.01	0.22	**0.53**
Other Transport	-0.03	0.01	0.07	**0.04**	-0.03	0.10	0.13	0.12	**0.36**
Finance	0.27	0.17	0.02	**0.46**	0.28	0.27	0.03	0.05	**0.62**
Insurance	0.19	0.12	0.07	**0.39**	0.20	0.21	0.15	0.06	**0.62**
Business, Professional, ICT	0.13	0.09	0.01	**0.23**	0.14	0.18	0.01	0.05	**0.38**
Communications	0.11	0.10	-0.01	**0.20**	0.12	0.21	-0.01	0.06	**0.38**
Construction	0.33	0.21	0.01	**0.54**	0.34	0.33	0.02	0.08	**0.76**
Personal Services	-0.15	-0.05	-0.06	**-0.26**	-0.14	0.05	-0.13	0.09	**-0.08**
Other Services	0.18	0.14	0.01	**0.33**	0.19	0.23	0.02	0.06	**0.50**

Source: CGE model estimates

Table 3-6 Change in Manufacturing Value Added Shares, Ambitious Scenario
Electrical machinery, textiles and clothing, and all other manufacturing

	value added shares		change in value added shares				
	Old VA share, pct	New VA share, pct	Tariffs	NTBs Goods	NTBs Services	Spillovers	Total change
Share of economy-wide value added, percent							
chemicals	1.90	1.79	-0.04	-0.07	0.00	-0.01	-0.11
electrical machinery	0.50	0.46	-0.04	0.00	0.00	0.00	-0.04
textiles and clothing	3.30	3.88	0.39	0.20	0.00	0.00	0.58
other manufacturing	11.30	11.18	-0.12	-0.01	0.00	0.01	-0.12

Source: GTAP database and CGE scenario estimates.
Note: Table presents shares of total (economy-wide) value added.

Table 3-7 Production Costs: Value Added and Input Shares in Manufacturing

	Value Added	Domestic Inputs	Imported Inputs
chemicals	24.1	48.6	27.4
electrical machinery	25.4	41.2	33.4
textiles and clothing	31.4	47.1	21.5
other manufacturing	33.8	42.9	23.3

Source: GTAP database. Note shares sum to 100.

Table 3-8 Change in low skilled employment by sector (in %)

	Modest scenario				Ambitious scenario				
	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spill-overs	**Total**
Primary	-0.32	-0.30	0.01	**-0.61**	-0.33	-0.49	0.02	-0.16	**-0.96**
Processed Food	-0.40	-0.06	0.00	**-0.45**	-0.39	0.11	0.01	-0.03	**-0.29**
Energy	-0.15	-0.39	0.01	**-0.52**	-0.13	-0.48	0.03	0.19	**-0.33**
Chemicals	-2.14	-2.34	-0.06	**-4.53**	-2.14	-3.64	-0.11	-0.35	**-6.35**
Electric Machinery	-9.29	-2.73	-0.09	**-12.12**	-8.60	-0.39	-0.22	0.26	**-10.40**
Vehicles	-2.09	0.20	0.00	**-1.89**	-2.23	1.39	0.01	-0.42	**-1.37**
Other Transport Equipment	-1.49	-0.87	0.00	**-2.36**	-1.45	-1.15	0.01	0.10	**-2.49**
Metals	-1.90	-1.07	0.00	**-2.97**	-1.87	-1.20	0.00	0.13	**-2.94**
Wood, Paper, Publishing	-0.91	-0.26	0.01	**-1.17**	-0.87	0.05	0.01	0.11	**-0.66**
Textiles and Apparel	11.21	5.85	-0.01	**17.04**	11.05	5.68	-0.02	0.01	**16.61**
Other Manufacturing	-1.43	-0.54	0.01	**-1.96**	-1.40	-0.16	0.03	0.11	**-1.41**
Air transport	-0.60	-0.29	0.07	**-0.83**	-0.59	-0.13	0.13	0.21	**-0.24**
Water transport	-0.62	-0.30	0.00	**-0.92**	-0.61	-0.21	0.01	0.22	**-0.44**
Other Transport	-0.54	-0.25	0.07	**-0.72**	-0.54	-0.15	0.12	0.15	**-0.33**
Finance	-0.23	-0.08	0.01	**-0.30**	-0.22	-0.01	0.03	0.06	**-0.12**
Insurance	-0.15	-0.03	0.08	**-0.11**	-0.14	0.08	0.15	0.10	**0.22**
Business, Professional, ICT	-0.40	-0.18	0.00	**-0.58**	-0.39	-0.13	0.01	0.05	**-0.44**
Communications	-0.39	-0.16	-0.01	**-0.56**	-0.38	-0.07	-0.02	0.07	**-0.37**
Construction	-0.02	0.02	0.01	**0.01**	-0.02	0.13	0.02	0.08	**0.22**
Personal Services	-0.51	-0.23	-0.06	**-0.80**	-0.50	-0.11	-0.13	0.12	**-0.55**
Other Services	-0.21	-0.05	0.01	**-0.25**	-0.20	0.07	0.02	0.10	**0.02**

Source: CGE model estimates

Table 3-9 Change in medium skilled employment by sector (in %)

	Modest scenario				Ambitious scenario				
	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spill-overs	**Total**
Primary	-0.24	-0.26	0.01	**-0.50**	-0.25	-0.47	0.02	-0.18	**-0.88**
Processed Food	-0.13	0.06	0.00	**-0.07**	-0.13	0.18	0.01	-0.08	**-0.03**
Energy	0.01	-0.32	0.01	**-0.30**	0.02	-0.44	0.03	0.16	**-0.18**
Chemicals	-1.85	-2.22	-0.06	**-4.13**	-1.86	-3.57	-0.11	-0.41	**-6.08**
Electric Machinery	-9.03	-2.62	-0.09	**-11.74**	-8.33	-0.32	-0.23	0.21	**-10.14**
Vehicles	-1.80	0.33	0.00	**-1.47**	-1.94	1.46	0.01	-0.48	**-1.09**
Other Transport Equipment	-1.20	-0.74	0.00	**-1.94**	-1.16	-1.08	0.01	0.04	**-2.21**
Metals	-1.61	-0.94	0.00	**-2.56**	-1.59	-1.13	0.00	0.07	**-2.66**
Wood, Paper, Publishing	-0.62	-0.13	0.01	**-0.74**	-0.58	0.13	0.01	0.05	**-0.37**
Textiles and Apparel	11.55	6.00	-0.01	**17.54**	11.38	5.77	-0.02	-0.06	**16.94**
Other Manufacturing	-1.14	-0.42	0.01	**-1.54**	-1.11	-0.09	0.03	0.05	**-1.13**
Air transport	-0.22	-0.13	0.06	**-0.28**	-0.21	-0.03	0.13	0.14	**0.13**
Water transport	-0.24	-0.13	0.00	**-0.37**	-0.23	-0.11	0.01	0.14	**-0.07**
Other Transport	-0.16	-0.08	0.07	**-0.17**	-0.16	-0.05	0.12	0.07	**0.03**
Finance	0.07	0.04	0.01	**0.13**	0.07	0.07	0.03	0.00	**0.16**
Insurance	0.15	0.10	0.07	**0.32**	0.15	0.16	0.15	0.04	**0.51**
Business, Professional, ICT	-0.10	-0.06	0.00	**-0.16**	-0.10	-0.06	0.01	-0.01	**-0.16**
Communications	-0.10	-0.03	-0.01	**-0.14**	-0.09	0.00	-0.02	0.01	**-0.09**
Construction	0.31	0.16	0.01	**0.48**	0.31	0.21	0.02	0.01	**0.54**
Personal Services	-0.22	-0.10	-0.06	**-0.38**	-0.21	-0.04	-0.13	0.07	**-0.27**
Other Services	0.12	0.09	0.01	**0.22**	0.12	0.15	0.02	0.04	**0.33**

Source: CGE model estimates

Table 3-10 Change in high skilled employment by sector (in %)

	Modest scenario				Ambitious scenario				
	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spill-overs	**Total**
Primary	-0.26	-0.27	0.01	**-0.53**	-0.27	-0.48	0.01	-0.17	**-0.91**
Processed Food	-0.19	0.02	0.00	**-0.17**	-0.19	0.14	0.00	-0.08	**-0.13**
Energy	-0.03	-0.34	0.01	**-0.36**	-0.01	-0.46	0.02	0.16	**-0.24**
Chemicals	-1.91	-2.25	-0.06	**-4.23**	-1.92	-3.60	-0.12	-0.41	**-6.18**
Electric Machinery	-9.09	-2.65	-0.10	**-11.84**	-8.39	-0.36	-0.24	0.21	**-10.24**
Vehicles	-1.87	0.29	0.00	**-1.57**	-2.00	1.42	0.00	-0.48	**-1.20**
Other Transport Equipment	-1.26	-0.78	0.00	**-2.04**	-1.22	-1.11	0.00	0.04	**-2.31**
Metals	-1.67	-0.98	-0.01	**-2.66**	-1.65	-1.16	-0.01	0.07	**-2.76**
Wood, Paper, Publishing	-0.68	-0.17	0.00	**-0.85**	-0.65	0.09	0.00	0.05	**-0.48**
Textiles and Apparel	11.48	5.96	-0.02	**17.42**	11.31	5.73	-0.04	-0.05	**16.82**
Other Manufacturing	-1.20	-0.45	0.00	**-1.65**	-1.17	-0.13	0.01	0.06	**-1.24**
Air transport	-0.30	-0.17	0.06	**-0.42**	-0.29	-0.08	0.12	0.14	**-0.01**
Water transport	-0.32	-0.18	0.00	**-0.51**	-0.31	-0.16	-0.01	0.15	**-0.21**
Other Transport	-0.24	-0.12	0.06	**-0.30**	-0.24	-0.10	0.11	0.08	**-0.10**
Finance	0.00	0.01	0.01	**0.02**	0.01	0.03	0.02	0.01	**0.06**
Insurance	0.08	0.06	0.07	**0.21**	0.09	0.12	0.14	0.05	**0.40**
Business, Professional, ICT	-0.17	-0.09	0.00	**-0.26**	-0.17	-0.10	0.00	0.00	**-0.26**
Communications	-0.16	-0.07	-0.01	**-0.24**	-0.15	-0.03	-0.03	0.01	**-0.20**
Construction	0.23	0.13	0.00	**0.36**	0.24	0.17	0.01	0.02	**0.42**
Personal Services	-0.28	-0.14	-0.07	**-0.49**	-0.27	-0.07	-0.14	0.07	**-0.37**
Other Services	0.05	0.05	0.00	**0.10**	0.05	0.11	0.01	0.04	**0.22**

Source: CGE model estimates

Table 3-11 Change in exports by sector (in %)

	Modest scenario				Ambitious scenario				
	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers	**Total**
Primary	-0.74	0.27	0.00	**-0.47**	-0.71	1.24	0.01	0.08	**0.74**
Processed Food	-0.09	0.44	0.01	**0.36**	-0.06	1.13	0.02	0.12	**1.25**
Energy	4.60	-0.51	0.00	**4.09**	4.67	-0.64	0.01	0.49	**4.63**
Chemicals	-2.78	-3.25	-0.07	**-6.10**	-2.74	-5.03	-0.13	-0.43	**-8.51**
Electric Machinery	-11.12	-3.56	-0.12	**-14.81**	-10.26	-0.93	-0.29	0.45	**-12.74**
Vehicles	-2.01	0.85	0.01	**-1.16**	-2.17	2.74	0.01	-0.41	**0.01**
Other Transport Equipment	-1.37	-0.12	0.01	**-1.48**	-1.33	0.48	0.02	0.21	**-0.56**
Metals	-1.96	-1.21	0.00	**-3.17**	-1.92	-1.49	0.01	0.38	**-2.96**
Wood, Paper, Publishing	-0.85	0.13	0.01	**-0.71**	-0.79	0.93	0.02	0.25	**0.48**
Textiles and Apparel	20.23	10.65	-0.01	**30.87**	19.90	10.40	-0.01	-0.19	**29.85**
Other Manufacturing	-1.77	-0.84	0.02	**-2.59**	-1.71	-0.27	0.05	0.31	**-1.56**
Air transport	-0.31	-0.18	0.09	**-0.40**	-0.30	-0.07	0.18	0.16	**0.09**
Water transport	-0.01	0.02	0.01	**0.02**	0.01	0.15	0.02	0.24	**0.56**
Other Transport	-0.32	-0.13	0.23	**-0.23**	-0.33	-0.03	0.45	0.24	**0.48**
Finance	-0.16	0.00	0.39	**0.24**	-0.14	0.18	0.80	0.11	**0.98**
Insurance	-0.45	-0.19	0.84	**0.20**	-0.42	-0.07	1.72	0.16	**1.45**
Business, Professional, ICT	-0.18	0.01	0.06	**-0.11**	-0.19	0.33	0.13	0.18	**0.62**
Communications	-0.37	-0.10	0.04	**-0.42**	-0.35	0.11	0.09	0.15	**0.08**
Construction	-0.96	-0.54	0.02	**-1.47**	-0.94	-0.49	0.04	0.31	**-0.91**
Personal Services	-1.43	-0.68	0.20	**-1.91**	-1.41	-0.45	0.42	0.28	**-0.90**
Other Services	-0.57	-0.19	0.01	**-0.75**	-0.54	0.02	0.02	0.22	**-0.18**

Source: CGE model estimates

As both tariffs and NTBs are reduced on imports from the US, imports in all sectors increase somewhat with the exception of textiles and apparel (see in Table 3-12). The highest increase is found under the more ambitious scenario in the primary sector, with imports increasing by almost 5%, followed by chemicals with 4.1% increase. The highest increase in imports takes place in primary goods, chemicals, and electric machinery.

Table 3-12 Change in imports by sector (in %)

	Modest scenario				Ambitious scenario				
	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers	**Total**
Primary	1.38	1.49	0.00	**2.87**	1.44	2.77	0.00	0.44	**4.68**
Processed Food	0.79	0.34	0.01	**1.14**	0.81	0.48	0.01	0.14	**1.44**
Energy	0.47	0.02	0.02	**0.52**	0.47	0.03	0.04	-0.06	**0.45**
Chemicals	1.60	1.43	0.04	**3.07**	1.63	2.19	0.07	0.21	**4.12**
Electric Machinery	2.48	0.61	0.03	**3.11**	2.32	-0.01	0.06	-0.02	**2.73**
Vehicles	0.30	0.45	0.01	**0.75**	0.30	0.90	0.02	0.03	**1.22**
Other Transport Equipment	0.95	0.74	0.02	**1.70**	0.94	1.27	0.04	0.03	**2.29**
Metals	0.14	0.25	0.01	**0.40**	0.16	0.53	0.01	0.05	**0.72**
Wood, Paper, Publishing	0.79	0.67	0.00	**1.47**	0.79	1.04	0.01	0.14	**1.96**
Textiles and Apparel	-2.29	-1.04	0.03	**-3.30**	-2.29	-0.75	0.07	-0.32	**-3.45**
Other Manufacturing	1.28	0.50	0.00	**1.78**	1.27	0.43	0.00	0.11	**1.81**
Air transport	0.32	0.22	0.04	**0.58**	0.32	0.31	0.08	0.02	**0.70**
Water transport	0.13	0.10	0.02	**0.24**	0.15	0.18	0.04	0.15	**0.60**
Other Transport	0.53	0.36	0.15	**1.04**	0.53	0.43	0.51	0.04	**1.48**
Finance	0.50	0.23	0.17	**0.90**	0.49	0.20	0.34	0.02	**1.03**
Insurance	0.77	0.42	0.37	**1.57**	0.76	0.45	0.75	0.03	**1.95**
Business, Professional, ICT	0.45	0.27	0.06	**0.79**	0.44	0.28	0.12	-0.03	**0.75**
Communications	0.60	0.33	0.17	**1.09**	0.59	0.33	0.34	0.09	**1.31**
Construction	1.30	0.73	0.02	**2.05**	1.28	0.80	0.04	0.01	**2.03**
Personal Services	1.51	0.95	0.70	**3.16**	1.47	1.10	1.42	-0.04	**3.88**
Other Services	0.78	0.45	0.00	**1.23**	0.76	0.47	0.00	-0.12	**1.01**

Source: CGE model estimates

Changes in exports to the US are shown in Table 3-13. Exports in all sectors increase (with the exception of other sectors where there is no significant changes are taking place), with the most pronounced changes taking place in sectors where the highest initial barriers have been reduced. A very large increase in textiles and apparel is expected to take place (about 216-230%). Nevertheless, given that in this sector the share of exports to the US is relatively small currently, being around 4-5 %, the change in absolute terms would be less significant. The vehicles sector is also estimated to experience an important increase in percentage terms, with an increase of 170% under the ambitious

scenario and 80% under the modest scenario. The increase in exports under the ambitious scenario is expected to be twice as big as under the modest scenario, as NTBs are assumed to be reduced to a far greater extent under the ambitious scenario. In the vehicles sector, unlike in textiles and apparel, the biggest contribution to increase in exports comes from reductions in NTBs, thus the resulting higher increase under the ambitious scenario. Other sectors with high increase in exports to the US are primary goods, metals, processed food sectors.

Table 3-13 Change in Portugal's export to the US by sector (in %)

	Modest scenario				Ambitious scenario				
	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers	**Total**
Primary	3.68	54.61	0.02	**58.31**	4.75	132.64	0.04	-1.47	**134.69**
Processed Food	6.37	17.71	0.01	**24.10**	6.95	37.24	0.03	-0.39	**43.39**
Energy	17.40	-0.59	-0.01	**16.80**	17.52	-0.80	-0.01	0.35	**17.03**
Chemicals	7.25	11.30	-0.10	**18.45**	7.67	24.72	-0.19	-0.83	**30.57**
Electric Machinery	-4.25	14.56	-0.34	**9.98**	-3.63	40.00	-0.75	0.03	**32.85**
Vehicles	16.56	63.55	-0.01	**80.09**	21.41	155.52	-0.03	-3.63	**170.24**
Other Transport Equipment	0.91	11.89	0.01	**12.81**	1.07	25.49	0.04	-0.10	**26.06**
Metals	21.75	22.15	0.05	**43.94**	24.48	49.58	0.09	-0.56	**72.74**
Wood, Paper, Publishing	0.10	9.54	0.02	**9.66**	0.34	20.53	0.05	-0.02	**20.48**
Textiles and Apparel	150.15	79.48	-0.02	**229.60**	146.87	70.36	-0.05	-0.10	**216.10**
Other Manufacturing	14.18	-0.87	0.03	**13.35**	14.46	-0.31	0.07	0.17	**13.90**
Air transport	-0.18	-0.12	0.82	**0.52**	-0.12	-0.02	1.65	0.06	**1.47**
Water transport	0.01	0.02	3.60	**3.63**	0.08	0.19	7.31	0.06	**7.35**
Other Transport	-0.10	-0.16	3.53	**3.27**	-0.02	-0.08	7.18	-0.01	**6.84**
Finance	0.00	0.12	4.39	**4.52**	0.08	0.34	8.89	0.02	**9.18**
Insurance	-0.20	-0.02	4.54	**4.31**	-0.11	0.19	9.21	0.01	**9.10**
Business, Professional, ICT	0.26	0.18	1.25	**1.69**	0.38	0.48	2.51	0.12	**3.29**
Communications	-0.16	-0.12	0.76	**0.48**	-0.08	-0.01	1.53	0.07	**1.36**
Construction	-0.45	-0.26	1.77	**1.05**	-0.33	0.00	3.57	0.09	**3.05**
Personal Services	-0.76	-0.53	2.61	**1.32**	-0.52	-0.55	5.26	-0.14	**3.42**
Other Services	-0.34	0.10	0.02	**-0.22**	-0.20	0.38	0.04	0.01	**-0.06**

Source: CGE model estimates

Since barriers are removed on trade between all EU member states and the US, this implies indirect effects on Portuguese exports to the EU. There are some trade diversion effects taking place, together with different sectors expanding or contracting in different EU members also influencing demand for Portuguese exports to the EU. In most sectors a very marginal change would take place in Portuguese exports to the EU (see Table 3-14), with the main exceptions being electric machinery and textiles and apparel. Exports in electric machinery would decrease by about 15% due primarily to the shift in resources out of this sector and into other sectors (i.e. less supply available for export). This can also be seen in the annex tables, where we see a relatively uniform decrease in exports from this sector to all regions except the US. On the other hand there will be increased demand for textiles and apparel from Portugal in the EU resulting in about a 20% increase in export of this sector.

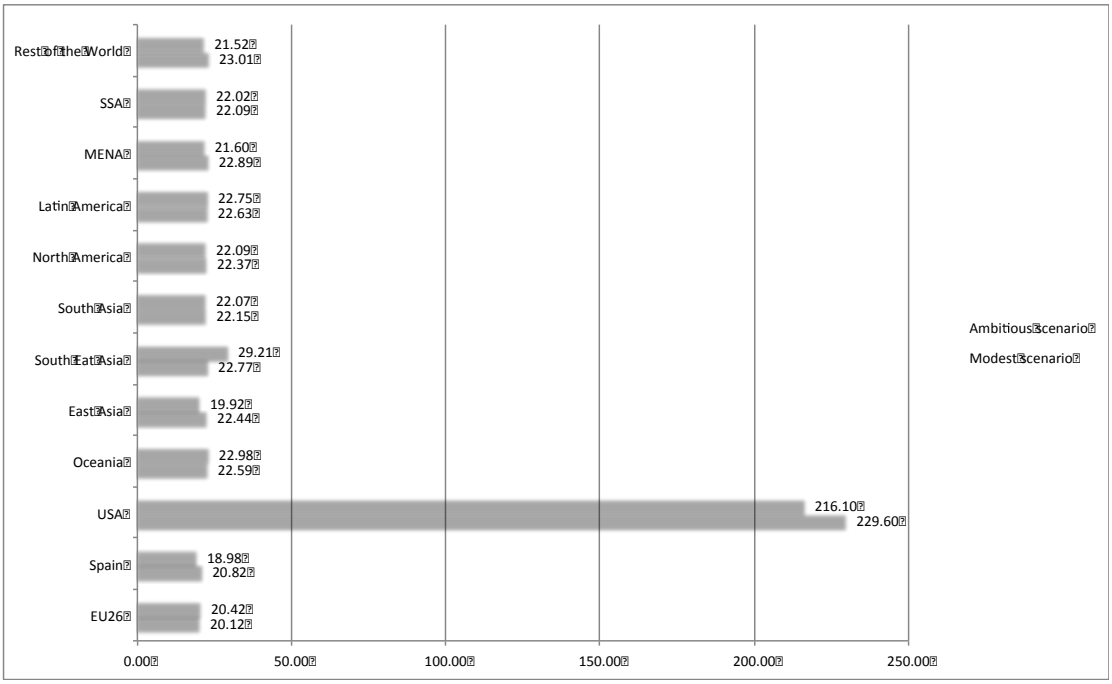
Table 3-14 Change in Portugal's exports to the EU by sector, (in %)

	Modest scenario				Ambitious scenario				
	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers	**Total**
Primary	-0.74	-0.21	0.00	**-0.95**	-0.73	-0.03	0.01	-0.55	**-1.33**
Processed Food	-0.26	0.18	0.01	**-0.07**	-0.24	0.56	0.02	-0.05	**0.28**
Energy	-0.42	-0.09	0.02	**-0.49**	-0.37	0.28	0.03	0.44	**0.54**
Chemicals	-3.51	-4.46	-0.06	**-8.03**	-3.48	-7.55	-0.11	-0.50	**-11.84**
Electric Machinery	-11.26	-3.99	-0.11	**-15.36**	-10.30	-2.13	-0.28	-0.05	**-14.74**
Vehicles	-3.41	-1.33	0.01	**-4.73**	-3.91	-2.61	0.02	-0.66	**-7.31**
Other Transport Equipment	-1.95	-1.50	0.01	**-3.44**	-1.90	-2.44	0.02	0.07	**-4.27**
Metals	-2.45	-1.55	-0.01	**-4.01**	-2.43	-2.20	-0.01	0.14	**-4.60**
Wood, Paper, Publishing	-0.79	-0.17	0.01	**-0.94**	-0.72	0.30	0.02	0.04	**-0.34**
Textiles and Apparel	12.99	7.12	0.01	**20.12**	12.89	7.95	0.03	-0.26	**20.42**
Other Manufacturing	-2.31	-0.32	0.03	**-2.60**	-2.25	0.74	0.06	-0.04	**-1.58**
Air transport	-0.28	0.02	-0.04	**-0.30**	-0.26	0.29	-0.09	0.06	**0.03**
Water transport	-0.18	0.07	-0.01	**-0.12**	-0.16	0.39	-0.03	0.13	**0.41**
Other Transport	-0.30	0.06	-0.03	**-0.27**	-0.28	0.41	-0.12	0.07	**0.12**
Finance	-0.08	0.18	-0.05	**0.05**	-0.06	0.50	-0.10	0.06	**0.41**
Insurance	-0.34	0.12	0.00	**-0.22**	-0.32	0.54	0.00	0.04	**0.28**
Business, Professional, ICT	-0.10	0.21	0.00	**0.12**	-0.07	0.62	0.00	0.06	**0.60**
Communications	-0.26	0.16	-0.02	**-0.11**	-0.22	0.59	-0.04	0.06	**0.38**
Construction	-0.70	-0.01	0.01	**-0.70**	-0.66	0.52	0.02	0.05	**-0.06**
Personal Services	-1.16	0.00	-0.01	**-1.16**	-1.11	0.77	-0.01	-0.02	**-0.37**
Other Services	-0.40	0.19	0.02	**-0.20**	-0.37	0.75	0.04	0.10	**0.54**

Source: CGE model estimates

Given that the sector, which is expected to be affected the most, is textiles and apparel, it is worth looking at how exports in this sector are changing towards different regions. Figure 15 depicts these changes under both the ambitious and modest scenario. As production expands in the sector, exports to all other regions also increase, with a very significant increase occurring in exports to the US.

Figure 15 Change in exports of Portuguese exports of textiles and apparel to the different regions (in %)



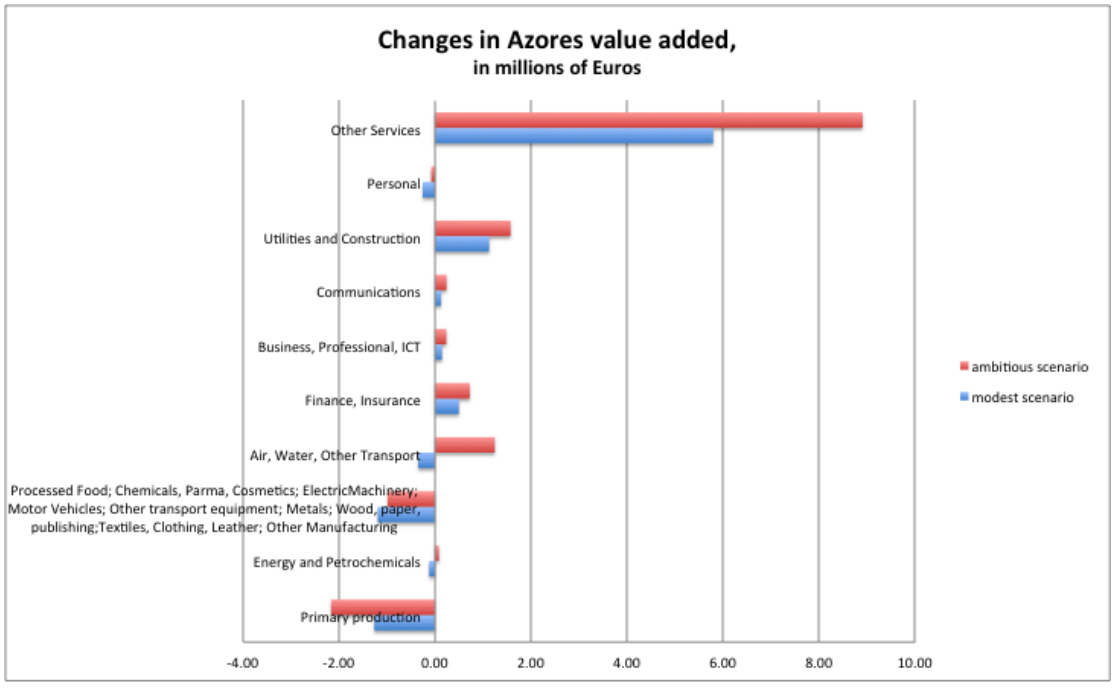
Source: CGE model estimates

3.1.3 IMPACT ON AZORES

In this section we will discuss the estimated impact of the T-TIP on Azores.[16] Changes in value added, employment and trade will be presented at sectoral level, together with a summary of the aggregate results under each component of the scenarios.

Figure 16 depicts changes in the different sectors' value added in Azores in millions of euros. The most pronounced change would take place in other services under the ambitious scenario. Most other services sectors are also expected to expand, while goods sectors are estimated to contract, although to a smaller extent.

Figure 16 Changes in value added in Azores, in millions of Euros

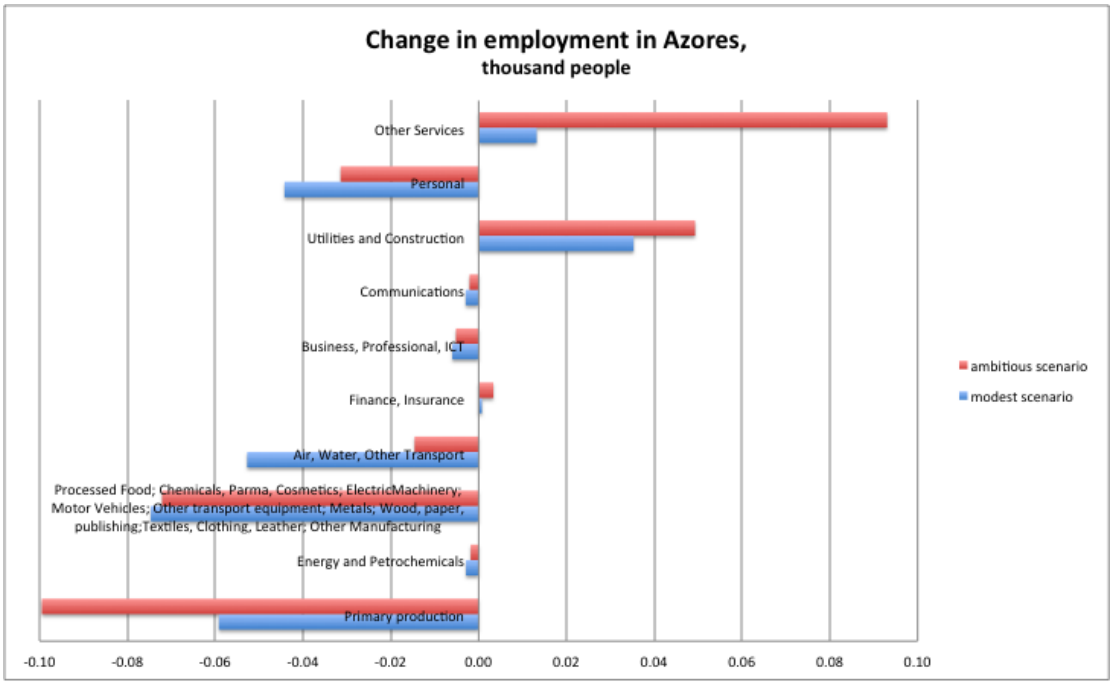


Source: Calculations based on CGE model estimates.

[16] Given data limitations on availability of detailed data on Azores, we had to make a simplifying assumption in estimating the impact on Azores. We assumed that the same % changes will occur at a sectoral level in Azores as in the corresponding sectors in Portugal as a whole. In other words for example, if the estimated impact on the output in primary products in Portugal is 0.6% reduction, the same is assumed for Azores. In addition, data was available at a different aggregation for Azores, thus this was mapped into the sectors available for Portugal.

Employment changes in Azores are depicted on Figure 17. These generally follow the main trends of changes in value added, although the expected changes in absolute terms are rather small. Employment would shift towards other services, and utilities and construction from other sectors, mostly manufacturing sectors.

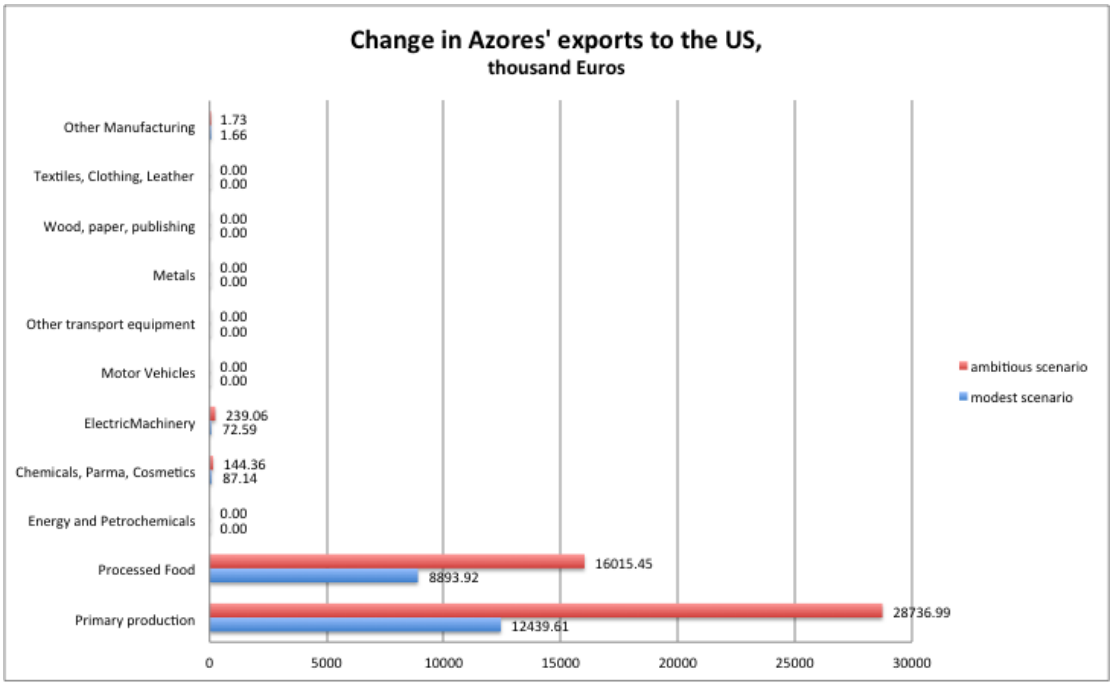
Figure 17 Change in employment in Azores



Source: CGE model estimates

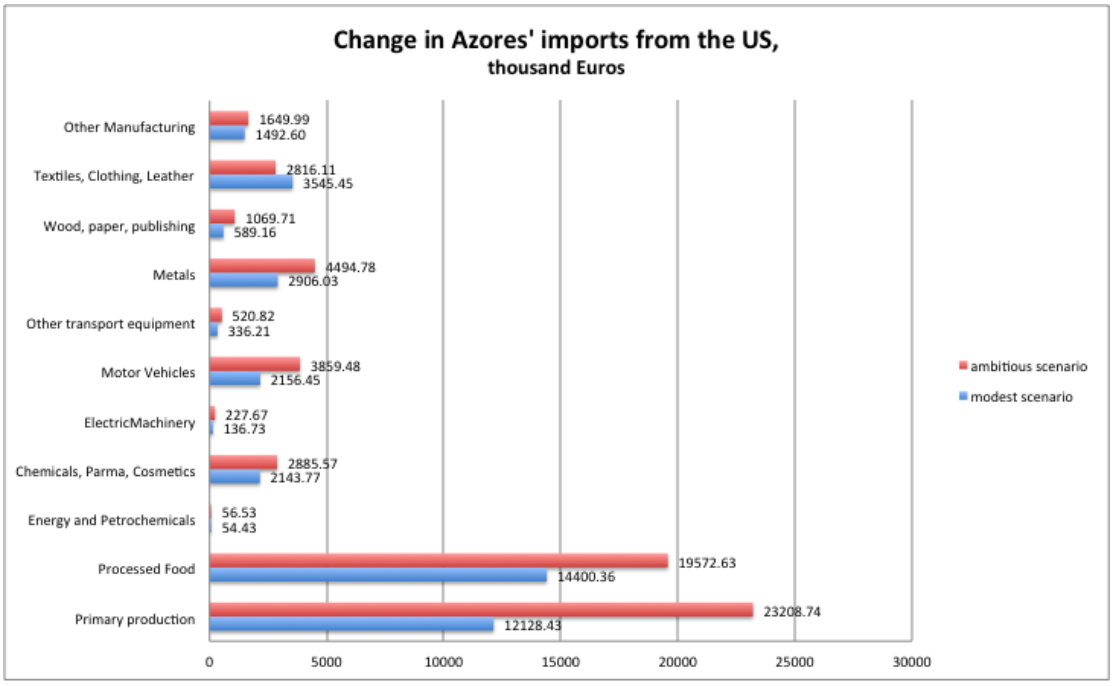
Figure 18 and Figure 19 depict changes in bilateral trade in manufacturing sectors with the US. Two sectors stand out in the case of exports; processed food and primary production, with both experiencing an important increase in exports. This is mainly due to the importance of these sectors in trade with the US and the underlying trade and tariff/NTB structure prior to T-TIP. Imports on the other hand increase somewhat in all sectors, although again, processed food and primary production, sectors with high initial barriers experience the biggest increase.

Figure 18 Change in Azores' manufacturing exports to the US



Source: CGE model estimates

Figure 19 Change in Azores' manufacturing imports from the US



Source: CGE model estimates

Table 3-15 summarizes the resulting macro changes decomposed into tariffs, NTBs, and spillovers under both the modest and ambitious scenarios. The GDP is

expected to increase overall by 0.19% under the modest scenario, and by 0.35% under the ambitious scenario. While under the modest scenario the biggest impact comes from tariff reductions, under the ambitious scenario NTB reductions are slightly more important. Employment is expected to decrease with a rather marginal change occurring under the ambitious scenario. Manufacturing trade with the EU (except Portugal) is expected to change only by less than 1 %. On the other hand there is an important estimated impact on manufacturing trade with the US with rather large increases taking place especially under the ambitious scenario.

Table 3-15 Macro changes in Azores' economy (in %)

	Modest scenario				Ambitious scenario				
% Changes in	**Total**	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers
GDP	0.19	0.11	0.06	0.11	0.35	0.14	0.15	0.05	0.22
Employment	-0.19	-0.14	-0.05	0.00	-0.08	-0.14	0.01	0.01	0.04
Manufacturing exports to the EU	-0.51	-0.52	0.00	0.01	-0.32	-0.50	0.30	0.02	-0.12
Manufacturing exports to the US	36.15	5.28	30.86	0.01	75.92	6.03	71.40	0.02	-0.77
Manufacturing imports from the EU	0.21	0.34	-0.13	0.00	-0.39	0.32	-0.59	0.00	-0.09
Manufacturing imports from the US	44.92	24.93	19.97	0.02	67.97	26.56	41.11	0.05	-0.07

Source: CGE model estimates

Given the relatively small size of the Azores economy, and that most of its manufacturing trade is taking place in two main sectors, processed food and primary manufacturing, and in addition its trade in manufacturing is higher with the US than with the EU, the T-TIP is expected to have an important impact on these two main sectors' bilateral trade with the US. In addition, value added and employment is estimated to increase in the "other services" sector, which is the single most important sector in the Azores economy (see Figure 9).[17]

[17] Unfortunately no data were available for trade in services sectors thus changes in these sectors trade could not be estimated.

3.2 PARTIAL EQUILIBIUM

We turn next to a partial equilibrium (PE) assessment of trade for specific products. This is based on the GSIM simulation model (Francois and Manchin 2010), and the analysis here is not linked to the main CGE assessment. Unlike the core assessment based on the CGE model, the partial equilibrium model we work with in this section is designed to look at more specific sectors, beyond those we can cover in a CGE model. Given the data restrictions when using CGE analysis, more detailed or disaggregated product categories can only be investigated by partial equilibrium analysis. To do this, we look at these sectors in isolation from the broader impact across sectors. As such, while the PE assessment here helps us to gauge possible effects for individual sectors lost in the aggregation of the CGE model, we must also keep in mind that general equilibrium effects (like competition across sectors for capital and labour) and longer-run effects linked to investment are not explicitly included in the model. With these caveats in mind, the pattern of results from the PE analysis does provide insight into the cross-scenario variation in impacts on individual sectors.

We focus on the following sectors: textiles and clothing (HS 63 excluding 6309, HS61, 62, 60, 59, 51, 52); footwear (HS 64), wine (HS 2204), pharmaceuticals (HS 30), machinery (HS 8525, 8504, 8536, 8544). The potential impact of T-TIP in these sectors will hinge on both relative market shares for destination markets (where Portuguese producers export) and underlying barriers.

Table 3-16 Exports and trade barriers in the different sectors

	Portuguese exports to US, million dollars	Bilateral share of all exports (in %)	Current US tariffs (in %)	US NTBs based trade cost reductions (ambitious scenario)[18]
certain wine products	76.0	9.99	9.90	18.33
certain footwear products	53.3	2.25	12.09	22.00
certain pharmaceutical products	34.2	4.35	0.00	2.37
certain textiles & clothing	229.1	8.38	10.65	4.18
certain machinery products	66.7	2.34	0.94	2.90

Source: WITS and Ecorys (2009)

Table 3-16 above summarizes the scope for these potential effects under T-TIP. Estimated NTBs are directly taken from the ECORYS study, estimated either for the exact products we are looking at here or from the broader aggregates (see details in Table 2-2).

Table 3-17 below presents our estimates of the potential impact of T-TIP, following the same basic scenario structure as in the CGE assessment. We focus on the potential impact on Portuguese production, working from a 2011 baseline level of production and trade.[19]

From the table, a number of results stand out. For all products the deeper the trade agreement between the EU and the US the greater is the potential impact on Portuguese industry. This is fully consistent with our discussion above of potential liberalization. The biggest change would happen in the footwear products. This is due to these products facing the highest barriers prior to liberalisation. As these barriers are removed, output expands by 1-2.45% and exports increase to the US substantially, by 222-540%. Textiles and clothing products also had higher tariff barriers prior to liberalisation resulting in a significant export increase to the US, much less than footwear, but still quite

[18] See discussion above.

[19] While the CGE model has been projected along a macroeconomic baseline, we work here with current rather than projected data, as we have no basis for projections at the detailed product level.

high, between 131-170%. Exports of all other products also increase to the US, albeit to a lesser extent.

Table 3-17 Partial equilibrium analysis, % changes

	less ambitious scenario			more ambitious scenario		
	output, % change	producer price, % change	exports to United States, % change	output, % change	producer price, % change	exports to United States, % change
certain wine products	-0.01	0.00	36.88	0.35	0.16	59.05
certain footwear products	1.04	1.04	221.55	2.45	2.45	539.78
certain pharmaceutical products	-0.13	-0.06	6.56	-0.17	-0.08	15.95
certain textiles & clothing	0.59	0.27	130.75	0.77	0.35	169.71
certain machinery products	0.07	0.03	20.40	0.24	0.11	33.56

Source: Partial equilibrium estimates

4 Overview and conclusions

This study undertakes a quantitative assessment of the likely impact of a T-TIP on the Portuguese economy. Given the uncertainty regarding the exact terms of the final agreement, different scenarios were assumed estimating the potential impact on different time horizons. A modest scenario assumed an almost complete elimination of tariffs with 10 % of NTBs being eliminated, while a more ambitious scenario assumed complete elimination of tariffs and 25 % of NTBs .

The main body of the report discusses in detail the outcome of both of these scenarios over the long-run assuming a certain level of structural unemployment remaining in the economy (while the results for the short-run and for the long-run assuming full employment are presented in the Annex). We also presented partial equilibrium effects for detailed product categories.

We identify two sectors with the greatest impact, textiles & apparel (positive output changes), and electric machinery (contraction). In the case of electrical machinery, this sector is part of a European industry that, from earlier studies, we know will be on the downside of adjustment across continental Europe. In particular, estimated changes in production of electrical machinery in the EU, and specifically in Portugal, are consistent with estimates reported in the ECORYS (2009) study and the CEPR (2013) study.

Our partial equilibrium analysis has looked at the potential impact of removal of barriers to trade in certain wine, footwear, pharmaceutical, textiles and clothing, and machinery products. The results indicate that the most pronounced change in terms of both output (1-2.5 % increase) and exports to the US (222-540 % increase) would take place in certain footwear products. This is because of high US tariffs in this sector.

For the Azores, we find that gross value added in million euros would increase from about 3279 to 3284 under the modest scenario over the long-run, and to about 3289 million euros over the ambitious scenario. Parallel to this increase in value added, there would be a substantial increase in bilateral trade in goods

with the US, mainly attributable to an increase in trade in processed food and primary products.

As T-TIP is fully implemented, we also estimate that port traffic would increase in a range from 1.0 to 1.8 %.

The estimated long-run impact for Portugal (allowing for some impact on employment levels) ranges from 0.57% of GDP under a shallow agreement to 0.76% of GDP under a deep agreement. In addition, the results indicate that for Portugal, tariffs are just as important as NTB cost reductions, which is in contrast to the EU as a whole, where NTBs are the most important element of a T-TIP. This includes positive labour market effects (more jobs in the shorter term, higher wages in the longer term). Basically, this means that for Portugal, immediate tariff elimination is more beneficial for Portugal than for the EU overall. Moreover, given that there are proportionately more gains for Portugal from tariff reductions than the EU as a whole, Portugal is likely to benefit earlier, and to a greater extent, from the initial stages of T-TIP implementation.

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APPENDIX A ADDITIONAL RESULTS

Short-run results for Portugal

The results presented in the following tables are based on the short-run assumptions explained in the scenario section in the main text. We assume here that the liberalization is immediate.

Macro Impacts on Portugal

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers	**Total**
GDP, %	0.31	0.34	0.01	**0.66**	0.66	0.95	0.03	-0.22	**1.29**
National Income, million	564.44	592.39	7.67	**1164.48**	1198.22	1676.82	45.43	-407.12	**2276.83**
Consumer Prices, %	0.03	0.06	0.00	**0.08**	0.05	0.15	0.00	-0.11	**0.05**
Exports, %	0.67	0.60	0.03	**1.30**	0.88	1.25	0.07	-0.18	**1.92**
Imports, %	0.54	0.45	0.02	**1.02**	0.87	1.24	0.07	-0.20	**1.87**
Terms of Trade, %	0.02	0.00	0.00	**0.03**	0.01	0.00	0.00	-0.01	**0.00**
low skill wages, %	-0.03	-0.06	0.00	**-0.08**	-0.05	-0.15	0.00	0.11	**-0.05**
medium skill wages, %	-0.03	-0.06	0.00	**-0.08**	-0.05	-0.15	0.00	0.11	**-0.05**
high skill wages, %	-0.03	-0.06	0.00	**-0.08**	-0.05	-0.15	0.00	0.11	**-0.05**

Change in Low Skilled Employment by Sector, %

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers	**Total**
Primary	-0.03	-0.13	0.00	**-0.15**	-0.01	-0.43	0.01	-0.46	**-0.99**
Proccessd Food	0.24	0.58	0.00	**0.82**	0.56	1.21	0.03	-0.37	**1.27**
Energy	0.38	0.16	0.01	**0.55**	0.48	0.23	0.03	-0.06	**0.64**
Chemicals	0.05	0.35	-0.01	**0.39**	-0.04	0.08	0.01	-0.65	**-0.86**
Electric Machinery	0.17	0.08	-0.01	**0.24**	-1.31	0.39	-0.03	-0.23	**-1.08**
Vehicles	-0.52	1.29	0.00	**0.77**	-0.93	3.18	0.02	-0.37	**1.80**
Other Transport Equipn	-0.31	-0.18	0.00	**-0.49**	-0.43	-0.31	0.03	-0.21	**-0.99**
Metals	-0.05	0.09	0.01	**0.05**	-0.49	-0.01	0.02	-0.11	**-0.64**
Wood, Paper, Publishin	0.15	0.39	0.00	**0.54**	0.01	0.84	0.02	-0.09	**0.74**
Textiles and Apparel	3.85	2.44	0.02	**6.31**	8.68	6.46	0.05	-1.57	**12.58**
Other Manufacturing	0.28	0.43	0.00	**0.71**	0.23	1.29	0.04	-0.26	**1.17**
Airtransport	0.01	0.06	0.06	**0.12**	0.01	0.08	0.13	0.07	**0.30**
Watertransport	0.36	0.37	0.01	**0.74**	0.61	1.01	0.03	-0.01	**1.68**
Other Transport	0.23	0.30	0.09	**0.62**	0.60	0.94	0.14	-0.21	**1.35**
Finance	0.53	0.56	0.01	**1.10**	1.02	1.45	0.05	-0.41	**1.90**
Insurance	0.30	0.31	0.05	**0.66**	0.66	0.94	0.11	-0.26	**1.32**
Business, Professional,	0.42	0.50	0.00	**0.92**	0.88	1.34	0.04	-0.37	**1.70**
Communications	0.42	0.50	-0.03	**0.88**	0.85	1.31	-0.01	-0.36	**1.60**
Construction	0.05	0.07	0.00	**0.12**	0.64	1.03	0.05	-0.26	**1.36**
Personal Services	0.27	0.33	-0.05	**0.55**	0.54	0.96	-0.06	-0.24	**1.05**
Other Services	0.41	0.45	0.00	**0.86**	0.87	1.27	0.03	-0.33	**1.66**

Change in Medium Skilled Employment by Sector, %

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers	**Total**
Primary	-0.03	-0.13	0.00	**-0.15**	-0.02	-0.43	0.01	-0.46	**-0.99**
Proccessd Food	0.24	0.58	0.00	**0.82**	0.55	1.21	0.03	-0.37	**1.26**
Energy	0.38	0.16	0.01	**0.55**	0.47	0.23	0.03	-0.05	**0.64**
Chemicals	0.05	0.35	-0.01	**0.39**	-0.06	0.08	0.01	-0.65	**-0.87**
Electric Machinery	0.17	0.08	-0.01	**0.24**	-1.32	0.39	-0.03	-0.23	**-1.08**
Vehicles	-0.53	1.30	0.00	**0.77**	-0.94	3.19	0.02	-0.36	**1.79**
Other Transport Equipn	-0.32	-0.17	0.00	**-0.49**	-0.44	-0.31	0.03	-0.20	**-1.00**
Metals	-0.06	0.10	0.01	**0.05**	-0.50	-0.01	0.02	-0.10	**-0.64**
Wood, Paper, Publishin	0.15	0.40	0.00	**0.55**	-0.01	0.84	0.02	-0.09	**0.73**
Textiles and Apparel	3.84	2.45	0.02	**6.31**	8.67	6.46	0.05	-1.57	**12.57**
Other Manufacturing	0.28	0.43	0.00	**0.71**	0.22	1.29	0.04	-0.25	**1.17**
Airtransport	0.00	0.07	0.06	**0.13**	-0.01	0.08	0.12	0.08	**0.29**
Watertransport	0.36	0.37	0.01	**0.74**	0.59	1.01	0.03	0.00	**1.67**
Other Transport	0.23	0.30	0.09	**0.62**	0.58	0.94	0.14	-0.20	**1.34**
Finance	0.52	0.57	0.01	**1.10**	1.01	1.45	0.05	-0.41	**1.89**
Insurance	0.29	0.32	0.05	**0.66**	0.65	0.94	0.11	-0.25	**1.31**
Business, Professional,	0.42	0.50	0.00	**0.92**	0.87	1.34	0.04	-0.37	**1.69**
Communications	0.42	0.50	-0.03	**0.88**	0.83	1.31	-0.01	-0.36	**1.59**
Construction	0.04	0.07	0.00	**0.12**	0.63	1.04	0.05	-0.26	**1.35**
Personal Services	0.27	0.33	-0.05	**0.56**	0.53	0.96	-0.06	-0.23	**1.05**
Other Services	0.41	0.45	0.00	**0.87**	0.85	1.27	0.03	-0.33	**1.65**

Change in High Skilled Employment by Sector, %

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers	**Total**
Primary	-0.03	-0.13	0.00	**-0.15**	-0.02	-0.43	0.01	-0.46	**-0.99**
Proccessed Food	0.24	0.58	0.00	**0.82**	0.56	1.21	0.03	-0.37	**1.27**
Energy	0.38	0.16	0.01	**0.55**	0.47	0.24	0.03	-0.06	**0.64**
Chemicals	0.05	0.35	-0.01	**0.40**	-0.05	0.09	0.01	-0.65	**-0.86**
Electric Machinery	0.17	0.09	-0.01	**0.24**	-1.32	0.39	-0.03	-0.23	**-1.08**
Vehicles	-0.52	1.30	0.00	**0.77**	-0.94	3.19	0.02	-0.36	**1.80**
Other Transport Equipn	-0.32	-0.17	0.00	**-0.49**	-0.44	-0.31	0.03	-0.20	**-0.99**
Metals	-0.06	0.10	0.01	**0.05**	-0.50	-0.01	0.02	-0.10	**-0.64**
Wood, Paper, Publishin	0.15	0.40	0.00	**0.55**	0.00	0.85	0.02	-0.09	**0.74**
Textiles and Apparel	3.84	2.45	0.02	**6.31**	8.67	6.46	0.05	-1.57	**12.58**
Other Manufacturing	0.28	0.43	0.00	**0.71**	0.22	1.29	0.04	-0.26	**1.17**
Airtransport	0.01	0.07	0.06	**0.13**	0.00	0.09	0.13	0.08	**0.30**
Watertransport	0.36	0.37	0.01	**0.74**	0.60	1.01	0.03	0.00	**1.68**
Other Transport	0.23	0.31	0.09	**0.62**	0.58	0.94	0.14	-0.20	**1.35**
Finance	0.53	0.57	0.01	**1.11**	1.01	1.46	0.05	-0.41	**1.90**
Insurance	0.29	0.32	0.05	**0.67**	0.65	0.95	0.11	-0.25	**1.32**
Business, Professional,	0.42	0.50	0.00	**0.93**	0.87	1.34	0.04	-0.37	**1.70**
Communications	0.42	0.50	-0.03	**0.89**	0.84	1.31	-0.01	-0.36	**1.60**
Construction	0.05	0.07	0.00	**0.12**	0.63	1.04	0.05	-0.26	**1.36**
Personal Services	0.27	0.34	-0.05	**0.56**	0.53	0.96	-0.06	-0.24	**1.05**
Other Services	0.41	0.45	0.01	**0.87**	0.86	1.27	0.04	-0.33	**1.66**

Change in Output by Sector, %

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers	**Total**
Primary	-0.01	-0.07	0.00	**-0.08**	-0.09	-0.48	0.01	-0.35	**-0.99**
Proccessed Food	0.11	0.26	0.00	**0.37**	0.17	0.59	0.01	-0.19	**0.51**
Energy	0.11	0.04	0.00	**0.15**	0.16	-0.19	0.02	0.07	**0.07**
Chemicals	0.03	0.19	0.00	**0.22**	-0.33	-0.34	0.00	-0.46	**-1.30**
Electric Machinery	0.09	0.04	-0.01	**0.13**	-1.46	-0.10	-0.04	-0.07	**-1.51**
Vehicles	-0.24	0.60	0.00	**0.36**	-1.16	2.26	0.00	-0.16	**0.92**
Other Transport Equipn	-0.22	-0.12	0.00	**-0.34**	-0.59	-0.57	0.02	-0.11	**-1.28**
Metals	-0.03	0.06	0.01	**0.03**	-0.69	-0.35	0.01	0.01	**-1.02**
Wood, Paper, Publishin	0.08	0.21	0.00	**0.28**	-0.31	0.29	0.00	0.05	**0.08**
Textiles and Apparel	2.65	1.69	0.01	**4.35**	7.80	5.66	0.04	-1.36	**11.22**
Other Manufacturing	0.18	0.28	0.00	**0.46**	-0.02	0.85	0.03	-0.14	**0.66**
Airtransport	0.00	0.06	0.05	**0.12**	-0.05	0.02	0.12	0.09	**0.21**
Watertransport	0.15	0.15	0.01	**0.31**	0.04	0.17	0.01	0.20	**0.55**
Other Transport	0.15	0.20	0.06	**0.40**	0.25	0.44	0.12	-0.06	**0.70**
Finance	0.22	0.24	0.01	**0.47**	0.50	0.71	0.03	-0.19	**0.94**
Insurance	0.24	0.26	0.04	**0.54**	0.50	0.72	0.10	-0.19	**1.03**
Business, Professional,	0.13	0.16	0.00	**0.29**	0.29	0.47	0.01	-0.12	**0.59**
Communications	0.16	0.19	-0.01	**0.34**	0.32	0.54	-0.02	-0.13	**0.63**
Construction	0.03	0.04	0.00	**0.08**	0.33	0.57	0.04	-0.13	**0.76**
Personal Services	0.20	0.24	-0.03	**0.41**	0.32	0.64	-0.07	-0.15	**0.66**
Other Services	0.31	0.34	0.00	**0.66**	0.64	0.95	0.03	-0.24	**1.24**

Change in Exports by Sector, %

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers	**Total**
Primary	-0.27	0.69	0.00	**0.42**	-0.94	0.65	-0.01	-0.09	**-0.29**
Proccessed Food	0.09	0.48	0.00	**0.56**	-0.21	0.83	-0.01	0.16	**0.84**
Energy	4.15	-0.58	-0.04	**3.53**	3.87	-2.15	-0.06	0.69	**2.64**
Chemicals	-0.02	0.19	-0.01	**0.16**	-0.83	-0.81	-0.01	-0.45	**-2.25**
Electric Machinery	0.19	0.12	0.00	**0.31**	-1.85	-0.46	-0.06	0.06	**-2.03**
Vehicles	-0.32	1.02	0.00	**0.70**	-1.37	3.32	0.00	-0.09	**1.86**
Other Transport Equipn	-0.01	0.71	0.00	**0.69**	-0.70	0.79	0.01	0.07	**0.19**
Metals	-0.06	-0.05	0.01	**-0.10**	-0.99	-0.93	0.00	0.28	**-1.51**
Wood, Paper, Publishin	-0.02	0.35	0.00	**0.33**	-0.80	0.37	-0.01	0.34	**0.06**
Textiles and Apparel	5.66	3.26	0.02	**8.94**	13.31	8.75	0.05	-1.89	**18.88**
Other Manufacturing	0.52	0.27	0.00	**0.79**	-0.06	0.72	0.03	0.02	**0.72**
Airtransport	-0.05	0.00	0.09	**0.04**	-0.18	-0.16	0.19	0.16	**0.07**
Watertransport	0.12	0.12	0.01	**0.26**	-0.05	0.05	0.02	0.29	**0.50**
Other Transport	-0.12	-0.03	0.24	**0.09**	-0.34	-0.27	0.50	0.28	**0.29**
Finance	-0.34	-0.27	0.35	**-0.26**	-0.63	-0.58	0.71	0.22	**-0.17**
Insurance	-0.18	-0.15	0.85	**0.52**	-0.48	-0.39	1.72	0.19	**1.10**
Business, Professional,	-0.28	-0.13	0.03	**-0.38**	-0.61	-0.31	0.09	0.23	**-0.51**
Communications	-0.41	-0.32	0.03	**-0.70**	-0.91	-0.90	0.04	0.35	**-1.26**
Construction	0.00	0.18	0.02	**0.20**	-0.58	-0.29	0.05	0.19	**-0.52**
Personal Services	-0.26	-0.04	0.23	**-0.07**	-0.93	-0.36	0.45	0.29	**-0.44**
Other Services	-0.14	0.01	0.00	**-0.13**	-0.44	-0.10	0.00	0.20	**-0.26**

Change in Imports by Sector, %

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs: Goods	NTBs: Services	**Total**	Tariffs	NTBs: Goods	NTBs: Services	Spillovers	**Total**
Primary	0.85	1.19	0.00	**2.04**	1.70	3.51	0.03	0.12	**5.22**
Proccessed Food	0.69	0.39	0.01	**1.08**	1.19	1.11	0.03	-0.18	**2.00**
Energy	0.86	0.34	0.02	**1.22**	1.10	0.90	0.06	-0.31	**1.59**
Chemicals	0.52	0.34	0.01	**0.87**	1.19	1.40	0.03	-0.11	**2.41**
Electric Machinery	0.22	0.24	0.00	**0.47**	0.88	0.66	0.03	-0.15	**1.33**
Vehicles	0.31	0.56	0.00	**0.87**	0.59	1.67	0.03	-0.20	**1.97**
Other Transport Equipn	0.47	0.60	0.01	**1.09**	1.07	1.98	0.05	-0.14	**2.88**
Metals	0.22	0.23	0.00	**0.45**	0.45	0.94	0.03	-0.08	**1.29**
Wood, Paper, Publishin	0.35	0.60	0.01	**0.96**	1.03	1.69	0.03	-0.19	**2.42**
Textiles and Apparel	1.34	0.64	-0.01	**1.97**	-0.37	-0.67	0.01	0.29	**-0.60**
Other Manufacturing	0.33	0.01	0.00	**0.34**	0.79	0.27	0.02	-0.05	**1.01**
Airtransport	0.31	0.32	0.04	**0.66**	0.64	0.90	0.09	-0.25	**1.25**
Watertransport	0.21	0.18	0.02	**0.41**	0.28	0.43	0.05	0.08	**0.92**
Other Transport	0.40	0.35	0.18	**0.93**	0.90	1.23	0.57	-0.29	**2.28**
Finance	0.60	0.52	0.18	**1.30**	1.19	1.35	0.39	-0.40	**2.33**
Insurance	0.48	0.43	0.40	**1.31**	1.10	1.26	0.84	-0.33	**2.71**
Business, Professional,	0.53	0.37	0.06	**0.95**	1.17	1.34	0.16	-0.39	**2.05**
Communications	0.63	0.59	0.19	**1.41**	1.38	1.71	0.43	-0.40	**2.88**
Construction	0.18	0.06	0.01	**0.25**	1.09	1.16	0.05	-0.25	**1.85**
Personal Services	0.51	0.56	0.64	**1.70**	1.49	1.83	1.35	-0.42	**4.08**
Other Services	0.45	0.41	0.00	**0.86**	1.05	1.26	0.02	-0.46	**1.64**

Change in Portugal's exports to the US by Sector, %

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs: Goods	NTBs: Services	**Total**	Tariffs	NTBs: Goods	NTBs: Services	Spillovers	**Total**
Primary	5.41	56.80	0.01	**62.22**	5.18	133.29	-0.01	-1.40	**135.62**
Proccessed Food	6.70	17.24	-0.01	**23.94**	6.80	36.23	0.01	-0.34	**42.32**
Energy	16.51	-0.71	-0.05	**15.75**	16.25	-2.61	-0.07	0.64	**14.43**
Chemicals	10.91	13.79	-0.02	**24.67**	10.21	28.47	-0.01	-0.97	**37.09**
Electric Machinery	9.02	22.20	-0.09	**31.13**	7.54	43.39	-0.30	-0.42	**49.52**
Vehicles	18.18	54.95	-0.05	**73.08**	20.06	133.85	0.00	-2.80	**149.22**
Other Transport Equipn	2.63	12.15	-0.01	**14.77**	1.90	24.43	0.04	-0.16	**25.89**
Metals	23.72	21.93	0.00	**45.65**	24.54	46.09	0.09	-0.67	**69.67**
Wood, Paper, Publishin	0.93	9.18	-0.02	**10.09**	0.25	18.84	0.05	0.06	**19.07**
Textiles and Apparel	107.14	56.18	-0.03	**163.29**	126.36	61.69	0.10	-2.57	**182.74**
Other Manufacturing	16.58	-0.28	-0.02	**16.28**	16.08	-0.25	0.07	-0.15	**15.46**
Airtransport	0.07	-0.09	0.78	**0.76**	-0.04	-0.25	1.63	0.06	**1.34**
Watertransport	0.10	-0.19	3.58	**3.49**	-0.24	-0.62	7.28	0.08	**6.36**
Other Transport	0.12	-0.24	3.44	**3.31**	-0.15	-0.72	7.10	0.05	**6.14**
Finance	-0.17	-0.42	4.30	**3.72**	-0.46	-0.66	8.77	0.14	**7.82**
Insurance	0.05	-0.29	4.42	**4.18**	-0.23	-0.45	9.08	0.02	**8.34**
Business, Professional,	0.05	-0.43	1.20	**0.82**	-0.25	-0.68	2.44	0.08	**1.53**
Communications	-0.17	-0.54	0.83	**0.11**	-0.65	-1.21	1.56	0.26	**0.01**
Construction	0.52	-0.15	1.72	**2.09**	-0.05	-0.59	3.52	0.02	**2.76**
Personal Services	0.44	-0.86	2.60	**2.17**	-0.26	-1.57	5.21	-0.22	**2.83**
Other Services	0.19	-0.21	-0.02	**-0.04**	-0.12	-0.15	0.02	-0.02	**-0.35**

Change in Portugal's exports to the EU by Sector, %

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs: Goods	NTBs: Services	**Total**	Tariffs	NTBs: Goods	NTBs: Services	Spillovers	**Total**
Primary	-0.32	0.10	0.00	**-0.22**	-0.96	-0.71	-0.02	-0.51	**-2.16**
Proccessed Food	-0.18	0.13	0.00	**-0.05**	-0.47	0.08	-0.01	0.03	**-0.32**
Energy	-1.29	-0.42	-0.02	**-1.73**	-1.59	-1.41	-0.05	0.66	**-2.07**
Chemicals	-0.62	-0.35	-0.01	**-0.98**	-1.49	-2.33	0.00	-0.55	**-4.54**
Electric Machinery	-0.24	-1.01	-0.01	**-1.26**	-2.26	-2.36	-0.04	-0.34	**-4.78**
Vehicles	-1.81	-1.19	0.00	**-3.00**	-3.15	-2.29	0.00	-0.22	**-5.66**
Other Transport Equipn	-0.74	-0.88	0.00	**-1.61**	-1.43	-2.46	0.02	-0.01	**-3.89**
Metals	-0.68	-0.50	0.01	**-1.18**	-1.64	-1.66	0.01	0.06	**-3.24**
Wood, Paper, Publishin	-0.06	-0.11	0.00	**-0.17**	-0.82	-0.42	0.00	0.17	**-0.95**
Textiles and Apparel	0.32	0.57	0.03	**0.92**	7.15	6.42	0.07	-2.01	**10.32**
Other Manufacturing	-0.25	0.47	0.00	**0.23**	-0.81	1.55	0.05	-0.20	**0.52**
Airtransport	-0.12	0.09	-0.05	**-0.08**	-0.25	0.10	-0.11	0.06	**-0.17**
Watertransport	-0.08	0.09	-0.02	**-0.01**	-0.46	-0.16	-0.06	0.20	**-0.38**
Other Transport	-0.12	0.17	-0.06	**0.00**	-0.41	0.11	-0.16	0.14	**-0.25**
Finance	-0.34	-0.18	-0.07	**-0.60**	-0.61	-0.36	-0.18	0.18	**-0.89**
Insurance	-0.21	0.07	0.05	**-0.09**	-0.48	0.15	-0.02	0.10	**-0.22**
Business, Professional,	-0.26	0.05	-0.03	**-0.25**	-0.54	0.21	-0.02	0.13	**-0.16**
Communications	-0.40	-0.18	-0.04	**-0.62**	-0.88	-0.50	-0.10	0.27	**-1.07**
Construction	0.06	0.41	-0.01	**0.46**	-0.48	0.49	0.03	0.02	**0.11**
Personal Services	-0.25	0.40	-0.03	**0.11**	-0.86	0.82	-0.04	0.09	**0.05**
Other Services	-0.15	0.25	0.00	**0.11**	-0.41	0.43	0.01	0.10	**0.15**

Change in Portugal's value-added by sector, %

	Modest scenario				Ambitious scenario				
	Tariffs	NTBs: Goods	NTBs: Services	**Total**	Tariffs	NTBs: Goods	NTBs: Services	Spillovers	**Total**
Primary	-0.01	-0.07	0.00	**-0.08**	-0.09	-0.48	0.01	-0.35	**-0.99**
Proccessed Food	0.11	0.26	0.00	**0.37**	0.17	0.59	0.01	-0.19	**0.51**
Energy	0.11	0.04	0.00	**0.15**	0.16	-0.19	0.02	0.07	**0.07**
Chemicals	0.03	0.19	0.00	**0.22**	-0.33	-0.34	0.00	-0.46	**-1.30**
Electric Machinery	0.09	0.04	-0.01	**0.13**	-1.46	-0.10	-0.04	-0.07	**-1.51**
Vehicles	-0.24	0.60	0.00	**0.36**	-1.16	2.26	0.00	-0.16	**0.92**
Other Transport Equipn	-0.22	-0.12	0.00	**-0.34**	-0.59	-0.57	0.02	-0.11	**-1.28**
Metals	-0.03	0.06	0.01	**0.03**	-0.69	-0.35	0.01	0.01	**-1.02**
Wood, Paper, Publishin	0.08	0.21	0.00	**0.28**	-0.31	0.29	0.00	0.05	**0.08**
Textiles and Apparel	2.65	1.69	0.01	**4.35**	7.80	5.66	0.04	-1.36	**11.22**
Other Manufacturing	0.18	0.28	0.00	**0.46**	-0.02	0.85	0.03	-0.14	**0.66**
Airtransport	0.00	0.06	0.05	**0.12**	-0.05	0.02	0.12	0.09	**0.21**
Watertransport	0.15	0.15	0.01	**0.31**	0.04	0.17	0.01	0.20	**0.55**
Other Transport	0.15	0.20	0.06	**0.40**	0.25	0.44	0.12	-0.06	**0.70**
Finance	0.22	0.24	0.01	**0.47**	0.50	0.71	0.03	-0.19	**0.94**
Insurance	0.24	0.26	0.04	**0.54**	0.50	0.72	0.10	-0.19	**1.03**
Business, Professional,	0.13	0.16	0.00	**0.29**	0.29	0.47	0.01	-0.12	**0.59**
Communications	0.16	0.19	-0.01	**0.34**	0.32	0.54	-0.02	-0.13	**0.63**
Construction	0.03	0.04	0.00	**0.08**	0.33	0.57	0.04	-0.13	**0.76**
Personal Services	0.20	0.24	-0.03	**0.41**	0.32	0.64	-0.07	-0.15	**0.66**
Other Services	0.31	0.34	0.00	**0.66**	0.64	0.95	0.03	-0.24	**1.24**

Portugal exports of electric machinery to different regions, % change

	Modest scenario				Ambitious scenario				
	Tariffs	NTBs: Goods	NTBs: Services	**Total**	Tariffs	NTBs: Goods	NTBs: Services	Spillovers	**Total**
EU26	-0.24	-1.01	-0.01	-1.26	-2.26	-2.36	-0.04	-0.34	-4.78
Spain	-0.18	-0.55	-0.02	-0.75	-2.24	-1.36	-0.07	-0.18	-3.66
USA	9.02	22.20	-0.09	31.13	7.54	43.39	-0.30	-0.42	49.52
Oceania	0.00	-0.46	0.00	-0.46	-2.13	-2.20	-0.06	0.92	-2.86
East Asia	-0.02	-0.67	-0.01	-0.70	-2.28	-2.43	-0.05	1.01	-2.98
South East Asia	0.06	-0.71	-0.02	-0.67	-2.01	-2.99	-0.11	1.14	-3.35
South Asia	-0.04	0.48	0.23	0.67	-2.49	-2.25	-0.07	1.28	-2.56
North America	0.27	-0.96	-0.06	-0.75	-1.56	-4.51	-0.20	1.32	-4.47
Latin America	0.07	-0.68	-0.02	-0.62	-1.99	-2.75	-0.08	1.12	-3.07
MENA	-0.02	-0.37	0.00	-0.39	-2.18	-1.71	-0.07	0.92	-2.48
SSA	-0.04	-0.30	0.01	-0.33	-2.16	-1.62	-0.05	0.92	-2.36
Rest of the World	-0.09	-0.21	0.00	-0.29	-2.26	-1.19	-0.04	0.75	-2.27

Portugal exports of textiles and clothing to different regions, % change

	Modest scenario				Ambitious scenario				
	Tariffs	NTBs: Goods	NTBs: Services	**Total**	Tariffs	NTBs: Goods	NTBs: Services	Spillovers	**Total**
EU26	0.32	0.57	0.03	0.92	7.15	6.42	0.07	-2.01	10.32
Spain	0.42	0.53	0.01	0.96	7.44	5.53	0.00	-2.15	9.41
USA	107.14	56.18	-0.03	163.29	126.36	61.69	0.10	-2.57	182.74
Oceania	0.47	0.14	0.01	0.61	8.45	5.15	0.02	-0.77	12.03
East Asia	0.42	-0.05	0.00	0.36	8.65	4.42	-0.01	-0.62	11.23
South East Asia	0.22	-0.14	0.00	0.09	8.49	4.69	0.00	-0.58	11.79
South Asia	0.27	0.98	0.24	1.49	7.95	4.73	0.01	-0.38	11.73
North America	0.43	-0.35	0.00	0.08	8.70	4.19	0.03	-0.66	11.85
Latin America	0.41	-0.12	0.00	0.28	8.51	4.91	0.02	-0.52	12.16
MENA	0.34	0.31	0.02	0.68	8.19	5.32	0.02	-0.78	11.86
SSA	0.38	0.18	0.02	0.58	8.23	5.07	0.02	-0.60	11.84
Rest of the World	0.40	0.36	0.01	0.77	8.24	5.51	0.03	-0.94	11.84

Long-run results assuming full employment for Portugal

The results presented in this section are based on the same assumptions as the long-run scenario discussed in the main text, except here full employment in the economy is assumed.

Macro Impacts on Portugal

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs Goods	NTBs Service	**Total**	Tariffs	NTBs Goods	NTBs Service	Spillovers	**Total**
GDP, %	0.07	0.06	0.01	**0.14**	0.07	0.12	0.01	0.05	**0.25**
National Income,	223.04	164.02	6.98	**394.03**	223.31	285.53	15.73	60.93	**561.15**
Consumer Prices,	0.00	0.06	0.00	**0.06**	-0.01	0.10	0.00	-0.12	**-0.05**
Exports, %	0.55	0.48	0.04	**1.06**	0.54	0.80	0.07	-0.03	**1.37**
Imports, %	0.49	0.43	0.03	**0.95**	0.49	0.72	0.07	-0.03	**1.23**
Terms of Trade, %	0.07	0.06	0.00	**0.13**	0.07	0.09	0.01	-0.03	**0.12**
low skill wages, %	0.58	0.30	0.00	**0.89**	0.58	0.33	0.01	-0.01	**0.88**
medium skill wage	0.18	0.13	0.00	**0.32**	0.19	0.22	0.01	0.07	**0.49**
high skill wages, %	0.23	0.15	0.01	**0.38**	0.23	0.23	0.02	0.06	**0.54**

Change in Low Skilled Employment by Sector, %

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs Goods	NTBs Service	**Total**	Tariffs	NTBs Goods	NTBs Service	Spillovers	**Total**
Primary	-0.42	-0.35	0.01	**-0.77**	-0.43	-0.55	0.01	-0.16	**-1.12**
Processed Food	-0.58	-0.15	0.00	**-0.73**	-0.57	0.01	0.01	-0.03	**-0.56**
Energy	-0.37	-0.52	0.01	**-0.88**	-0.36	-0.64	0.02	0.18	**-0.72**
Chemicals	-3.11	-2.89	-0.05	**-6.04**	-3.11	-4.33	-0.09	-0.38	**-7.99**
Electric Machinery	-10.32	-3.38	-0.13	**-13.83**	-9.64	-1.35	-0.29	0.07	**-12.62**
Vehicles	-2.24	0.13	0.00	**-2.10**	-2.37	1.31	0.00	-0.42	**-1.59**
Other Transport E	-1.57	-0.90	0.00	**-2.48**	-1.53	-1.17	0.01	0.10	**-2.58**
Metals	-2.01	-1.12	0.00	**-3.13**	-1.98	-1.24	0.00	0.13	**-3.08**
Wood, Paper, Pub	-1.04	-0.33	0.00	**-1.36**	-1.00	-0.01	0.01	0.11	**-0.84**
Textiles and Appa	10.30	5.37	-0.02	**15.65**	10.15	5.14	-0.03	0.00	**15.19**
Other Manufactur	-1.78	-0.74	0.01	**-2.51**	-1.75	-0.40	0.02	0.10	**-2.01**
Air transport	-0.74	-0.35	0.07	**-1.03**	-0.72	-0.17	0.13	0.23	**-0.39**
Water transport	-0.74	-0.35	0.01	**-1.08**	-0.72	-0.23	0.01	0.24	**-0.54**
Other Transport	-0.78	-0.36	0.07	**-1.07**	-0.78	-0.26	0.12	0.16	**-0.66**
Finance	-0.52	-0.24	0.01	**-0.75**	-0.52	-0.18	0.02	0.06	**-0.58**
Insurance	-0.46	-0.20	0.07	**-0.59**	-0.45	-0.11	0.15	0.10	**-0.27**
Business, Professi	-0.63	-0.30	0.00	**-0.93**	-0.62	-0.26	0.01	0.06	**-0.78**
Communications	-0.64	-0.29	-0.01	**-0.93**	-0.63	-0.21	-0.02	0.07	**-0.75**
Construction	-0.32	-0.14	0.01	**-0.45**	-0.31	-0.06	0.01	0.07	**-0.27**
Personal Services	-0.71	-0.33	-0.06	**-1.10**	-0.70	-0.23	-0.13	0.12	**-0.86**
Other Services	-0.55	-0.23	0.01	**-0.77**	-0.54	-0.13	0.02	0.10	**-0.51**

Change in Medium Skilled Employment by Sector, %

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs Goods	NTBs Service	**Total**	Tariffs	NTBs Goods	NTBs Service	Spillovers	**Total**
Primary	-0.30	-0.30	0.00	**-0.59**	-0.30	-0.52	0.01	-0.19	**-1.00**
Processed Food	-0.17	0.03	0.00	**-0.14**	-0.17	0.12	0.01	-0.10	**-0.16**
Energy	-0.13	-0.41	0.01	**-0.54**	-0.12	-0.58	0.02	0.13	**-0.49**
Chemicals	-2.67	-2.70	-0.05	**-5.42**	-2.68	-4.22	-0.09	-0.47	**-7.57**
Electric Machinery	-9.93	-3.21	-0.13	**-13.26**	-9.23	-1.24	-0.30	-0.01	**-12.22**
Vehicles	-1.79	0.33	0.00	**-1.46**	-1.93	1.44	0.00	-0.51	**-1.14**
Other Transport E	-1.12	-0.71	0.00	**-1.83**	-1.09	-1.05	0.01	0.02	**-2.14**
Metals	-1.56	-0.92	0.00	**-2.49**	-1.54	-1.13	0.00	0.05	**-2.65**
Wood, Paper, Pub	-0.59	-0.13	0.00	**-0.71**	-0.55	0.11	0.01	0.02	**-0.40**
Textiles and Appa	10.83	5.60	-0.02	**16.41**	10.66	5.28	-0.04	-0.09	**15.70**
Other Manufactur	-1.33	-0.54	0.01	**-1.87**	-1.31	-0.28	0.02	0.01	**-1.57**
Air transport	-0.14	-0.10	0.06	**-0.18**	-0.14	-0.01	0.13	0.12	**0.19**
Water transport	-0.15	-0.09	0.00	**-0.23**	-0.13	-0.07	0.01	0.13	**0.04**
Other Transport	-0.19	-0.11	0.07	**-0.22**	-0.19	-0.10	0.12	0.05	**-0.08**
Finance	-0.06	-0.04	0.01	**-0.09**	-0.06	-0.06	0.02	-0.02	**-0.13**
Insurance	-0.01	0.00	0.07	**0.07**	0.00	0.02	0.15	0.01	**0.18**
Business, Professi	-0.17	-0.11	0.00	**-0.28**	-0.17	-0.14	0.01	-0.03	**-0.34**
Communications	-0.18	-0.09	-0.01	**-0.28**	-0.18	-0.09	-0.02	-0.02	**-0.30**
Construction	0.19	0.08	0.01	**0.27**	0.19	0.07	0.01	-0.03	**0.23**
Personal Services	-0.25	-0.13	-0.06	**-0.45**	-0.25	-0.11	-0.13	0.04	**-0.41**
Other Services	-0.05	-0.01	0.01	**-0.05**	-0.05	0.00	0.02	0.01	**-0.02**

Change in High Skilled Employment by Sector, %

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers	**Total**
Primary	-0.31	-0.30	0.00	**-0.61**	-0.32	-0.52	0.01	-0.18	**-1.01**
Processed Food	-0.21	0.01	0.00	**-0.21**	-0.21	0.11	-0.01	-0.09	**-0.21**
Energy	-0.16	-0.43	0.01	**-0.58**	-0.14	-0.58	0.01	0.14	**-0.52**
Chemicals	-2.72	-2.72	-0.05	**-5.49**	-2.72	-4.23	-0.10	-0.46	**-7.63**
Electric Machinery	-9.97	-3.23	-0.13	**-13.33**	-9.27	-1.25	-0.31	0.00	**-12.28**
Vehicles	-1.83	0.30	-0.01	**-1.53**	-1.97	1.42	-0.01	-0.50	**-1.20**
Other Transport E	-1.17	-0.73	-0.01	**-1.91**	-1.13	-1.07	-0.01	0.03	**-2.20**
Metals	-1.61	-0.95	-0.01	**-2.57**	-1.58	-1.14	-0.02	0.06	**-2.71**
Wood, Paper, Pub	-0.63	-0.15	0.00	**-0.79**	-0.60	0.10	-0.01	0.03	**-0.46**
Textiles and Appa	10.77	5.57	-0.02	**16.32**	10.60	5.27	-0.05	-0.08	**15.63**
Other Manufactur	-1.38	-0.56	0.00	**-1.94**	-1.35	-0.29	0.00	0.02	**-1.62**
Air Transport	-0.20	-0.13	0.05	**-0.28**	-0.20	-0.03	0.11	0.13	**0.12**
Water Transport	-0.21	-0.12	-0.01	**-0.33**	-0.19	-0.09	-0.01	0.14	**-0.04**
Other Transport	-0.25	-0.14	0.06	**-0.33**	-0.25	-0.12	0.10	0.06	**-0.16**
Finance	-0.11	-0.06	0.00	**-0.17**	-0.11	-0.07	0.01	-0.01	**-0.19**
Insurance	-0.05	-0.02	0.07	**-0.01**	-0.05	0.00	0.13	0.03	**0.12**
Business, Professi	-0.22	-0.13	0.00	**-0.35**	-0.22	-0.15	-0.01	-0.02	**-0.40**
Communications	-0.22	-0.11	-0.02	**-0.35**	-0.22	-0.10	-0.03	-0.01	**-0.36**
Construction	0.13	0.05	0.00	**0.19**	0.14	0.06	0.00	-0.01	**0.16**
Personal Services	-0.30	-0.16	-0.07	**-0.53**	-0.29	-0.12	-0.15	0.05	**-0.47**
Other Services	-0.10	-0.04	0.00	**-0.14**	-0.10	-0.01	0.00	0.02	**-0.08**

Change in Output by Sector, %

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers	**Total**
Primary	-0.29	-0.26	0.00	**-0.55**	-0.29	-0.44	0.01	-0.15	**-0.86**
Processed Food	-0.17	0.06	0.00	**-0.10**	-0.16	0.23	0.01	-0.05	**0.03**
Energy	-0.09	-0.38	0.01	**-0.46**	-0.07	-0.50	0.02	0.17	**-0.32**
Chemicals	-2.80	-2.79	-0.05	**-5.64**	-2.81	-4.29	-0.09	-0.42	**-7.72**
Electric Machinery	-10.32	-3.31	-0.13	**-13.76**	-9.60	-1.19	-0.31	0.05	**-12.54**
Vehicles	-1.86	0.38	0.00	**-1.47**	-2.00	1.62	0.00	-0.47	**-0.98**
Other Transport E	-1.25	-0.75	0.00	**-2.01**	-1.21	-1.04	0.00	0.08	**-2.18**
Metals	-1.68	-0.96	0.00	**-2.64**	-1.65	-1.10	0.00	0.11	**-2.66**
Wood, Paper, Pub	-0.63	-0.11	0.00	**-0.73**	-0.59	0.22	0.01	0.09	**-0.24**
Textiles and Appa	11.02	5.73	-0.02	**16.73**	10.85	5.48	-0.04	-0.03	**16.17**
Other Manufactur	-1.45	-0.57	0.01	**-2.02**	-1.42	-0.23	0.02	0.07	**-1.56**
Air Transport	-0.19	-0.12	0.06	**-0.25**	-0.18	-0.01	0.12	0.14	**0.16**
Water Transport	0.00	0.02	0.00	**0.02**	0.01	0.13	0.01	0.21	**0.49**
Other Transport	-0.13	-0.05	0.07	**-0.11**	-0.13	0.01	0.12	0.10	**0.16**
Finance	0.05	0.05	0.01	**0.11**	0.06	0.09	0.03	0.03	**0.20**
Insurance	0.01	0.02	0.07	**0.10**	0.02	0.06	0.15	0.04	**0.27**
Business, Professi	-0.04	-0.01	0.00	**-0.04**	-0.03	0.04	0.01	0.03	**0.05**
Communications	-0.07	0.00	-0.01	**-0.08**	-0.06	0.07	-0.02	0.04	**0.03**
Construction	0.07	0.06	0.01	**0.14**	0.08	0.13	0.01	0.05	**0.28**
Personal Services	-0.23	-0.11	-0.07	**-0.41**	-0.22	-0.05	-0.13	0.07	**-0.29**
Other Services	-0.02	0.02	0.00	**0.00**	-0.02	0.07	0.01	0.04	**0.10**

Change in Exports by Sector, %

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers	**Total**
Primary	-0.59	0.35	0.00	**-0.24**	-0.57	1.36	0.01	0.10	**1.02**
Processed Food	-0.07	0.45	0.00	**0.39**	-0.04	1.14	0.01	0.12	**1.27**
Energy	4.64	-0.49	0.00	**4.15**	4.71	-0.63	0.00	0.47	**4.66**
Chemicals	-3.99	-3.94	-0.06	**-7.99**	-3.94	-5.93	-0.11	-0.50	**-10.63**
Electric Machinery	-12.22	-4.29	-0.17	**-16.67**	-11.36	-2.04	-0.38	0.19	**-15.27**
Vehicles	-2.03	0.83	0.00	**-1.20**	-2.20	2.72	0.00	-0.43	**-0.06**
Other Transport E	-1.25	-0.04	0.00	**-1.29**	-1.21	0.58	0.01	0.21	**-0.35**
Metals	-1.82	-1.13	0.00	**-2.96**	-1.78	-1.39	0.00	0.38	**-2.73**
Wood, Paper, Pub	-0.77	0.18	0.01	**-0.58**	-0.70	0.99	0.02	0.25	**0.61**
Textiles and Appa	19.04	10.01	-0.02	**29.04**	18.71	9.68	-0.03	-0.22	**27.92**
Other Manufactur	-2.06	-1.01	0.01	**-3.06**	-2.01	-0.50	0.03	0.27	**-2.13**
Air Transport	-0.20	-0.12	0.09	**-0.23**	-0.19	-0.01	0.18	0.16	**0.25**
Water Transport	0.01	0.03	0.01	**0.05**	0.03	0.15	0.02	0.24	**0.59**
Other Transport	-0.23	-0.09	0.22	**-0.09**	-0.24	0.02	0.45	0.24	**0.61**
Finance	-0.09	0.04	0.39	**0.34**	-0.07	0.20	0.80	0.10	**1.06**
Insurance	-0.28	-0.11	0.84	**0.45**	-0.25	0.01	1.71	0.15	**1.68**
Business, Professi	-0.35	-0.10	0.05	**-0.40**	-0.36	0.16	0.12	0.14	**0.22**
Communications	-0.26	-0.04	0.04	**-0.26**	-0.24	0.16	0.09	0.13	**0.21**
Construction	-0.92	-0.51	0.02	**-1.42**	-0.90	-0.46	0.04	0.31	**-0.85**
Personal Services	-0.99	-0.46	0.20	**-1.25**	-0.98	-0.22	0.41	0.25	**-0.27**
Other Services	-0.36	-0.08	0.01	**-0.44**	-0.34	0.14	0.02	0.21	**0.12**

Change in Imports by Sector, %

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers	**Total**
Primary	1.10	1.32	0.00	**2.42**	1.15	2.54	-0.01	0.42	**4.15**
Processed Food	0.58	0.22	0.00	**0.80**	0.60	0.32	0.01	0.12	**1.05**
Energy	0.23	-0.12	0.02	**0.13**	0.23	-0.16	0.04	-0.08	**0.00**
Chemicals	1.69	1.48	0.02	**3.20**	1.72	2.25	0.05	0.20	**4.23**
Electric Machinery	2.46	0.61	0.03	**3.11**	2.31	0.02	0.07	0.00	**2.78**
Vehicles	0.06	0.31	0.00	**0.38**	0.07	0.71	0.01	0.00	**0.77**
Other Transport E	0.68	0.58	0.02	**1.28**	0.67	1.06	0.04	0.00	**1.78**
Metals	-0.14	0.08	0.00	**-0.06**	-0.13	0.31	0.01	0.02	**0.18**
Wood, Paper, Pub	0.53	0.52	0.00	**1.05**	0.53	0.84	0.01	0.12	**1.49**
Textiles and Appa	-2.19	-0.99	0.02	**-3.16**	-2.19	-0.73	0.06	-0.34	**-3.37**
Other Manufactur	1.16	0.43	0.00	**1.58**	1.15	0.33	0.00	0.09	**1.57**
Air Transport	0.09	0.09	0.04	**0.21**	0.08	0.13	0.07	0.00	**0.27**
Water Transport	0.09	0.08	0.02	**0.18**	0.11	0.15	0.03	0.15	**0.52**
Other Transport	0.23	0.19	0.15	**0.57**	0.23	0.22	0.50	0.02	**0.96**
Finance	0.20	0.06	0.17	**0.42**	0.19	-0.02	0.33	0.00	**0.49**
Insurance	0.38	0.21	0.37	**0.96**	0.37	0.19	0.75	0.01	**1.30**
Business, Professi	0.36	0.23	0.06	**0.65**	0.35	0.24	0.12	-0.02	**0.64**
Communications	0.28	0.15	0.17	**0.60**	0.28	0.11	0.34	0.07	**0.76**
Construction	1.03	0.57	0.02	**1.61**	1.00	0.58	0.03	-0.03	**1.50**
Personal Services	0.89	0.61	0.69	**2.19**	0.85	0.70	1.42	-0.05	**2.86**
Other Services	0.37	0.22	0.00	**0.59**	0.35	0.19	0.00	-0.14	**0.32**

Change in Portugal's exports to the US by Sector, %

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers	**Total**
Primary	3.89	54.80	0.02	**58.71**	5.02	133.08	0.05	-1.43	**135.46**
Processed Food	6.41	17.74	0.01	**24.16**	6.98	37.27	0.03	-0.39	**43.47**
Energy	17.46	-0.57	-0.02	**16.88**	17.57	-0.78	-0.01	0.34	**17.09**
Chemicals	5.80	10.38	-0.09	**16.10**	6.09	23.32	-0.17	-0.91	**27.58**
Electric Machinery	-5.59	13.55	-0.39	**7.57**	-5.15	38.04	-0.86	-0.28	**29.00**
Vehicles	16.53	63.52	-0.02	**80.03**	21.37	155.44	-0.04	-3.65	**170.10**
Other Transport E	1.06	11.99	0.01	**13.06**	1.23	25.65	0.04	-0.09	**26.39**
Metals	21.97	22.29	0.05	**44.31**	24.73	49.82	0.09	-0.54	**73.26**
Wood, Paper, Pub	0.20	9.60	0.02	**9.83**	0.45	20.62	0.05	-0.01	**20.68**
Textiles and Appa	147.19	77.91	-0.03	**225.07**	143.94	68.71	-0.09	-0.14	**211.50**
Other Manufactur	13.84	-1.05	0.02	**12.81**	14.10	-0.55	0.06	0.13	**13.26**
Air Transport	-0.06	-0.05	0.82	**0.71**	0.00	0.05	1.65	0.06	**1.65**
Water Transport	0.07	0.05	3.60	**3.71**	0.14	0.21	7.31	0.05	**7.42**
Other Transport	0.05	-0.08	3.53	**3.49**	0.12	0.01	7.19	-0.01	**7.06**
Finance	0.08	0.16	4.39	**4.63**	0.16	0.37	8.89	0.02	**9.28**
Insurance	-0.03	0.07	4.54	**4.57**	0.06	0.28	9.22	-0.01	**9.35**
Business, Professi	0.10	0.07	1.24	**1.41**	0.20	0.31	2.50	0.08	**2.89**
Communications	-0.05	-0.06	0.76	**0.65**	0.04	0.05	1.53	0.07	**1.52**
Construction	-0.41	-0.24	1.77	**1.12**	-0.29	0.04	3.57	0.10	**3.16**
Personal Services	-0.30	-0.29	2.61	**2.02**	-0.06	-0.31	5.27	-0.16	**4.09**
Other Services	-0.13	0.21	0.02	**0.10**	0.01	0.50	0.04	0.00	**0.25**

Change in Portugal's exports to the EU by Sector, %

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers	**Total**
Primary	-0.59	-0.11	0.01	**-0.69**	-0.57	0.11	0.02	-0.53	**-1.01**
Processed Food	-0.23	0.20	0.01	**-0.02**	-0.21	0.58	0.02	-0.05	**0.33**
Energy	-0.36	-0.07	0.01	**-0.42**	-0.32	0.30	0.03	0.44	**0.59**
Chemicals	-4.71	-5.15	-0.05	**-9.91**	-4.66	-8.42	-0.10	-0.57	**-13.91**
Electric Machinery	-12.35	-4.71	-0.16	**-17.22**	-11.39	-3.21	-0.37	-0.30	**-17.21**
Vehicles	-3.42	-1.34	0.01	**-4.76**	-3.93	-2.63	0.02	-0.67	**-7.36**
Other Transport E	-1.81	-1.42	0.01	**-3.22**	-1.77	-2.33	0.02	0.08	**-4.02**
Metals	-2.29	-1.46	-0.01	**-3.75**	-2.27	-2.08	-0.01	0.16	**-4.31**
Wood, Paper, Pub	-0.69	-0.11	0.01	**-0.79**	-0.62	0.37	0.02	0.04	**-0.17**
Textiles and Appa	11.89	6.52	0.00	**18.42**	11.79	7.26	0.01	-0.28	**18.62**
Other Manufactur	-2.61	-0.49	0.02	**-3.08**	-2.55	0.51	0.05	-0.07	**-2.15**
Air Transport	-0.15	0.08	-0.04	**-0.11**	-0.13	0.36	-0.09	0.06	**0.21**
Water Transport	-0.12	0.10	-0.01	**-0.03**	-0.10	0.41	-0.03	0.12	**0.47**
Other Transport	-0.16	0.13	-0.03	**-0.05**	-0.14	0.49	-0.13	0.07	**0.33**
Finance	0.00	0.21	-0.05	**0.16**	0.02	0.54	-0.10	0.05	**0.51**
Insurance	-0.18	0.21	0.00	**0.03**	-0.15	0.63	0.00	0.03	**0.51**
Business, Professi	-0.26	0.11	-0.01	**-0.16**	-0.24	0.45	-0.01	0.02	**0.21**
Communications	-0.14	0.22	-0.02	**0.06**	-0.11	0.65	-0.04	0.05	**0.54**
Construction	-0.66	0.02	0.01	**-0.63**	-0.62	0.57	0.02	0.06	**0.04**
Personal Services	-0.71	0.24	-0.01	**-0.48**	-0.66	1.02	-0.01	-0.04	**0.28**
Other Services	-0.19	0.30	0.02	**0.13**	-0.15	0.87	0.04	0.09	**0.85**

Change in Portugal's value-added by sector, %

	Modest scenario				Ambitious scenario				
	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers	**Total**
Primary	-0.29	-0.26	0.00	**-0.55**	-0.29	-0.44	0.01	-0.15	**-0.86**
Processed Food	-0.17	0.06	0.00	**-0.10**	-0.16	0.23	0.01	-0.05	**0.03**
Energy	-0.09	-0.38	0.01	**-0.46**	-0.07	-0.50	0.02	0.17	**-0.32**
Chemicals	-2.80	-2.79	-0.05	**-5.64**	-2.81	-4.29	-0.09	-0.42	**-7.72**
Electric Machinery	-10.32	-3.31	-0.13	**-13.76**	-9.60	-1.19	-0.31	0.05	**-12.54**
Vehicles	-1.86	0.38	0.00	**-1.47**	-2.00	1.62	0.00	-0.47	**-0.98**
Other Transport E	-1.25	-0.75	0.00	**-2.01**	-1.21	-1.04	0.00	0.08	**-2.18**
Metals	-1.68	-0.96	0.00	**-2.64**	-1.65	-1.10	0.00	0.11	**-2.66**
Wood, Paper, Pub	-0.63	-0.11	0.00	**-0.73**	-0.59	0.22	0.01	0.09	**-0.24**
Textiles and Appa	11.02	5.73	-0.02	**16.73**	10.85	5.48	-0.04	-0.03	**16.17**
Other Manufactur	-1.45	-0.57	0.01	**-2.02**	-1.42	-0.23	0.02	0.07	**-1.56**
Air transport	-0.19	-0.12	0.06	**-0.25**	-0.18	-0.01	0.12	0.14	**0.16**
Water transport	0.00	0.02	0.00	**0.02**	0.01	0.13	0.01	0.21	**0.49**
Other Transport	-0.13	-0.05	0.07	**-0.11**	-0.13	0.01	0.12	0.10	**0.16**
Finance	0.05	0.05	0.01	**0.11**	0.06	0.09	0.03	0.03	**0.20**
Insurance	0.01	0.02	0.07	**0.10**	0.02	0.06	0.15	0.04	**0.27**
Business, Professi	-0.04	-0.01	0.00	**-0.04**	-0.03	0.04	0.01	0.03	**0.05**
Communications	-0.07	0.00	-0.01	**-0.08**	-0.06	0.07	-0.02	0.04	**0.03**
Construction	0.07	0.06	0.01	**0.14**	0.08	0.13	0.01	0.05	**0.28**
Personal Services	-0.23	-0.11	-0.07	**-0.41**	-0.22	-0.05	-0.13	0.07	**-0.29**
Other Services	-0.02	0.02	0.00	**0.00**	-0.02	0.07	0.01	0.04	**0.10**

Portugal exports of electric machinery to different regions, % change

	Modest scenario				Ambitious scenario				
	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers	**Total**
EU26	-12.35	-4.71	-0.16	-17.22	-11.39	-3.21	-0.37	-0.30	-17.21
Spain	-12.80	-4.46	-0.14	-17.40	-12.12	-1.97	-0.31	-0.28	-16.06
USA	-5.59	13.55	-0.39	7.57	-5.15	38.04	-0.86	-0.28	29.00
Oceania	-11.88	-5.20	-0.21	-17.28	-10.72	-4.87	-0.50	1.42	-16.86
East Asia	-12.20	-5.10	-0.19	-17.49	-11.19	-4.27	-0.44	1.35	-16.34
South East Asia	-12.15	-5.47	-0.22	-17.84	-11.28	-4.48	-0.48	1.32	-16.24
South Asia	-12.55	-4.75	-0.15	-17.44	-11.89	-2.61	-0.33	1.18	-14.46
North America	-11.78	-6.17	-0.27	-18.21	-10.89	-5.82	-0.56	1.20	-17.38
Latin America	-12.17	-4.92	-0.17	-17.26	-11.41	-3.21	-0.38	1.07	-15.05
MENA	-12.51	-4.79	-0.16	-17.47	-11.78	-2.94	-0.37	1.18	-15.13
SSA	-12.36	-4.78	-0.16	-17.31	-11.64	-3.05	-0.35	1.26	-15.00
Rest of the World	-12.64	-4.64	-0.14	-17.42	-11.98	-2.54	-0.33	1.02	-15.03

Portugal exports of textiles and clothing to different regions, % change

	Modest scenario				Ambitious scenario				
	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers	**Total**
EU26	11.89	6.52	0.00	18.42	11.79	7.26	0.01	-0.28	18.62
Spain	12.80	6.37	-0.04	19.13	12.43	5.81	-0.07	-0.71	17.22
USA	147.19	77.91	-0.03	225.07	143.94	68.71	-0.09	-0.14	211.50
Oceania	13.96	6.97	-0.04	20.89	13.82	6.59	-0.06	0.58	21.18
East Asia	14.56	6.30	-0.10	20.75	14.51	3.84	-0.23	1.14	18.17
South East Asia	12.72	8.25	0.09	21.07	11.72	13.24	0.37	-0.96	27.30
South Asia	13.69	6.83	-0.04	20.49	13.52	6.26	-0.07	0.60	20.32
North America	14.16	6.61	-0.06	20.70	13.99	5.58	-0.11	1.02	20.33
Latin America	14.07	6.91	-0.05	20.94	13.96	6.24	-0.08	0.82	20.96
MENA	14.18	7.07	-0.05	21.20	13.93	6.22	-0.09	0.16	19.84
SSA	13.69	6.77	-0.04	20.43	13.54	5.97	-0.07	0.83	20.26
Rest of the World	14.34	6.97	-0.04	21.27	14.07	5.78	-0.07	0.17	19.71

Long-run results assuming some structural unemployment remaining for Portugal

The results presented here were discussed in detail in the main text of this report.

Macro Impacts on Portugal

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs Goods	NTBs Service	**Total**	Tariffs	NTBs Goods	NTBs Service	Spillovers	**Total**
GDP, %	0.35	0.22	0.01	**0.57**	0.35	0.33	0.02	0.07	**0.76**
National Income, million	775.52	487.25	14.00	**1276.74**	778.41	717.92	31.62	117.79	**1610.14**
Consumer Prices, %	0.01	0.06	0.00	**0.08**	0.00	0.10	0.00	-0.12	**-0.04**
Exports, %	0.73	0.58	0.04	**1.35**	0.72	0.94	0.08	-0.01	**1.70**
Imports, %	0.65	0.52	0.03	**1.20**	0.64	0.84	0.07	-0.01	**1.52**
Terms of Trade, %	0.04	0.04	0.00	**0.09**	0.04	0.07	0.01	-0.03	**0.07**
low skill wages, %	0.58	0.31	0.00	**0.89**	0.58	0.36	0.01	0.01	**0.94**
medium skill wages, %	0.31	0.19	0.00	**0.51**	0.31	0.29	0.01	0.06	**0.68**
high skill wages, %	0.36	0.22	0.01	**0.60**	0.37	0.32	0.02	0.06	**0.77**

Long run, with unemployment
Change in Low Skilled Employment by Sector, %

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs Goods	NTBs Service	**Total**	Tariffs	NTBs Goods	NTBs Service	Spillovers	**Total**
Primary	-0.32	-0.30	0.01	**-0.61**	-0.33	-0.49	0.02	-0.16	**-0.96**
Proccessd Food	-0.40	-0.06	0.00	**-0.45**	-0.39	0.11	0.01	-0.03	**-0.29**
Energy	-0.15	-0.39	0.01	**-0.52**	-0.13	-0.48	0.03	0.19	**-0.33**
Chemicals	-2.14	-2.34	-0.06	**-4.53**	-2.14	-3.64	-0.11	-0.35	**-6.35**
Electric Machinery	-9.29	-2.73	-0.09	**-12.12**	-8.60	-0.39	-0.22	0.26	**-10.40**
Vehicles	-2.09	0.20	0.00	**-1.89**	-2.23	1.39	0.01	-0.42	**-1.37**
Other Transport Equipm	-1.49	-0.87	0.00	**-2.36**	-1.45	-1.15	0.01	0.10	**-2.49**
Metals	-1.90	-1.07	0.00	**-2.97**	-1.87	-1.20	0.00	0.13	**-2.94**
Wood, Paper, Publishing	-0.91	-0.26	0.01	**-1.17**	-0.87	0.05	0.01	0.11	**-0.66**
Textiles and Apparel	11.21	5.85	-0.01	**17.04**	11.05	5.68	-0.02	0.01	**16.61**
Other Manufacturing	-1.43	-0.54	0.01	**-1.96**	-1.40	-0.16	0.03	0.11	**-1.41**
Airtransport	-0.60	-0.29	0.07	**-0.83**	-0.59	-0.13	0.13	0.21	**-0.24**
Watertransport	-0.62	-0.30	0.00	**-0.92**	-0.61	-0.21	0.01	0.22	**-0.44**
Other Transport	-0.54	-0.25	0.07	**-0.72**	-0.54	-0.15	0.12	0.15	**-0.33**
Finance	-0.23	-0.08	0.01	**-0.30**	-0.22	-0.01	0.03	0.06	**-0.12**
Insurance	-0.15	-0.03	0.08	**-0.11**	-0.14	0.08	0.15	0.10	**0.22**
Business, Professional,	-0.40	-0.18	0.00	**-0.58**	-0.39	-0.13	0.01	0.05	**-0.44**
Communications	-0.39	-0.16	-0.01	**-0.56**	-0.38	-0.07	-0.02	0.07	**-0.37**
Construction	-0.02	0.02	0.01	**0.01**	-0.02	0.13	0.02	0.08	**0.22**
Personal Services	-0.51	-0.23	-0.06	**-0.80**	-0.50	-0.11	-0.13	0.12	**-0.55**
Other Services	-0.21	-0.05	0.01	**-0.25**	-0.20	0.07	0.02	0.10	**0.02**

Long run, with unemployment
Change in Medium Skilled Employment by Sector, %

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs Goods	NTBs Service	**Total**	Tariffs	NTBs Goods	NTBs Service	Spillovers	**Total**
Primary	-0.24	-0.26	0.01	**-0.50**	-0.25	-0.47	0.02	-0.18	**-0.88**
Proccessd Food	-0.13	0.06	0.00	**-0.07**	-0.13	0.18	0.01	-0.08	**-0.03**
Energy	0.01	-0.32	0.01	**-0.30**	0.02	-0.44	0.03	0.16	**-0.18**
Chemicals	-1.85	-2.22	-0.06	**-4.13**	-1.86	-3.57	-0.11	-0.41	**-6.08**
Electric Machinery	-9.03	-2.62	-0.09	**-11.74**	-8.33	-0.32	-0.23	0.21	**-10.14**
Vehicles	-1.80	0.33	0.00	**-1.47**	-1.94	1.46	0.01	-0.48	**-1.09**
Other Transport Equipm	-1.20	-0.74	0.00	**-1.94**	-1.16	-1.08	0.01	0.04	**-2.21**
Metals	-1.61	-0.94	0.00	**-2.56**	-1.59	-1.13	0.00	0.07	**-2.66**
Wood, Paper, Publishing	-0.62	-0.13	0.01	**-0.74**	-0.58	0.13	0.01	0.05	**-0.37**
Textiles and Apparel	11.55	6.00	-0.01	**17.54**	11.38	5.77	-0.02	-0.06	**16.94**
Other Manufacturing	-1.14	-0.42	0.01	**-1.54**	-1.11	-0.09	0.03	0.05	**-1.13**
Airtransport	-0.22	-0.13	0.06	**-0.28**	-0.21	-0.03	0.13	0.14	**0.13**
Watertransport	-0.24	-0.13	0.00	**-0.37**	-0.23	-0.11	0.01	0.14	**-0.07**
Other Transport	-0.16	-0.08	0.07	**-0.17**	-0.16	-0.05	0.12	0.07	**0.03**
Finance	0.07	0.04	0.01	**0.13**	0.07	0.07	0.03	0.00	**0.16**
Insurance	0.15	0.10	0.07	**0.32**	0.15	0.16	0.15	0.04	**0.51**
Business, Professional,	-0.10	-0.06	0.00	**-0.16**	-0.10	-0.06	0.01	-0.01	**-0.16**
Communications	-0.10	-0.03	-0.01	**-0.14**	-0.09	0.00	-0.02	0.01	**-0.09**
Construction	0.31	0.16	0.01	**0.48**	0.31	0.21	0.02	0.01	**0.54**
Personal Services	-0.22	-0.10	-0.06	**-0.38**	-0.21	-0.04	-0.13	0.07	**-0.27**
Other Services	0.12	0.09	0.01	**0.22**	0.12	0.15	0.02	0.04	**0.33**

Long-run, with unemployment
Change in High-Skilled Employment by Sector, %

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs: Goods	NTBs: Services	**Total**	Tariffs	NTBs: Goods	NTBs: Services	Spillovers	**Total**
Primary	-0.26	-0.27	0.01	**-0.53**	-0.27	-0.48	0.01	-0.17	**-0.91**
Processed Food	-0.19	0.02	0.00	**-0.17**	-0.19	0.14	0.00	-0.08	**-0.13**
Energy	-0.03	-0.34	0.01	**-0.36**	-0.01	-0.46	0.02	0.16	**-0.24**
Chemicals	-1.91	-2.25	-0.06	**-4.23**	-1.92	-3.60	-0.12	-0.41	**-6.18**
Electrical Machinery	-9.09	-2.65	-0.10	**-11.84**	-8.39	-0.36	-0.24	0.21	**-10.24**
Vehicles	-1.87	0.29	0.00	**-1.57**	-2.00	1.42	0.00	-0.48	**-1.20**
Other Transport Equipm	-1.26	-0.78	0.00	**-2.04**	-1.22	-1.11	0.00	0.04	**-2.31**
Metals	-1.67	-0.98	-0.01	**-2.66**	-1.65	-1.16	-0.01	0.07	**-2.76**
Wood, Paper, Publishing	-0.68	-0.17	0.00	**-0.85**	-0.65	0.09	0.00	0.05	**-0.48**
Textiles and Apparel	11.48	5.96	-0.02	**17.42**	11.31	5.73	-0.04	-0.05	**16.82**
Other Manufacturing	-1.20	-0.45	0.00	**-1.65**	-1.17	-0.13	0.01	0.06	**-1.24**
Airtransport	-0.30	-0.17	0.06	**-0.42**	-0.29	-0.08	0.12	0.14	**-0.01**
Watertransport	-0.32	-0.18	0.00	**-0.51**	-0.31	-0.16	-0.01	0.15	**-0.21**
Other Transport	-0.24	-0.12	0.06	**-0.30**	-0.24	-0.10	0.11	0.08	**-0.10**
Finance	0.00	0.01	0.01	**0.02**	0.01	0.03	0.02	0.01	**0.06**
Insurance	0.08	0.06	0.07	**0.21**	0.09	0.12	0.14	0.05	**0.40**
Business, Professional, I	-0.17	-0.09	0.00	**-0.26**	-0.17	-0.10	0.00	0.00	**-0.26**
Communications	-0.16	-0.07	-0.01	**-0.24**	-0.15	-0.03	-0.03	0.01	**-0.20**
Construction	0.23	0.13	0.00	**0.36**	0.24	0.17	0.01	0.02	**0.42**
Personal Services	-0.28	-0.14	-0.07	**-0.49**	-0.27	-0.07	-0.14	0.07	**-0.37**
Other Services	0.05	0.05	0.00	**0.10**	0.05	0.11	0.01	0.04	**0.22**

Long-run, with unemployment
Change in Output by Sector, %

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs: Goods	NTBs: Services	**Total**	Tariffs	NTBs: Goods	NTBs: Services	Spillovers	**Total**
Primary	-0.21	-0.22	0.01	**-0.42**	-0.22	-0.39	0.01	-0.14	**-0.72**
Processed Food	-0.03	0.14	0.01	**0.12**	-0.02	0.34	0.01	-0.03	**0.30**
Energy	0.12	-0.26	0.01	**-0.13**	0.14	-0.33	0.03	0.20	**0.08**
Chemicals	-1.85	-2.24	-0.06	**-4.15**	-1.85	-3.57	-0.11	-0.37	**-6.05**
Electrical Machinery	-9.30	-2.65	-0.10	**-12.04**	-8.58	-0.20	-0.23	0.27	**-10.26**
Vehicles	-1.76	0.44	0.01	**-1.32**	-1.91	1.70	0.01	-0.45	**-0.78**
Other Transport Equipm	-1.24	-0.74	0.00	**-1.98**	-1.19	-1.03	0.01	0.08	**-2.14**
Metals	-1.63	-0.93	0.00	**-2.57**	-1.61	-1.06	0.01	0.12	**-2.56**
Wood, Paper, Publishing	-0.55	-0.06	0.01	**-0.60**	-0.51	0.28	0.02	0.10	**-0.08**
Textiles and Apparel	11.88	6.19	-0.01	**18.06**	11.71	6.02	-0.02	-0.01	**17.58**
Other Manufacturing	-1.15	-0.40	0.01	**-1.54**	-1.12	0.01	0.03	0.10	**-0.99**
Airtransport	-0.26	-0.15	0.06	**-0.35**	-0.25	-0.04	0.12	0.15	**0.08**
Watertransport	0.01	0.03	0.01	**0.04**	0.02	0.15	0.01	0.22	**0.53**
Other Transport	-0.03	0.01	0.07	**0.04**	-0.03	0.10	0.13	0.12	**0.36**
Finance	0.27	0.17	0.02	**0.46**	0.28	0.27	0.03	0.05	**0.62**
Insurance	0.19	0.12	0.07	**0.39**	0.20	0.21	0.15	0.06	**0.62**
Business, Professional, I	0.13	0.09	0.01	**0.23**	0.14	0.18	0.01	0.05	**0.38**
Communications	0.11	0.10	-0.01	**0.20**	0.12	0.21	-0.01	0.06	**0.38**
Construction	0.33	0.21	0.01	**0.54**	0.34	0.33	0.02	0.08	**0.76**
Personal Services	-0.15	-0.05	-0.06	**-0.26**	-0.14	0.05	-0.13	0.09	**-0.08**
Other Services	0.18	0.14	0.01	**0.33**	0.19	0.23	0.02	0.06	**0.50**

Long-run, with unemployment
Change in Exports by Sector, %

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs: Goods	NTBs: Services	**Total**	Tariffs	NTBs: Goods	NTBs: Services	Spillovers	**Total**
Primary	-0.74	0.27	0.00	**-0.47**	-0.71	1.24	0.01	0.08	**0.74**
Processed Food	-0.09	0.44	0.01	**0.36**	-0.06	1.13	0.02	0.12	**1.25**
Energy	4.60	-0.51	0.00	**4.09**	4.67	-0.64	0.01	0.49	**4.63**
Chemicals	-2.78	-3.25	-0.07	**-6.10**	-2.74	-5.03	-0.13	-0.43	**-8.51**
Electrical Machinery	-11.12	-3.56	-0.12	**-14.81**	-10.26	-0.93	-0.29	0.45	**-12.74**
Vehicles	-2.01	0.85	0.01	**-1.16**	-2.17	2.74	0.01	-0.41	**0.01**
Other Transport Equipm	-1.37	-0.12	0.01	**-1.48**	-1.33	0.48	0.02	0.21	**-0.56**
Metals	-1.96	-1.21	0.00	**-3.17**	-1.92	-1.49	0.01	0.38	**-2.96**
Wood, Paper, Publishing	-0.85	0.13	0.01	**-0.71**	-0.79	0.93	0.02	0.25	**0.48**
Textiles and Apparel	20.23	10.65	-0.01	**30.87**	19.90	10.40	-0.01	-0.19	**29.85**
Other Manufacturing	-1.77	-0.84	0.02	**-2.59**	-1.71	-0.27	0.05	0.31	**-1.56**
Airtransport	-0.31	-0.18	0.09	**-0.40**	-0.30	-0.07	0.18	0.16	**0.09**
Watertransport	-0.01	0.02	0.01	**0.02**	0.01	0.15	0.02	0.24	**0.56**
Other Transport	-0.32	-0.13	0.23	**-0.23**	-0.33	-0.03	0.45	0.24	**0.48**
Finance	-0.16	0.00	0.39	**0.24**	-0.14	0.18	0.80	0.11	**0.98**
Insurance	-0.45	-0.19	0.84	**0.20**	-0.42	-0.07	1.72	0.16	**1.45**
Business, Professional, I	-0.18	0.01	0.06	**-0.11**	-0.19	0.33	0.13	0.18	**0.62**
Communications	-0.37	-0.10	0.04	**-0.42**	-0.35	0.11	0.09	0.15	**0.08**
Construction	-0.96	-0.54	0.02	**-1.47**	-0.94	-0.49	0.04	0.31	**-0.91**
Personal Services	-1.43	-0.68	0.20	**-1.91**	-1.41	-0.45	0.42	0.28	**-0.90**
Other Services	-0.57	-0.19	0.01	**-0.75**	-0.54	0.02	0.02	0.22	**-0.18**

Long-run, with unemployment
Change in Imports by Sector, %

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs: Goods	NTBs: Services	**Total**	Tariffs	NTBs: Goods	NTBs: Services	Spillovers	**Total**
Primary	1.38	1.49	0.00	**2.87**	1.44	2.77	0.00	0.44	**4.68**
Processed Food	0.79	0.34	0.01	**1.14**	0.81	0.48	0.01	0.14	**1.44**
Energy	0.47	0.02	0.02	**0.52**	0.47	0.03	0.04	-0.06	**0.45**
Chemicals	1.60	1.43	0.04	**3.07**	1.63	2.19	0.07	0.21	**4.12**
Electrical Machinery	2.48	0.61	0.03	**3.11**	2.32	-0.01	0.06	-0.02	**2.73**
Vehicles	0.30	0.45	0.01	**0.75**	0.30	0.90	0.02	0.03	**1.22**
Other Transport Equipm	0.95	0.74	0.02	**1.70**	0.94	1.27	0.04	0.03	**2.29**
Metals	0.14	0.25	0.01	**0.40**	0.16	0.53	0.01	0.05	**0.72**
Wood, Paper, Publishing	0.79	0.67	0.00	**1.47**	0.79	1.04	0.01	0.14	**1.96**
Textiles and Apparel	-2.29	-1.04	0.03	**-3.30**	-2.29	-0.75	0.07	-0.32	**-3.45**
Other Manufacturing	1.28	0.50	0.00	**1.78**	1.27	0.43	0.00	0.11	**1.81**
Airtransport	0.32	0.22	0.04	**0.58**	0.32	0.31	0.08	0.02	**0.70**
Watertransport	0.13	0.10	0.02	**0.24**	0.15	0.18	0.04	0.15	**0.60**
Other Transport	0.53	0.36	0.15	**1.04**	0.53	0.43	0.51	0.04	**1.48**
Finance	0.50	0.23	0.17	**0.90**	0.49	0.20	0.34	0.02	**1.03**
Insurance	0.77	0.42	0.37	**1.57**	0.76	0.45	0.75	0.03	**1.95**
Business, Professional,	0.45	0.27	0.06	**0.79**	0.44	0.28	0.12	-0.03	**0.75**
Communications	0.60	0.33	0.17	**1.09**	0.59	0.33	0.34	0.09	**1.31**
Construction	1.30	0.73	0.02	**2.05**	1.28	0.80	0.04	0.01	**2.03**
Personal Services	1.51	0.95	0.70	**3.16**	1.47	1.10	1.42	-0.04	**3.88**
Other Services	0.78	0.45	0.00	**1.23**	0.76	0.47	0.00	-0.12	**1.01**

Long-run, with unemployment
Change in Portugal's exports to the US by Sector, %

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs: Goods	NTBs: Services	**Total**	Tariffs	NTBs: Goods	NTBs: Services	Spillovers	**Total**
Primary	3.68	54.61	0.02	**58.31**	4.75	132.64	0.04	-1.47	**134.69**
Processed Food	6.37	17.71	0.01	**24.10**	6.95	37.24	0.03	-0.39	**43.39**
Energy	17.40	-0.59	-0.01	**16.80**	17.52	-0.80	-0.01	0.35	**17.03**
Chemicals	7.25	11.30	-0.10	**18.45**	7.67	24.72	-0.19	-0.83	**30.57**
Electrical Machinery	-4.25	14.56	-0.34	**9.98**	-3.63	40.00	-0.75	0.03	**32.85**
Vehicles	16.56	63.55	-0.01	**80.09**	21.41	155.52	-0.03	-3.63	**170.24**
Other Transport Equipm	0.91	11.89	0.01	**12.81**	1.07	25.49	0.04	-0.10	**26.06**
Metals	21.75	22.15	0.05	**43.94**	24.48	49.58	0.09	-0.56	**72.74**
Wood, Paper, Publishing	0.10	9.54	0.02	**9.66**	0.34	20.53	0.05	-0.02	**20.48**
Textiles and Apparel	150.15	79.48	-0.02	**229.60**	146.87	70.36	-0.05	-0.10	**216.10**
Other Manufacturing	14.18	-0.87	0.03	**13.35**	14.46	-0.31	0.07	0.17	**13.90**
Airtransport	-0.18	-0.12	0.82	**0.52**	-0.12	-0.02	1.65	0.06	**1.47**
Watertransport	0.01	0.02	3.60	**3.63**	0.08	0.19	7.31	0.06	**7.35**
Other Transport	-0.10	-0.16	3.53	**3.27**	-0.02	-0.08	7.18	-0.01	**6.84**
Finance	0.00	0.12	4.39	**4.52**	0.08	0.34	8.89	0.02	**9.18**
Insurance	-0.20	-0.02	4.54	**4.31**	-0.11	0.19	9.21	0.01	**9.10**
Business, Professional,	0.26	0.18	1.25	**1.69**	0.38	0.48	2.51	0.12	**3.29**
Communications	-0.16	-0.12	0.76	**0.48**	-0.08	-0.01	1.53	0.07	**1.36**
Construction	-0.45	-0.26	1.77	**1.05**	-0.33	0.00	3.57	0.09	**3.05**
Personal Services	-0.76	-0.53	2.61	**1.32**	-0.52	-0.55	5.26	-0.14	**3.42**
Other Services	-0.34	0.10	0.02	**-0.22**	-0.20	0.38	0.04	0.01	**-0.06**

Long-run, with unemployment
Change in Portugal's exports to the EU by Sector, %

	Modest Scenario				Ambitious Scenario				
	Tariffs	NTBs: Goods	NTBs: Services	**Total**	Tariffs	NTBs: Goods	NTBs: Services	Spillovers	**Total**
Primary	-0.74	-0.21	0.00	**-0.95**	-0.73	-0.03	0.01	-0.55	**-1.33**
Processed Food	-0.26	0.18	0.01	**-0.07**	-0.24	0.56	0.02	-0.05	**0.28**
Energy	-0.42	-0.09	0.02	**-0.49**	-0.37	0.28	0.03	0.44	**0.54**
Chemicals	-3.51	-4.46	-0.06	**-8.03**	-3.48	-7.55	-0.11	-0.50	**-11.84**
Electrical Machinery	-11.26	-3.99	-0.11	**-15.36**	-10.30	-2.13	-0.28	-0.05	**-14.74**
Vehicles	-3.41	-1.33	0.01	**-4.73**	-3.91	-2.61	0.02	-0.66	**-7.31**
Other Transport Equipm	-1.95	-1.50	0.01	**-3.44**	-1.90	-2.44	0.02	0.07	**-4.27**
Metals	-2.45	-1.55	-0.01	**-4.01**	-2.43	-2.20	-0.01	0.14	**-4.60**
Wood, Paper, Publishing	-0.79	-0.17	0.01	**-0.94**	-0.72	0.30	0.02	0.04	**-0.34**
Textiles and Apparel	12.99	7.12	0.01	**20.12**	12.89	7.95	0.03	-0.26	**20.42**
Other Manufacturing	-2.31	-0.32	0.03	**-2.60**	-2.25	0.74	0.06	-0.04	**-1.58**
Airtransport	-0.28	0.02	-0.04	**-0.30**	-0.26	0.29	-0.09	0.06	**0.03**
Watertransport	-0.18	0.07	-0.01	**-0.12**	-0.16	0.39	-0.03	0.13	**0.41**
Other Transport	-0.30	0.06	-0.03	**-0.27**	-0.28	0.41	-0.12	0.07	**0.12**
Finance	-0.08	0.18	-0.05	**0.05**	-0.06	0.50	-0.10	0.06	**0.41**
Insurance	-0.34	0.12	0.00	**-0.22**	-0.32	0.54	0.00	0.04	**0.28**
Business, Professional,	-0.10	0.21	0.00	**0.12**	-0.07	0.62	0.00	0.06	**0.60**
Communications	-0.26	0.16	-0.02	**-0.11**	-0.22	0.59	-0.04	0.06	**0.38**
Construction	-0.70	-0.01	0.01	**-0.70**	-0.66	0.52	0.02	0.05	**-0.06**
Personal Services	-1.16	0.00	-0.01	**-1.16**	-1.11	0.77	-0.01	-0.02	**-0.37**
Other Services	-0.40	0.19	0.02	**-0.20**	-0.37	0.75	0.04	0.10	**0.54**

Long run, with unemployment
Change in Portugal's value-added by sector, %

	Modest scenario				Ambitious scenario				
	Tariffs	NTBs: Goods	NTBs: Services	**Total**	Tariffs	NTBs: Goods	NTBs: Services	Spillovers	**Total**
Primary	-0.21	-0.22	0.01	**-0.42**	-0.22	-0.39	0.01	-0.14	**-0.72**
Proccessed Food	-0.03	0.14	0.01	**0.12**	-0.02	0.34	0.01	-0.03	**0.30**
Energy	0.12	-0.26	0.01	**-0.13**	0.14	-0.33	0.03	0.20	**0.08**
Chemicals	-1.85	-2.24	-0.06	**-4.15**	-1.85	-3.57	-0.11	-0.37	**-6.05**
Electric Machinery	-9.30	-2.65	-0.10	**-12.04**	-8.58	-0.20	-0.23	0.27	**-10.26**
Vehicles	-1.76	0.44	0.01	**-1.32**	-1.91	1.70	0.01	-0.45	**-0.78**
Other Transport Equipm	-1.24	-0.74	0.00	**-1.98**	-1.19	-1.03	0.01	0.08	**-2.14**
Metals	-1.63	-0.93	0.00	**-2.57**	-1.61	-1.06	0.01	0.12	**-2.56**
Wood, Paper, Publishing	-0.55	-0.06	0.01	**-0.60**	-0.51	0.28	0.02	0.10	**-0.08**
Textiles and Apparel	11.88	6.19	-0.01	**18.06**	11.71	6.02	-0.02	-0.01	**17.58**
Other Manufacturing	-1.15	-0.40	0.01	**-1.54**	-1.12	0.01	0.03	0.10	**-0.99**
Airtransport	-0.26	-0.15	0.06	**-0.35**	-0.25	-0.04	0.12	0.15	**0.08**
Watertransport	0.01	0.03	0.01	**0.04**	0.02	0.15	0.01	0.22	**0.53**
Other Transport	-0.03	0.01	0.07	**0.04**	-0.03	0.10	0.13	0.12	**0.36**
Finance	0.27	0.17	0.02	**0.46**	0.28	0.27	0.03	0.05	**0.62**
Insurance	0.19	0.12	0.07	**0.39**	0.20	0.21	0.15	0.06	**0.62**
Business, Professional, I	0.13	0.09	0.01	**0.23**	0.14	0.18	0.01	0.05	**0.38**
Communications	0.11	0.10	-0.01	**0.20**	0.12	0.21	-0.01	0.06	**0.38**
Construction	0.33	0.21	0.01	**0.54**	0.34	0.33	0.02	0.08	**0.76**
Personal Services	-0.15	-0.05	-0.06	**-0.26**	-0.14	0.05	-0.13	0.09	**-0.08**
Other Services	0.18	0.14	0.01	**0.33**	0.19	0.23	0.02	0.06	**0.50**

Short-run results for Azores

Changes in Gross Value added, million Euros

		Modest scenario				Ambitious scenario				
	Pre-Agreeme	**Total**	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers
Primary production	298.40	**-0.23**	-0.04	-0.19	0.01	-2.96	-0.28	-1.44	0.02	-1.06
Energy and Petrochemicals	94.81	**0.15**	0.10	0.04	0.00	0.07	0.15	-0.18	0.02	0.06
Other manufacturing	178.27	**1.16**	0.52	0.63	0.00	1.64	0.68	1.64	0.01	-0.48
Air, Water, Other Transport	385.43	**1.07**	0.39	0.53	0.15	1.88	0.31	0.80	0.32	0.29
Finance, Insurance	115.98	**0.58**	0.27	0.29	0.03	1.14	0.58	0.83	0.08	-0.22
Business, Professional, ICT	61.99	**0.18**	0.08	0.10	0.00	0.37	0.18	0.29	0.01	-0.07
Communications	62.26	**0.21**	0.10	0.12	-0.01	0.39	0.20	0.33	-0.01	-0.08
Utilities and Construction	206.67	**0.16**	0.06	0.09	0.00	1.58	0.68	1.17	0.08	-0.26
Personal	96.84	**0.39**	0.19	0.24	-0.03	0.64	0.31	0.62	-0.06	-0.14
Other Services	1778.78	**11.70**	5.52	6.11	0.07	22.14	11.36	16.89	0.46	-4.18
Total	**3279.44**	**15.37**	**7.19**	**7.96**	**0.22**	**26.88**	**14.17**	**20.96**	**0.92**	**-6.13**

Changes in employment, thousand people

		Modest scenario				Ambitious scenario				
	Pre-Agreeme	**Total**	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers
Primary production	10.86	-0.02	0.00	-0.01	0.00	-0.11	0.00	-0.05	0.00	-0.05
Energy and Petrochemicals	0.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other manufacturing	8.18	0.08	0.03	0.05	0.00	0.13	0.06	0.12	0.00	-0.03
Air, Water, Other Transport	10.51	0.05	0.02	0.03	0.01	0.12	0.04	0.07	0.01	0.00
Finance, Insurance	1.64	0.01	0.01	0.01	0.00	0.03	0.01	0.02	0.00	-0.01
Business, Professional, ICT	1.81	0.02	0.01	0.01	0.00	0.03	0.02	0.02	0.00	-0.01
Communications	0.94	0.01	0.00	0.00	0.00	0.02	0.01	0.01	0.00	0.00
Utilities and Construction	12.51	0.01	0.01	0.01	0.00	0.17	0.08	0.13	0.01	-0.03
Personal	7.95	0.04	0.02	0.03	0.00	0.08	0.04	0.08	0.00	-0.02
Other Services	48.63	0.42	0.20	0.22	0.00	0.81	0.42	0.62	0.02	-0.16
Total	**103.76**	**0.64**	**0.30**	**0.34**	**0.01**	**1.27**	**0.68**	**1.03**	**0.03**	**-0.32**

Changes in exports to the EU, thousand Euros

		Modest scenario				Ambitious scenario				
gtap sectors	Pre-Agreeme	**Total**	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers
Primary production	731.36	-1.61	-2.35	0.73	0.01	-15.82	-7.05	-5.22	-0.11	-3.70
Processed Food	3008.50	-1.44	-5.31	3.89	-0.02	-9.70	-14.00	2.54	-0.22	0.96
Energy and Petrochemicals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chemicals, Parma, Cosmetics	13.69	-0.13	-0.09	-0.05	0.00	-0.62	-0.20	-0.32	0.00	-0.08
ElectricMachinery	2.81	-0.04	-0.01	-0.03	0.00	-0.13	-0.06	-0.07	0.00	-0.01
Motor Vehicles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Transport Equipment	361.63	-5.84	-2.67	-3.17	0.00	-14.05	-5.19	-8.90	0.08	-0.02
Metals	7.28	-0.09	-0.05	-0.04	0.00	-0.24	-0.12	-0.12	0.00	0.00
Wood, paper, publishing	5.93	-0.01	0.00	-0.01	0.00	-0.06	-0.05	-0.02	0.00	0.01
Textiles, Clothing, Leather	53.83	0.49	0.17	0.31	0.01	5.56	3.85	3.46	0.04	-1.08
Other Manufacturing	420.72	0.97	-1.03	1.99	0.01	2.20	-3.40	6.53	0.22	-0.82
Total	**4605.75**	**-7.69**	**-11.33**	**3.62**	**0.02**	**-32.86**	**-26.22**	**-2.12**	**0.01**	**-4.73**

Changes in exports to the US, thousand Euros

		Modest scenario				Ambitious scenario				
gtap sectors	Pre-Agreeme	**Total**	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers
Primary production	21334.93	13274.00	1153.70	12119.21	1.16	28935.07	1105.84	28436.52	-1.21	-298.25
Processed Food	36910.16	8836.06	2473.36	6365.08	-2.35	15620.20	2509.94	13372.11	2.40	-125.58
Energy and Petrochemicals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chemicals, Parma, Cosmetics	472.20	116.50	51.50	65.10	-0.10	175.12	48.20	134.43	-0.05	-4.60
ElectricMachinery	727.65	226.53	65.61	161.54	-0.62	360.32	54.85	315.75	-2.18	-3.06
Motor Vehicles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Transport Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Metals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wood, paper, publishing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Textiles, Clothing, Leather	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Manufacturing	12.45	2.03	2.06	-0.03	0.00	1.92	2.00	-0.03	0.01	-0.02
Total	**59457.39**	**22455.12**	**3746.24**	**18710.90**	**-1.92**	**45092.63**	**3720.83**	**42258.79**	**-1.04**	**-431.51**

Changes in imports from the EU, thousand Euros

		Modest scenario				Ambitious scenario				
gtap sectors	Pre-Agreeme	**Total**	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers
Primary production	2759.37	-14.37	5.03	-19.45	0.05	-25.01	22.62	-27.87	0.72	-14.24
Processed Food	9482.37	15.05	14.70	0.15	0.19	28.41	55.38	28.41	1.93	-41.51
Energy and Petrochemicals	2.75	0.01	0.00	0.00	0.00	-0.01	0.01	-0.01	0.00	0.00
Chemicals, Parma, Cosmetics	239.04	0.50	0.45	0.06	0.00	5.66	2.35	4.52	-0.04	-0.81
ElectricMachinery	57.77	-0.05	0.04	-0.09	0.00	-0.67	0.27	-0.66	-0.01	-0.25
Motor Vehicles	129.76	-0.03	0.06	-0.10	0.00	0.29	0.42	0.66	0.02	-0.64
Other Transport Equipment	657.16	-8.58	-2.26	-6.32	0.00	-10.48	0.67	-9.41	0.15	-1.54
Metals	257.74	-0.19	0.02	-0.21	0.00	-1.08	0.27	-0.67	0.00	-0.44
Wood, paper, publishing	134.00	0.25	0.22	0.03	-0.01	0.63	1.02	0.27	0.02	-0.48
Textiles, Clothing, Leather	31.32	0.44	0.35	0.09	0.00	-0.82	0.13	-0.57	-0.02	-0.20
Other Manufacturing	1036.95	-2.46	-0.12	-2.28	-0.05	-1.95	4.01	-7.63	-0.11	1.30
Total	**14788.23**	**-9.43**	**18.50**	**-28.11**	**0.18**	**-5.03**	**87.14**	**-12.97**	**2.65**	**-58.80**

Changes in imports from the EU, thousand Euros

		Modest scenario				Ambitious scenario				
gtap sectors	Pre-Agreeme	**Total**	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers
Primary production	24826.52	11276.53	3192.69	8081.47	2.42	22944.37	4096.81	18914.64	10.85	-171.03
Processed Food	31384.63	14559.31	10075.45	4478.40	5.51	20061.26	10940.29	9219.75	9.96	-126.25
Energy and Petrochemicals	386.83	58.85	57.14	1.52	0.19	62.06	57.60	4.20	0.41	-0.30
Chemicals, Parma, Cosmetics	6811.16	2155.81	1307.61	845.11	3.11	3086.24	1467.27	1633.64	3.81	-19.32
Electric Machinery	281.38	97.40	34.68	62.12	0.60	202.89	36.32	168.77	2.40	-7.60
Motor Vehicles	1511.07	2270.92	1203.12	1066.38	1.40	4205.80	1566.90	2624.93	1.72	-1.01
Other transport equipment	1871.03	320.68	148.72	171.41	0.56	545.76	171.04	373.45	0.42	-3.62
Metals	3803.90	2983.70	1846.89	1134.95	1.88	4745.01	2118.73	2605.84	-1.46	3.66
Wood, paper, publishing	2441.65	600.32	168.78	430.75	0.78	1128.33	199.69	935.81	-0.25	-9.74
Textiles, Clothing, Leather	3037.54	4456.19	2521.10	1930.49	4.53	3090.10	2033.75	1184.59	-3.08	50.35
Other Manufacturing	12451.78	1480.94	1378.08	97.27	5.59	1733.93	1420.62	202.69	0.66	35.35
Total	**88807.49**	**40260.64**	**21934.25**	**18299.87**	**26.57**	**61805.75**	**24109.03**	**37868.32**	**25.45**	**-249.51**

Macro results

	Modest scenario				Ambitious scenario				
% Changes in	**Total**	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers
GDP	0.53	0.30	0.25	0.16	0.95	0.65	0.65	0.01	0.13
Employment	-0.19	-0.14	-0.05	0.00	-0.08	-0.14	0.01	0.01	0.04
Manufacturing exports to the EU	-0.51	-0.52	0.00	0.01	-0.32	-0.50	0.30	0.02	-0.12
Manufacturing exports to the US	36.15	5.28	30.86	0.01	75.92	6.03	71.40	0.02	-0.77
Manufacturing imports from the EU	0.21	0.34	-0.13	0.00	-0.39	0.32	-0.59	0.00	-0.09
Manufacturing imports from the US	44.92	24.93	19.97	0.02	67.97	26.56	41.11	0.05	-0.07

Long-run results with full employment for Azores

Changes in Gross value added, million Euros

	Modest Scenario				Ambitious Scenario				
	Total	Tariffs	NTBs Goods	NTBs Service	**Total**	Tariffs	NTBs Goods	NTBs Service	Spillovers
Primary production	-1.26	-0.62	-0.66	0.02	-2.16	-0.64	-1.15	0.04	-0.42
Energy and Petrochemicals	-0.12	0.11	-0.25	0.01	0.08	0.13	-0.32	0.03	0.19
Other manufacturing	-1.19	-1.11	-0.05	-0.03	-0.99	-1.01	0.49	-0.05	-0.04
Air, Water, Other Transport	-0.35	-0.38	-0.15	0.18	1.24	-0.34	0.26	0.34	0.62
Finance, Insurance	0.49	0.27	0.17	0.05	0.72	0.28	0.28	0.11	0.06
Business, Professional, ICT	0.14	0.08	0.06	0.00	0.23	0.08	0.11	0.01	0.03
Communications	0.13	0.07	0.06	0.00	0.24	0.07	0.13	-0.01	0.04
Utilities and Construction	1.13	0.68	0.43	0.02	1.57	0.69	0.68	0.05	0.16
Personal	-0.25	-0.14	-0.05	-0.06	-0.08	-0.13	0.05	-0.12	0.09
Other Services	5.79	3.24	2.42	0.13	8.90	3.31	4.14	0.29	1.13
Total	**4.50**	**2.20**	**1.98**	**0.32**	**9.77**	**2.44**	**4.68**	**0.68**	**1.86**

Changes in employment, thousand people

	Modest Scenario				Ambitious Scenario				
	Total	Tariffs	NTBs Goods	NTBs Service	**Total**	Tariffs	NTBs Goods	NTBs Service	Spillovers
Primary production	-0.06	-0.03	-0.03	0.00	-0.10	-0.03	-0.05	0.00	-0.02
Energy and Petrochemicals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other manufacturing	-0.07	-0.06	-0.01	0.00	-0.07	-0.06	0.01	0.00	0.00
Air, Water, Other Transport	-0.05	-0.04	-0.02	0.00	-0.01	-0.04	-0.01	0.01	0.02
Finance, Insurance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Business, Professional, ICT	-0.01	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00
Communications	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Utilities and Construction	0.04	0.02	0.01	0.00	0.05	0.02	0.02	0.00	0.00
Personal	-0.04	-0.03	-0.01	-0.01	-0.03	-0.03	-0.01	-0.01	0.01
Other Services	0.01	-0.01	0.02	0.00	0.09	0.00	0.06	0.01	0.03
Total	**-0.19**	**-0.15**	**-0.05**	**0.00**	**-0.08**	**-0.14**	**0.01**	**0.01**	**0.04**

Changes in exports to the EU, thousand Euros

	Modest Scenario				Ambitious Scenario				
gtap Sectors	**Total**	Tariffs	NTBs Goods	NTBs Service	**Total**	Tariffs	NTBs Goods	NTBs Service	Spillovers
Primary production	-6.93	-5.43	-1.53	0.03	-9.74	-5.33	-0.20	0.08	-4.05
Processed Food	-2.22	-7.82	5.33	0.27	8.38	-7.33	16.88	0.60	-1.48
Energy and Petrochemicals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chemicals, Parma, Cosmetics	-1.10	-0.48	-0.61	-0.01	-1.62	-0.48	-1.03	-0.02	-0.07
Electric Machinery	-0.43	-0.32	-0.11	0.00	-0.41	-0.29	-0.06	-0.01	0.00
Motor Vehicles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Transport Equipment	-12.43	-7.04	-5.42	0.03	-15.45	-6.89	-8.82	0.07	0.24
Metals	-0.29	-0.18	-0.11	0.00	-0.34	-0.18	-0.16	0.00	0.01
Wood, paper, publishing	-0.06	-0.05	-0.01	0.00	-0.02	-0.04	0.02	0.00	0.00
Textiles, Clothing, Leather	10.83	6.99	3.83	0.01	10.99	6.94	4.28	0.02	-0.14
Other Manufacturing	-10.96	-9.74	-1.34	0.12	-6.65	-9.47	3.13	0.27	-0.17
Total	**-23.59**	**-24.06**	**0.02**	**0.45**	**-14.86**	**-23.06**	**14.04**	**1.01**	**-5.65**

Changes in exports to the US, thousand Euros

	Modest Scenario				Ambitious Scenario				
gtap Sectors	**Total**	Tariffs	NTBs Goods	NTBs Service	**Total**	Tariffs	NTBs Goods	NTBs Service	Spillovers
Primary production	12439.61	784.53	11651.78	3.55	28736.99	1013.05	28298.63	9.27	-312.67
Processed Food	8893.92	2350.94	6538.36	4.80	16015.45	2563.62	13745.19	10.88	-143.32
Energy and Petrochemicals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chemicals, Parma, Cosmetics	87.14	34.26	53.34	-0.46	144.36	36.21	116.74	-0.90	-3.91
Electric Machinery	72.59	-30.90	105.97	-2.49	239.06	-26.42	291.08	-5.45	0.25
Motor Vehicles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Transport Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Metals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wood, paper, publishing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Textiles, Clothing, Leather	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Manufacturing	1.66	1.77	-0.11	0.00	1.73	1.80	-0.04	0.01	0.02
Total	**21494.93**	**3140.59**	**18349.34**	**5.41**	**45137.60**	**3588.25**	**42451.60**	**13.80**	**-459.62**

Changes in imports from the EU, thousand Euros

	Modest Scenario				Ambitious Scenario				
gtap Sectors	**Total**	Tariffs	NTBs Goods	NTBs Service	**Total**	Tariffs	NTBs Goods	NTBs Service	Spillovers
Primary production	4.29	16.14	-12.04	0.19	-31.30	14.46	-41.59	0.41	-3.11
Processed Food	17.73	20.39	-3.15	0.50	-22.26	18.48	-26.71	1.16	-13.03
Energy and Petrochemicals	-0.03	-0.01	-0.02	0.00	-0.03	-0.01	-0.04	0.00	0.01
Chemicals, Parma, Cosmetics	12.71	4.45	8.30	-0.05	19.93	4.64	16.50	-0.08	-1.15
Electric Machinery	-0.66	1.28	-1.87	-0.07	-4.82	1.48	-5.74	-0.17	0.29
Motor Vehicles	0.06	0.14	-0.07	0.00	-1.14	0.10	-0.30	0.00	-0.83
Other Transport Equipment	-4.43	0.69	-5.09	-0.04	-12.40	0.70	-12.49	-0.07	-0.15
Metals	-2.62	-0.95	-1.65	-0.03	-4.38	-1.04	-3.05	-0.05	-0.12
Wood, paper, publishing	0.48	0.64	-0.16	0.00	-0.33	0.59	-0.81	0.01	-0.12
Textiles, Clothing, Leather	-0.29	-0.05	-0.24	-0.01	-1.74	-0.06	-0.53	-0.02	-0.76
Other Manufacturing	3.88	7.49	-3.35	-0.26	1.40	7.37	-12.15	-0.49	5.07
Total	**31.12**	**50.22**	**-19.33**	**0.23**	**-57.07**	**46.71**	**-86.91**	**0.69**	**-13.88**

Changes in imports from the EU, thousand Euros

	Modest Scenario				Ambitious Scenario				
gtap Sectors	**Total**	Tariffs	NTBs Goods	NTBs Service	**Total**	Tariffs	NTBs Goods	NTBs Service	Spillovers
Primary production	12128.43	3642.76	8482.99	2.81	23208.74	4159.22	18977.35	7.45	-47.26
Processed Food	14400.36	10148.60	4246.50	4.91	19572.63	10738.32	8762.41	11.03	-25.03
Energy and Petrochemicals	54.43	55.15	-0.99	0.27	56.53	54.85	-1.72	0.55	1.25
Chemicals, Parma, Cosmetics	2143.77	1418.71	719.19	5.88	2885.57	1453.62	1441.26	13.06	-53.59
Electric Machinery	136.73	38.98	95.33	2.42	227.67	46.97	192.31	4.21	-5.84
Motor Vehicles	2156.45	1208.60	946.96	0.83	3859.48	1497.40	2350.41	2.13	-12.42
Other Transport Equipment	336.21	168.94	167.41	-0.14	520.82	173.46	341.06	-0.34	-0.46
Metals	2906.03	1837.91	1069.19	-1.11	4494.78	2046.31	2410.22	-1.99	1.10
Wood, paper, publishing	589.16	177.67	411.59	-0.10	1069.71	185.99	875.76	-0.15	-4.71
Textiles, Clothing, Leather	3545.45	1967.38	1575.13	2.90	2816.11	1778.79	1190.93	11.03	4.69
Other Manufacturing	1492.60	1476.54	17.23	-1.19	1649.99	1448.78	-32.85	-3.53	79.75
Total	**39889.62**	**22141.24**	**17730.53**	**17.50**	**60362.02**	**23583.70**	**36507.15**	**43.44**	**-62.51**

Macro results

	Modest Scenario				Ambitious Scenario				
% Changes in	**Total**	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers
GDP	-0.15	-0.10	-0.04	0.02	-0.05	-0.08	0.00	0.04	0.09
Employment	-0.19	-0.14	-0.05	0.00	-0.08	-0.14	0.01	0.01	0.04
Manufacturing exports to the EU	-0.51	-0.52	0.00	0.01	-0.32	-0.50	0.30	0.02	-0.12
Manufacturing exports to the US	36.15	5.28	30.86	0.01	75.92	6.03	71.40	0.02	-0.77
Manufacturing imports from the EU	0.21	0.34	-0.13	0.00	-0.39	0.32	-0.59	0.00	-0.09
Manufacturing imports from the US	44.92	24.93	19.97	0.02	67.97	26.56	41.11	0.05	-0.07

Long-run results with some structural unemployment for Azores

Changes in Gross Value added, million Euros

		Modest scenario				Ambitious scenario				
	Pre-Agreement	**Total**	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers
Primary production	298.40	-1.26	-0.62	-0.66	0.02	-2.16	-0.64	-1.15	0.04	-0.42
Energy and Petrochemicals	94.81	-0.12	0.11	-0.25	0.01	0.08	0.13	-0.32	0.03	0.19
Other manufacturing	178.27	-1.19	-1.11	-0.05	-0.03	-0.99	-1.01	0.49	-0.05	-0.04
Air, Water, Other Transport	385.43	-0.35	-0.38	-0.15	0.18	1.24	-0.34	0.26	0.34	0.62
Finance, Insurance	115.98	0.49	0.27	0.17	0.05	0.72	0.28	0.28	0.11	0.06
Business, Professional, ICT	61.99	0.14	0.08	0.06	0.00	0.23	0.08	0.11	0.01	0.03
Communications	62.26	0.13	0.07	0.06	0.00	0.24	0.07	0.13	-0.01	0.04
Utilities and Construction	206.67	1.13	0.68	0.43	0.02	1.57	0.69	0.68	0.05	0.16
Personal	96.84	-0.25	-0.14	-0.05	-0.06	-0.08	-0.13	0.05	-0.12	0.09
Other Services	1778.78	5.79	3.24	2.42	0.13	8.90	3.31	4.14	0.29	1.13
Total	**3279.44**	**4.50**	**2.20**	**1.98**	**0.32**	**9.77**	**2.44**	**4.68**	**0.68**	**1.86**

Changes in employment, thousand people

		Modest scenario				Ambitious scenario				
	Pre-Agreement	**Total**	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers
Primary production	10.86	-0.06	-0.03	-0.03	0.00	-0.10	-0.03	-0.05	0.00	-0.02
Energy and Petrochemicals	0.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other manufacturing	8.18	-0.07	-0.06	-0.01	0.00	-0.07	-0.06	0.01	0.00	0.00
Air, Water, Other Transport	10.51	-0.05	-0.04	-0.02	0.00	-0.01	-0.04	-0.01	0.01	0.02
Finance, Insurance	1.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Business, Professional, ICT	1.81	-0.01	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00
Communications	0.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Utilities and Construction	12.51	0.04	0.02	0.01	0.00	0.05	0.02	0.02	0.00	0.00
Personal	7.95	-0.04	-0.03	-0.01	-0.01	-0.03	-0.03	-0.01	-0.01	0.01
Other Services	48.63	0.01	-0.01	0.02	0.00	0.09	0.00	0.06	0.01	0.03
Total	**103.76**	**-0.19**	**-0.15**	**-0.05**	**0.00**	**-0.08**	**-0.14**	**0.01**	**0.01**	**0.04**

Changes in exports to the EU, thousand Euros

		Modest scenario				Ambitious scenario				
gtap sectors	Pre-Agreement	**Total**	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers
Primary production	731.36	-6.93	-5.43	-1.53	0.03	-9.74	-5.33	-0.20	0.08	-4.05
Processed Food	3008.50	-2.22	-7.82	5.33	0.27	8.38	-7.33	16.88	0.60	-1.48
Energy and Petrochemicals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chemicals, Parma, Cosmetics	13.69	-1.10	-0.48	-0.61	-0.01	-1.62	-0.48	-1.03	-0.02	-0.07
Electric Machinery	2.81	-0.43	-0.32	-0.11	0.00	-0.41	-0.29	-0.06	-0.01	0.00
Motor Vehicles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other transport equipment	361.63	-12.43	-7.04	-5.42	0.03	-15.45	-6.89	-8.82	0.07	0.24
Metals	7.28	-0.29	-0.18	-0.11	0.00	-0.34	-0.18	-0.16	0.00	0.01
Wood, paper, publishing	5.93	-0.06	-0.05	-0.01	0.00	-0.02	-0.04	0.02	0.00	0.00
Textiles, Clothing, Leather	53.83	10.83	6.99	3.83	0.01	10.99	6.94	4.28	0.02	-0.14
Other Manufacturing	420.72	-10.96	-9.74	-1.34	0.12	-6.65	-9.47	3.13	0.27	-0.17
Total	**4605.75**	**-23.59**	**-24.06**	**0.02**	**0.45**	**-14.86**	**-23.06**	**14.04**	**1.01**	**-5.65**

Changes in exports to the US, thousand Euros

		Modest scenario				Ambitious scenario				
gtap sectors	Pre-Agreement	**Total**	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers
Primary production	21334.93	12439.61	784.53	11651.78	3.55	28736.99	1013.05	28298.63	9.27	-312.67
Processed Food	36910.16	8893.92	2350.94	6538.36	4.80	16015.45	2563.62	13745.19	10.88	-143.32
Energy and Petrochemicals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chemicals, Parma, Cosmetics	472.20	87.14	34.26	53.34	-0.46	144.36	36.21	116.74	-0.90	-3.91
Electric Machinery	727.65	72.59	-30.90	105.97	-2.49	239.06	-26.42	291.08	-5.45	0.25
Motor Vehicles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other transport equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Metals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wood, paper, publishing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Textiles, Clothing, Leather	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Manufacturing	12.45	1.66	1.77	-0.11	0.00	1.73	1.80	-0.04	0.01	0.02
Total	**59457.39**	**21494.93**	**3140.59**	**18349.34**	**5.41**	**45137.60**	**3588.25**	**42451.60**	**13.80**	**-459.62**

Changes in Imports from the EU, thousand Euros

		Modest Scenario				Ambitious Scenario				
gtap Sectors	Pre-Agreement	**Total**	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers
Primary Production	2759.37	4.29	16.14	-12.04	0.19	-31.30	14.46	-41.59	0.41	-3.11
Processed Food	9482.37	17.73	20.39	-3.15	0.50	-22.26	18.48	-26.71	1.16	-13.03
Energy and Petrochemicals	2.75	-0.03	-0.01	-0.02	0.00	-0.03	-0.01	-0.04	0.00	0.01
Chemicals, Parma, Cosmetics	239.04	12.71	4.45	8.30	-0.05	19.93	4.64	16.50	-0.08	-1.15
Electric Machinery	57.77	-0.66	1.28	-1.87	-0.07	-4.82	1.48	-5.74	-0.17	0.29
Motor Vehicles	129.76	0.06	0.14	-0.07	0.00	-1.14	0.10	-0.30	0.00	-0.83
Other Transport Equipment	657.16	-4.43	0.69	-5.09	-0.04	-12.40	0.70	-12.49	-0.07	-0.15
Metals	257.74	-2.62	-0.95	-1.65	-0.03	-4.38	-1.04	-3.05	-0.05	-0.12
Wood, Paper, Publishing	134.00	0.48	0.64	-0.16	0.00	-0.33	0.59	-0.81	0.01	-0.12
Textiles, Clothing, Leather	31.32	-0.29	-0.05	-0.24	-0.01	-1.74	-0.06	-0.53	-0.02	-0.76
Other Manufacturing	1036.95	3.88	7.49	-3.35	-0.26	1.40	7.37	-12.15	-0.49	5.07
Total	**14788.23**	**31.12**	**50.22**	**-19.33**	**0.23**	**-57.07**	**46.71**	**-86.91**	**0.69**	**-13.88**

Changes in Imports from the EU, thousand Euros

		Modest Scenario				Ambitious Scenario				
gtap Sectors	Pre-Agreement	**Total**	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers
Primary Production	24826.52	12128.43	3642.76	8482.99	2.81	23208.74	4159.22	18977.35	7.45	-47.26
Processed Food	31384.63	14400.36	10148.60	4246.50	4.91	19572.63	10738.32	8762.41	11.03	-25.03
Energy and Petrochemicals	386.83	54.43	55.15	-0.99	0.27	56.53	54.85	-1.72	0.55	1.25
Chemicals, Parma, Cosmetics	6811.16	2143.77	1418.71	719.19	5.88	2885.57	1453.62	1441.26	13.06	-53.59
Electric Machinery	281.38	136.73	38.98	95.33	2.42	227.67	46.97	192.31	4.21	-5.84
Motor Vehicles	1511.07	2156.45	1208.60	946.96	0.83	3859.48	1497.40	2350.41	2.13	-12.42
Other Transport Equipment	1871.03	336.21	168.94	167.41	-0.14	520.82	173.46	341.06	-0.34	-0.46
Metals	3803.90	2906.03	1837.91	1069.19	-1.11	4494.78	2046.31	2410.22	-1.99	1.10
Wood, Paper, Publishing	2441.65	589.16	177.67	411.59	-0.10	1069.71	185.99	875.76	-0.15	-4.71
Textiles, Clothing, Leather	3037.54	3545.45	1967.38	1575.13	2.90	2816.11	1778.79	1190.93	11.03	4.69
Other Manufacturing	12451.78	1492.60	1476.54	17.23	-1.19	1649.99	1448.78	-32.85	-3.53	79.75
Total	**88807.49**	**39889.62**	**22141.24**	**17730.53**	**17.50**	**60362.02**	**23583.70**	**36507.15**	**43.44**	**-62.51**

Macro Results

	Modest Scenario				Ambitious Scenario				
% Changes in	**Total**	Tariffs	NTBs Goods	NTBs Services	**Total**	Tariffs	NTBs Goods	NTBs Services	Spillovers
GDP	0.19	0.11	0.06	0.11	0.35	0.14	0.15	0.05	0.22
Employment	-0.19	-0.14	-0.05	0.00	-0.08	-0.14	0.01	0.01	0.04
Manufacturing exports to the EU	-0.51	-0.52	0.00	0.01	-0.32	-0.50	0.30	0.02	-0.12
Manufacturing exports to the US	36.15	5.28	30.86	0.01	75.92	6.03	71.40	0.02	-0.77
Manufacturing imports from the EU	0.21	0.34	-0.13	0.00	-0.39	0.32	-0.59	0.00	-0.09
Manufacturing imports from the US	44.92	24.93	19.97	0.02	67.97	26.56	41.11	0.05	-0.07

APPENDIX B MAPPING OF MODEL SECTORS AND REGIONS

Table B-1: Mapping of Model Sectors to GTAP

No.	GTAP Sector	Model Sector	No.	GTAP Sector	Model Sector
1	pdr	1 Agro forestry fisheries	30	lum	10 Wood and paper products
2	wht	1 Agr forestry fisheries	31	ppp	10 Wood and paper products
3	gro	1 Agr forestry fisheries	32	p_c	4 Chemicals
4	v_f	1 Agr forestry fisheries	33	crp	4 Chemicals
5	osd	1 Agr forestry fisheries	34	nmm	11 Other manufactures
6	c_b	1 Agr forestry fisheries	35	i_s	9 Metals and metal products
7	pfb	1 Agr forestry fisheries	36	nfm	9 Metals and metal products
8	ocr	1 Agr forestry fisheries	37	fmp	9 Metals and metal products
9	ctl	1 Agr forestry fisheries	38	mvh	6 Motor vehicles
10	oap	1 Agr forestry fisheries	39	otn	7 Other transport equipment
11	rmk	1 Agr forestry fisheries	40	ele	5 Electrical machinery
12	wol	1 Agr forestry fisheries	41	ome	8 Other machinery
13	frs	1 Agr forestry fisheries	42	omf	11 Other manufactures
14	fsh	1 Agr forestry fisheries	43	ely	20 Other services
15	coa	2 Other primary sectors	44	gdt	20 Other services
16	oil	2 Other primary sectors	45	wtr	20 Other services
17	gas	2 Other primary sectors	46	cns	18 Construction
18	omn	2 Other primary sectors	47	trd	20 Other services
19	cmt	3 Processed foods	48	otp	20 Other services
20	omt	3 Processed foods	49	wtp	12 Water Transport
21	vol	3 Processed foods	50	atp	13 Air Transport
22	mil	3 Processed foods	51	cmn	17 Communications
23	pcr	3 Processed foods	52	ofi	14 Finance
24	sgr	3 Processed foods	53	isr	15 Insurance
25	ofd	3 Processed foods	54	obs	16 Business services
26	b_t	3 Processed foods	55	ros	19 Personal services
27	tex	11 Other manufactures	56	osg	20 Other services
28	wap	11 Other manufactures	57	dwe	20 Other services
29	lea	11 Other manufactures			

Table B-2: Mapping of Model Sectors to ISIC rev 3.1

Model Sector	ISIC Sectors
1 Agro forestry fisheries	ISIC 01-05
2 Other primary sectors	ISIC 10-14
3 Processed foods	ISIC 15-16
4 Chemicals	ISIC 24-25
5 Electrical machinery	ISIC 30-32
6 Motor vehicles	ISIC 34
7 Other transport equipment	ISIC 35
8 Other machinery	ISIC 29,31,33
9 Metals and metal products	ISIC 27-28
10 Wood and paper products	ISIC 20-22
11 Other manufacturing	ISIC 15-37, all remaining
12 Water transport	ISIC 61
13 Air transport	ISIC 62
14 Finance	ISIC 65,67
15 Insurance	ISIC 66
16 Business services	ISIC 70-74
17 Communications	ISIC 64
18 Construction	ISIC 45
19 Personal services	ISIC 91-93
20 Other services	ISIC 40,41,50,51,52,63,75,80,85,90

Table B-3 Mapping of model regions to countries

Country ISO code	Corresponding region	Country ISO code	Corresponding region	Country ISO code	Corresponding region	Country ISO code	Corresponding region
aus	Oceania	ury	LatinAmer	swe	EU26	civ	SSA
nzl	Oceania	ven	LatinAmer	gbr	EU26	gha	SSA
xoc	Oceania	xsm	LatinAmer	che	RestofWorld	gin	SSA
chn	EastAsia	cri	LatinAmer	nor	RestofWorld	nga	SSA
hkg	EastAsia	gtm	LatinAmer	xef	RestofWorld	sen	SSA
jpn	EastAsia	hnd	LatinAmer	alb	RestofWorld	tgo	SSA
kor	EastAsia	nic	LatinAmer	bgr	EU26	xwf	SSA
mng	EastAsia	pan	LatinAmer	blr	RestofWorld	xcf	SSA
twn	EastAsia	slv	LatinAmer	hrv	EU26	xac	SSA
xea	EastAsia	xca	LatinAmer	rou	EU26	eth	SSA
brn	EastAsia	dom	LatinAmer	rus	RestofWorld	ken	SSA
khm	SEAsia	jam	LatinAmer	ukr	RestofWorld	mdg	SSA
idn	SEAsia	pri	LatinAmer	xee	RestofWorld	mwi	SSA
lao	SEAsia	tto	LatinAmer	xer	RestofWorld	mus	SSA
mys	SEAsia	xcb	LatinAmer	kaz	RestofWorld	moz	SSA
phl	SEAsia	aut	EU26	kgz	RestofWorld	rwa	SSA
sgp	SEAsia	bel	EU26	xsu	RestofWorld	tza	SSA
tha	SEAsia	cyp	EU26	arm	RestofWorld	uga	SSA
vnm	SEAsia	cze	EU26	aze	RestofWorld	zmb	SSA
xse	SEAsia	dnk	EU26	geo	RestofWorld	zwe	SSA
bgd	SouthAsia	est	EU26	bhr	MENA	xec	SSA
ind	SouthAsia	fin	EU26	irn	MENA	bwa	SSA
npl	SouthAsia	fra	EU26	isr	MENA	nam	SSA
pak	SouthAsia	deu	EU26	jor	MENA	zaf	SSA
lka	SouthAsia	grc	EU26	kwt	MENA	xsc	SSA
xsa	SouthAsia	hun	EU26	omn	MENA	xtw	RestofWorld
can	NAmerica	irl	EU26	qat	MENA		
usa	USA	ita	EU26	sau	MENA		
mex	NAmerica	lva	EU26	tur	MENA		
xna	NAmerica	ltu	EU26	are	MENA		
arg	LatinAmer	lux	EU26	xws	MENA		
bol	LatinAmer	mlt	EU26	egy	MENA		
bra	LatinAmer	nld	EU26	mar	MENA		
chl	LatinAmer	pol	EU26	tun	MENA		
col	LatinAmer	prt	Portugal	xnf	MENA		
ecu	LatinAmer	svk	EU26	ben	SSA		
pry	LatinAmer	svn	EU26	bfa	SSA		
per	LatinAmer	esp	Spain	cmr	SSA		

APPENDIX C ELASTICITIES IN THE MODEL

Table C-1: Sectors and Model Elasticities employed in the modelling

	Trade substitution elasticity	Substitution in value added
Agro forestry fisheries	4.77	0.24
Other primary sectors	12.13	0.2
Processed foods	2.46	1.12
Chemicals	5.09	1.26
Electrical machinery	9.65	1.26
Motor vehicles	10	1.26
Other transport equipment	7.14	1.26
Other machinery	9.71	1.26
Metals and metal products	13.91	1.26
Wood and paper products	7.99	1.26
Other manufactures	6.56	1.26
Water transport	3.8	1.68
Air transport	3.8	1.68
Finance	2.04	1.26
Insurance	3.18	1.26
Business services	3.18	1.26
Communications	3.18	1.26
Construction	4.21	1.4
Personal services	8.71	1.26
Other (public) services	3.92	1.41

Table C-2 Trade substitution elasticities used in the Partial Equilibrium Analysis

Trade substitution elasticities	Corresponding HS codes	
certain wine products	2204	2.3
certain footwear products	64	8.1
certain pharmaceutical products	30	6.6
certain textiles & clothing	51, 52, 59, 60, 61, 62, 63 (excl. 6309)	7.5
certain machinery products	8525, 8504, 8536, 8544	8.1

APPENDIX D CGE MODEL OVERVIEW

In the computational model, the ”whole” economy, for the relevant aggregation of economic agents, is modelled simultaneously. This means that the entire economy is classified into production and consumption sectors. These sectors are then modelled collectively. Production sectors are explicitly linked together in value-added chains from primary goods, through higher stages of processing, to the final assembly of consumption goods for households and governments. These links span borders as well as industries. The link between sectors is both direct, such as the input of steel into the production of transport equipment, and also indirect, as with the link between chemicals and agriculture through the production of fertilizers and pesticides. Sectors are also linked through their competition for resources in primary factor markets (capital, labour, and land). The data structure of the model follows the GTAP database structure, and basic models of this class are implemented in either GEMPACK or GAMS (Hertel et al 1997, Rutherford and Paltsev 2000). We work here with a GEMPACK implementation.

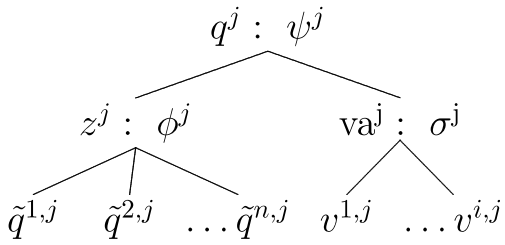
Production

We start here with a representative production technology using basic, constant returns to scale, specification. Where we have scale economies, this serves as the cost structure for composite input bundles. Assume that output q^j in sector *j* can be produced with a combination of intermediate inputs z^j and value added services (capital, labour, land, etc.) va^j. This is formalized in equation 1. Assuming homothetic cost functions and separability, we can define the cost of a representative bundle of intermediate inputs z^j for the firm producing q^j and similarly the cost of a representative bundle va^j of value added services. These are shown in equations 2 and 3. They depend on the vector of composite goods prices $\tilde{P}$ and primary factor prices w. Unit costs for q then depend on the mix of technology and prices embodied in equations 1, 2 and 3. We represent this in equation 4, which defines unit cost V^j. In the absence of taxes, in competitive sectors

V^j represents both marginal cost and price. On the other hand, with imperfect competition on the output side (discussed explicitly later) V^j can be viewed as measuring the marginal cost side of the optimal markup equation, with mark-ups driving a wedge between V^j and P^j.

To combine production technologies with data, we need to move from general to specific functional forms. We employ a nested CES function, with a CES representation of value added activities va^j, a CES representation of a composite intermediate z^j made up of intermediate inputs, and an upper CES nest that then combines these to yield the final good q^j. Our set-up is illustrated in Figure A-1 below, on the assumption we have *i* primary factors v, as well as *n* production sectors that can be represented in terms of composite goods $\tilde{q}$ as defined below.

Figure A-1: representative nested production technology



These composites may (or may not, depending on the goods involved) be used as intermediate inputs. In Figure A-1, we have also shown the CES substitution elasticity for intermediate inputs f, the substitution elasticity for value added s, and the substitution elasticity for our "upper nest" aggregation of value added and intermediates, y. In the absence of taxes, total value added *Y* will be the sum of primary factor income, as in equation 5.

Given our assumption of CES technologies, we can represent value added in sector *j* as a function of primary inputs and the elasticity of substitution in value added s^j. This yields equation 6, and its associated CES price index shown in equation 7. Similarly, we can specify the CES price index for composite intermediates, as in equation 7. This gives us equation 8, where the coefficient f^j is the elasticity of substitution between

intermediate inputs. This is assumed to be Leontief (i.e. f^j = 0). Finally, we will also specify an aggregation function for value added and intermediate inputs, in terms of its CES price index. This is shown as equation 9. From the first order conditions for minimizing the cost of production, we can map the allocation of primary factors to the level of value added across sectors. This is formalized in equation 10. We can also specify the total demand for composite intermediate goods across sectors $\tilde{q}^{\text{int},j}$ as a function of the producer price of composite input price P_{z^j} in each sector, the scale of intermediate demand across sectors z^j, and prices of composite goods $\tilde{P}_i$. This is shown in equation 11. With the upper nest CES for goods we can also map value added va^j and intermediate demand z^j in terms of equations 7 and 8, output q^j and the elasticity of substitution γ^j between inputs and value added. This yields equations 12 and 13, where the terms θ are the CES weights (similar to those in equation 6) while γ^j is the upper nest elasticity of substitution in the production function.

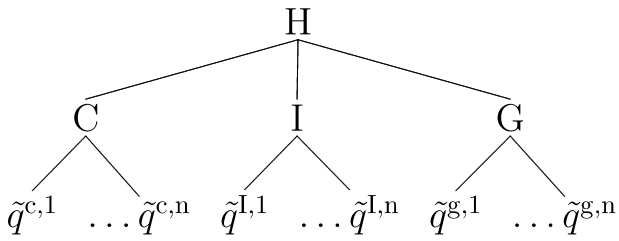
We also model some sectors as being characterized by large group monopolistic competition. In reduced form, this can be represented by an industry level scale economy that reflects variety effects. We define the price of output at industry level as in equation 14. In this case, V^j is defined by equation 9 and represents the price of a bundle of inputs, and equation 14 follows directly from average cost pricing, homothetic cost functions, and Dixit-Stiglitz type monopolistic competition. (See Francois and Roland-Holst 1997, Francois 1998, and Francois, van Meijl, and van Tongeren 2005 for explicit derivations.)

Together, equations 1 through 14 map out the production side of the economy. For an open economy, given resources, technology (represented by technical coefficients in the CES functional forms), and prices for foreign and domestic goods and services, we can determine factor incomes, national income, and the structure of production. We close this system by discussion of the demand side of the economy, and basic open economy aspects, in the next sections.

Final Demand

In the system we have spelled out so far, we have mapped the basic, national structure of production. We close the system with a demand specification for a representative household. This involves allocation of regional income by the household to composite consumption H, which is separated over private consumption C, public consumption G, and investment I. Each of these components of H involves consumption of composite goods and services $\tilde{q}$ indexed by sector *j*. This is illustrated in Figure 3 below. Where we assume fixed expenditure shares (i.e. with H taking a Cobb-Douglas functional form), then we also have a fixed savings rate. Otherwise, given the equilibrium allocation of household income to consumption and investment, we will denote these expenditure shares by α. We maintain a fixed-share allocation between public and private consumption.

Figure 4: representative household demand



We assume a well-defined CES utility function for personal consumption defined over goods $\tilde{q}$. From the first order conditions for utility maximization, we can then derive the price of utility from private consumption P_U as a function of prices $\tilde{P}$, as in equation 15. The corresponding expenditure function is then $U = U^c P_U$ where U^c is the level of utility from private consumption. Taking national income as our budget constraint, then combining equation 5 with the expenditure function yields equation 16. From 16, we can define U^c from the expenditure function and income, as in equation 17. Consumption quantities, in terms of composite goods, can be recovered from equation 17, as shown in equation 18. Like private consumption, the public sector is also modelled with a CES demand function over public sector consumption. This implies equations 19-22. For investment demand, in the short-run, we assume a fixed savings

rate. In the long-run, the model can alternatively incorporate a fixed savings rate, or a rate that adjusts to meet steady state conditions in a basic Ramsey structure with constant relative risk aversion (CRRA) preferences. We employ the CRRA version here. (Francois, McDonald and Nordstrom 1996). With fixed savings, and assuming a Leontief composite of investment goods that make up the regional investment good, investment demand is defined by equation 23. With CRRA preferences, steady-state conditions implies equation 24 as well, related to the price of capital w_k. Where 24 holds, the additional equation allows us to make the savings rate coefficient α^I endogenous. In equation 24 r is the rate of time discount and α is the rate of depreciation. With a short-run or static closure, investment demand means we apply equation 23. With a long-run closure, we also apply equation 25. When we impose CRRA preferences in the long-run, we then employ all three equations on the model 23-25, and savings rates are endogenous. With a fixed savings rate, we drop equation 24 and make α^I exogenous.

Cross-border linkages and taxes

Finally, individual countries, as described by equations 1-25 above, are linked through cross border trade and investment flows. With either monopolistic competition or Armington preferences, we can define a CES composite good $\tilde{q}$ in terms of foreign and domestic goods. The price index for this composite good is defined by equation 26. Given equation 26 and the envelope theorem, we can define domestic absorption D as in equation 27, where *h* indexes home prices and quantities. The difference between production q_j and domestic absorption D_j in equilibrium will be imports (where a negative value denotes exports), as in equation 28. Across all countries indexed by *r*, we also have a global balanced trade requirement, shown in equation 29. Similarly, balancing the global capital account also requires equations 30 and 31 (where we now index source *r* and home destination *h*).

Trading costs are modelled as in ECORYS (2009), and benchmark values for NTBs come from this source. Information on the extent to which policies affect prices and costs is important for accurate modelling of policy reforms, including whether policies create ”rents” as opposed to being resource-using (generating ”waste”), and the identity

(ownership) of the entities and groups to whom any rents accrue. This is a well-known issue that can have a major bearing on the magnitude of the welfare impacts of policies and policy reforms. For example, if a policy generates rents for domestic groups and liberalization results in a share of these rents accruing to foreign entrants, the result may be lower national welfare. Recent work supported by the EC (ECORYS 2009, Copenhagen Economics 2009) has been focused explicitly on this distinction, and the results of this analysis feed into the estimated reported in this study. In the estimates below, we distinguish between cost and rent generation under NTBs on the basis of ECORYS (2009), assuming 2/3 of rents accrue to importer interests, and 1/3 to exporter interests. Rents are modelled, in effect, like export and import taxes. For cost-raising barriers, we follow the now standard approach to modelling iceberg or dead-weight trade costs in the GTAP framework, originally developed by Francois (1999, 2001) with support from the EC to study the Millennium Round (now known as the Doha Round). This approach has grown from an extension in early applications to a now standard feature of the GTAP model, following Hertel, Walmsley and Itakura (2001). It has featured in the joint EC-Canadian government study on a EU-Canada FTA, as well as the 2009 ECORYS study on EU-US non-tariff barriers. In formal terms, changes in the value of this technical coefficient capture the impact of non-tariff measures on the price of imports from a particular exporter due to destination-specific reduced costs for production and delivery.

The basic system outlined above provides the core production and demand structure of each region, as well as the basic requirements for bilateral import demand, global market clearing for traded goods and services, and global capital account balancing. Within this basic structure, we also introduce taxes, transport services, iceberg (deadweight) non-tariff barriers, and rent-generating non-tariff barriers. These drive a wedge between the ex-factory price originating in country *r* and the landed prices in country *h* inclusive of duties and transport costs. Taxes and rent-generating trade costs mean that *Y* is also inclusive of tax revenues and rents. In the short-run we fix *B*, while in the long-run this is endogenous (such that the distribution of relative global returns is maintained). All of this adds additional complexity to the system outlined above, but the core structure remains the same.

(1) $q^j = f^j\left(z^j, \mathrm{va}^j\right)$

(2) $P_z = g\left(\tilde{P}\right)$

(3) $P_{\mathrm{va}} = h\left(\omega\right)$

(4) $\zeta_j = c\left(P_z, P_{\mathrm{va}}\right)$

(5) $Y = \sum_i \omega_i v_i$

(6) $\mathrm{va}_j = \left[\sum_i \alpha_{ij} v_{ij}^{\frac{\sigma^j - 1}{\sigma^j}}\right]^{\frac{1}{\sigma^j - 1}}$

(7) $P_{v^j} = \left[\sum_i \alpha_{ij}^{\sigma^j} \omega_i^{1-\sigma^j}\right]^{\frac{1}{1-\sigma^j}}$

(8) $P_{z^j} = \left[\sum_i \beta_{ij}^{\phi^j} \tilde{P}_i^{1-\phi^j}\right]^{\frac{1}{1-\phi^j}}$

(9) $P_j = \left(\gamma_{vj}^{\psi^j} P_{\mathrm{va}^j}^{1-\psi^j} + \gamma_{zj}^{\psi^j} P_{z^j}^{1-\psi^j}\right)^{\frac{1}{1-\psi^j}}$

(10) $v_i \geq \sum_j \mathrm{va}^j \left(\frac{\alpha_{vj}}{\omega_i}\right)^{\sigma^j} P_{\mathrm{va}^j}$

(11) $\tilde{q}^{\mathrm{int,i}} = \sum_j z^j \left(\frac{\beta_{ij}}{\tilde{P}_i}\right)^{\phi^j} P_{z^j}$

(12) $\mathrm{va}^j = q^j \left(\frac{\gamma_{vi}}{P_{v^j}}\right)^{\psi^j} P_j$

(13) $\bar{z}^j = q^j \left(\frac{\gamma_{zi}}{P_{z^j}}\right)^{\psi^j} P_j$

(14) $P_j = q_j^{\psi} \left(\gamma_{vj}^{\psi^j} P_{\mathrm{va}^j}^{1-\psi^j} + \gamma_{zj}^{\psi^j} P_{z^j}^{1-\psi^j}\right)^{\frac{1}{1-\psi^j}}$
where $1 > \psi > 0$

(15) $P_{U^c} = \left(\sum_{i=1}^{n} \alpha_{c,i}^{\eta^c} \tilde{P}_i^{1-\eta^c}\right)^{\frac{1}{1-\eta^c}}$
where $0 < \frac{\eta^c - 1}{\eta^c} < 1$

(16) $U^c \left(\sum_{i=1}^{n} \alpha_{c,i}^{\eta^c} \tilde{P}_i^{1-\eta^c}\right)^{\frac{1}{1-\eta^c}} = Y\theta^c$

(17) $U^c = \left(\sum_{i=1}^{n} \alpha_{c,i}^{\eta^c} \tilde{P}_i^{1-\eta^c}\right)^{\frac{1}{\eta^c - 1}} Y\theta^c$

(18) $\tilde{q}^{c,i} = U^c P_{U^c}^{\eta^c} \alpha_{c,i}^{\eta^c} \tilde{P}_i^{-\eta^c}$

(19) $P_{U^g} = \left(\sum_{i=1}^{n} \alpha_{g,i}^{\eta^g} \tilde{P}_i^{1-\eta^g}\right)^{\frac{1}{1-\eta^g}}$
where $0 < \frac{\eta^g - 1}{\eta^g} < 1$

(20) $U^g \left(\sum_{i=1}^{n} \alpha_{g,i}^{\eta^g} \tilde{P}_i^{1-\eta^g}\right)^{\frac{1}{1-\eta^g}} = Y\theta^g$

(21) $U^g = \left(\sum_{i=1}^{n} \alpha_{g,i}^{\eta^g} \tilde{P}_i^{1-\eta^g}\right)^{\frac{1}{\eta^g - 1}} Y\theta^g$

(22) $\tilde{q}^{g,i} = U^c P_{U^c}^{\eta^g} \alpha_{g,i}^{\eta^g} \tilde{P}_i^{-\eta^g}$

(23) $\left(\sum_{j=1}^{n} \alpha_{I,j} \tilde{P}_j\right) = Y\theta^I$

(24) $\omega_k = P^c\left(\rho + \delta\right)$

(25) $dK/K = dI/I$

(26) $\tilde{P}_j = \left(\sum_{r=1}^{R} b_{r,j}^{s^j} P_{r,j}^{1-s^j}\right)^{\frac{1}{1-s^j}}$
where $0 < \frac{s^j - 1}{s^j} < 1$

(27) $D_j = \left(\tilde{q}^{\mathrm{c,j}} + \tilde{q}^{\mathrm{I,j}} + \tilde{q}^{\mathrm{g,j}} + \tilde{q}^{\mathrm{int,i}}\right) \tilde{P}_j^s b_{h,j}^s P_{h,j}^{-s}$

(28) $M_j = D_j - q_j$

(29) $\left(\sum_{r=1}^{rr} M_{r,j}\right) = 0$

(30) $\left(\sum_j \sum_{r \neq h} P_{r,j} M_{r,h,j}\right) = B_h$

(31) $\left(\sum_r B_r\right) = 0$