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Analyzing the impact of a EU-Tunisia DCFTA on Tunisian trade and production

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Introduction

Economic integration between the European Union (EU) and Tunisia has a long history. The first Cooperation Agreement was signed in 1976, and this was followed by an Association Agreement which was signed in 1995 and came into force in 1998. The Association Agreement was part of the EU's Barcelona Process which aimed at closer integration with the Southern Mediterranean countries (or the EU's Southern Neighbourhood as it subsequently became known).

Since 2016, the EU and Tunisia have been in the process of negotiating a "Deep and Comprehensive Free Trade Agreement (DCFTA)". The proposed DCFTA forms part of the on-going development of the EU's European Neighbourhood policy particularly with regard to the Southern Neighbourhood. To date, three Eastern Partnership Countries (Ukraine, Georgia and Moldova) have concluded DCFTAs with the EU. These DCFTAs provide for much closer integration with the EU and considerably more approximation to the EU's Single Market than has been achieved by any of existing Association Agreements with the Southern Neighbourhood countries.

The EU-Tunisia DCFTA is hence intended to build upon the existing Association Agreement (AA), by increasing both the scope and depth of the existing trading relations. With regard to scope, where the existing AA is largely focused on manufactured goods, the DCFTA aims to also achieve more agricultural liberalisation and to some extent services liberalisation. With regard to depth, the objective is to provide for much more meaningful "deep" integration through the greater elimination of non-tariff barriers to trade for example with regard to technical standards, closer legislative approximation to the EU's Single Market, and improved trade facilitation measures.

These proposed changes in tariffs, quotas and non-tariff barriers will impact on trade between the EU and Tunisia, as well as with third countries. Currently there is very little empirical evidence of what the impact on patterns of trade might be. In addition, the existing evidence is largely based on Computable General Equilibrium (CGE) models. While CGE models are extremely useful, and have the advantage of incorporating product and factor market linkages, they do have some drawbacks. Notably, one issue which arises with a CGE models is that the data is often somewhat outdated. For example, the widely used GTAP dataset which is notionally based on the year 2011, contains input-output data for Tunisia which is based on the 1995 Tunisian input-output tables. Secondly, the data is typically aggregated to a fairly high sectoral level.

In contrast to the existing literature, this paper applies a multi-market partial equilibrium (PE) model based on the most recent data available. This provides a granular analysis of the possible impact on the trade and production of specific Tunisian manufacturing industries. In this paper, we build upon standard PE models in two dimensions. The standard PE model is based on the Armington assumption (where products are differentiated by source), and the two limitations are: (a) that the standard PE models assume perfect competition, and (b) that they do not allow for multi-market supply linkages[1]. Indeed, some models of this class are also single country models focussing solely on the imports of a given country (eg. Tunisia) from different sources, and thus they do not take into account the simultaneity of imports and exports between different markets. In contrast, in this paper we use both a standard Armington model and compare those results to those derived from a multi-market, imperfectly competitive model.

The paper is organised as follows. The first section summarises the background to the integration process between Tunisia and the EU, as well as identifying the key changes in the patterns of trade. The second section provides a literature review which summarises existing studies on the impacts of closer integration. In the third section we detail the model used. The fourth section discusses the results, and the final section concludes.

1. Background

Following on from the perceived minimal success of the Association Agreement, and also from the upheavals caused by the so-called 'Arab Spring', the 2015 ENP review by the European Commission saw a shift in emphasis in the EU's approach to its neighbours. This shift resulted in a greater focus on issues of security and stability, more differentiation in policy between countries, a greater recognition of the importance of mutual interests as opposed to mutual values, and a move away from overt demands for democratic transformation. In this regard, the EU-Tunisia DCFTA and the current negotiations form part of this evolution.

The aim of the EU-Tunisia DCFTA is to achieve a more ambitious degree of liberalisation between the EU and Tunisia than was achieved under the Association Agreement (AA), and subsequent sectoral agreements. The scope and depth of the existing AA was largely limited to tariff dismantling of manufactured goods, and provided for the progressive elimination of customs duties over a period of 12 years. As a result there has been some gradual liberalization, except for agri-food products which have been the subject of special treatment.

Specifically, the tariff dismantling process envisioned by the AA concerned exclusively industrial products from the EU, with a schedule comprising four product lists depending on the nature of the industrial goods and whether or not they support foreign competition:

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[1] In the standard Armington model (upward sloping), supply is determined separately in each market. Hence if Tunisian exports increase to the EU, this would increase the costs of supply to the EU, but would have no impact on the costs of supply to any other market. This is not a very realistic assumption.

List 1: Industrial products, in the form of raw materials or equipment. Customs barriers were to be removed from the very beginning.

List 2: Finished products not manufactured locally, for which the decommissioning was to take place gradually over a period of 4 years (1998-2002).**List 3:** Finished products manufactured locally and likely to be able to withstand foreign competition. Decommissioning was to take place gradually over 12 years (1998-2010).

List 4: Local products intended mainly for the domestic market and with little exposure to international competition. The tariff dismantling of these products, with strong protection, was to be gradual over 8 years (1998-2006) following an initial grace period of 4 years (1998-2002).

While the EU was successful in negotiating additional protocols on agriculture with other Mediterranean partners, such as Egypt and Morocco, further liberalisation with Tunisia was not achieved[2]. The dismantling of tariffs for agri-food products concerned only their industrial content (element). Agricultural content, like all agricultural products, was not covered by the AA. In the same way, certain consumer rights were maintained for specific products (wines and spirits, automobiles, luxury goods, etc.) despite dismantling.

Chart.1: Tunisian applied tariffs on the EU27 (2016) *
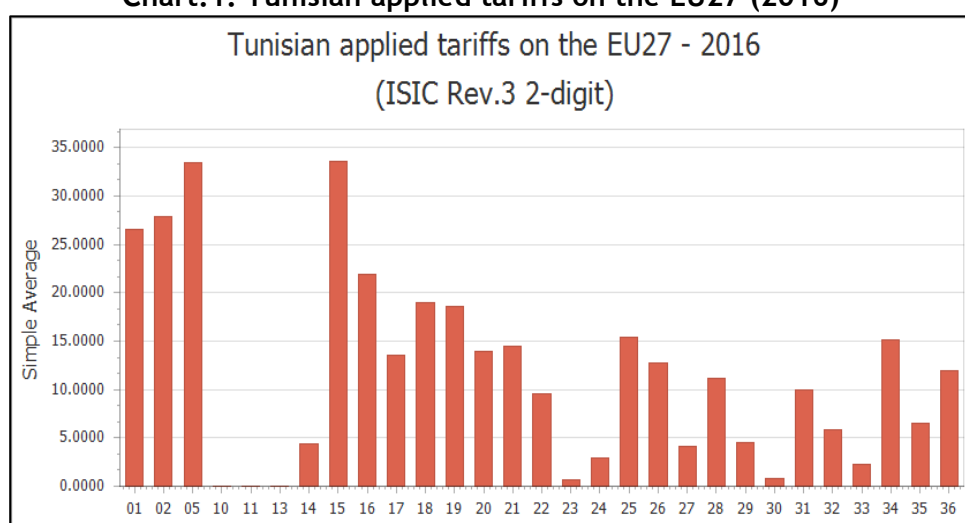
(*) ISIC Rev.3, 2-digit; **Source:** UN Trains, using TradeSift

The lists above provide what was notionally in the agreement, in practice there appears to have been a lack of progress with regard to tariff dismantling. This can be seen in the chart above. Chart 1 gives the level of Tunisian applied tariffs on the EU in 2016. What is immediately clear from this is that widespread tariffs remain, and that many of these tariffs are still high.

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[2] Following the deterioration of the security situation in 2015, the EU offered a temporary increase in the tariff rate quota on imports of Tunisian olive oil.

In contrast the objective of the DCFTA is to liberalise trade in most goods (and in particular to include more agriculture) and services, and to improve market access through the removal of barriers in relevant trade related areas such as public procurement, competition policy, and technical barriers to trade. In so doing the objective is to integrate Tunisia much more closely into the EU's internal market. For example, with regard to technical barriers to trade, the DCFTA aims to address issues ranging from the preparation, adoption and application of technical regulations, standards and accreditation and conformity assessment procedures to rules on the marking and labelling of products and cooperation in the field of technical regulations, standards, metrology, and market surveillance. From an economic perspective the aim is to improve the competitiveness and growth of the Tunisian economy through encouraging more integration, trade and investment. However, it is worth noting that there are also clear political, security and economic objectives to this policy.

1.1. The evolving pattern of Tunisia's trade with EU

The European market has long been an important source of imports and a destination for the exports of Tunisia. Although the relative importance of the EU has declined over time, and particularly over the last 10-15 years, nevertheless the EU remains an important market for Tunisia. This can be seen in the chart below which tracks the share of the EU27 member states in Tunisian imports and exports. From this we can see that the share of the EU27 in imports has declined, notably since the mid-1990s from a high of over 75% to around 55% in 2015. The share of the EU in Tunisian exports has also declined somewhat from a high of over 80% in the early 2000s, to just over 75% in 2015.

Chart.2: Share of Tunisian imports and exports with EU (%)
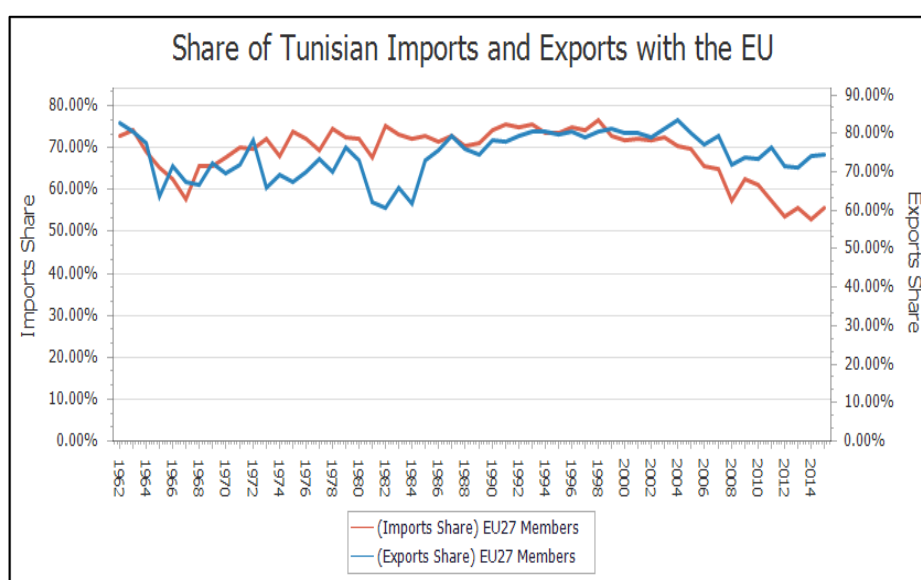
Source: UN Comtrade, using TradeSift.

This chart alone raises several questions regarding the relative success (or not) of the Association Agreement in deepening economic relations between the EU and Tunisia. On the face of it, the chart suggests little evidence of increased trade, and possibly therefore little evidence of much impact. With regard to Tunisian imports, part of the explanation for this may be seen from the earlier chart regarding the level of tariffs on EU imports – which remain high. However, it is not simply the level of tariffs that matters, but also the changes. In the chart below we give the average MFN tariffs levied by Tunisia in 1995 (hence just before the Barcelona process) and in 2016. These are the tariffs levied on all (non-preferential) countries. The height of the blue bar gives the 1995 tariffs, and the red bar the 2016 tariffs.

Chart.3: Tunisian MFN tariffs (%)
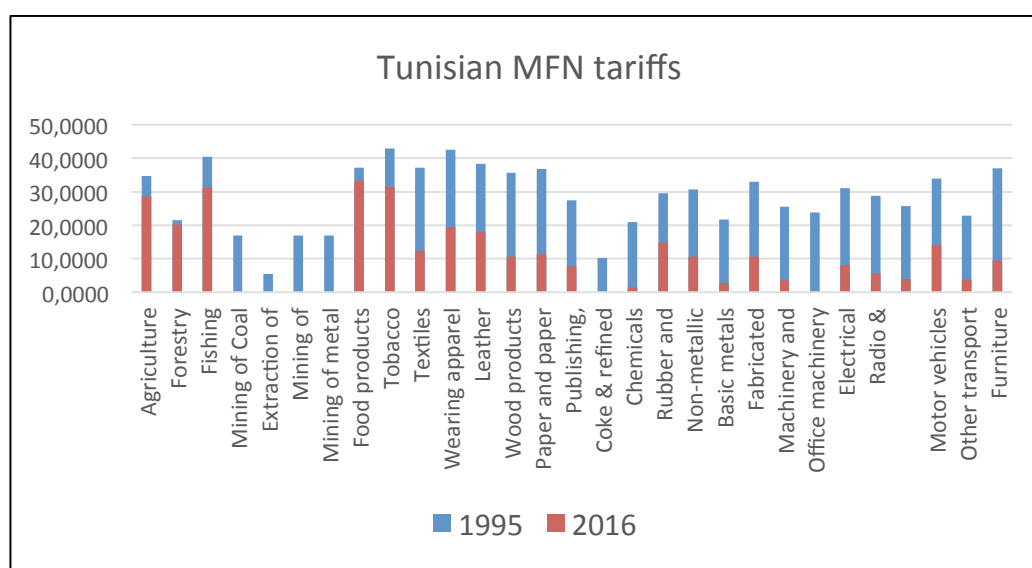
Source: UN Trains database

Several conclusions emerge from this. First, we see a fair degree of liberalisation by Tunisia, but from a starting point where tariffs were generally high. In all cases tariffs are somewhat higher in 1995 than in 2016. In some industries such as extraction and mining, these tariffs have fallen to zero, in others where there were previously very high tariffs they have been substantially reduced, although they remain high. A good example is that of apparel where tariffs were over 40%, and are now closer to 20%. Other sectors such as electrical machinery and furniture have seen a greater degree of liberalisation.

Second, although this cannot be directly discerned from this graph, is that the change in tariffs over this period with regard to the EU are almost identical. Hence, since the start of the Barcelona process, it is not that Tunisia has just been liberalising with regard to the EU, it has simultaneously been lowering its MFN tariffs on all imports. This almost certainly goes a long way to explaining the decline in the share of imports coming from the EU. It is worth commenting here, that an oft-cited concern with regard to regional integration is that it can lead to trade diversion. Trade diversion here is unlikely to have occurred because of the generalised reduction in MFN tariffs. Of course it is possible that this generalised reduction was stimulated by the Barcelona process of integration, and to the

extent that this is the case then this could be seen as a positive effect. The third conclusion is that MFN tariffs remain higher across a range of sectors.

Chart 4: Correlation between the changes in Tunisian imports from the EU with changes in EU revealed comparative advantage: 1995-2017
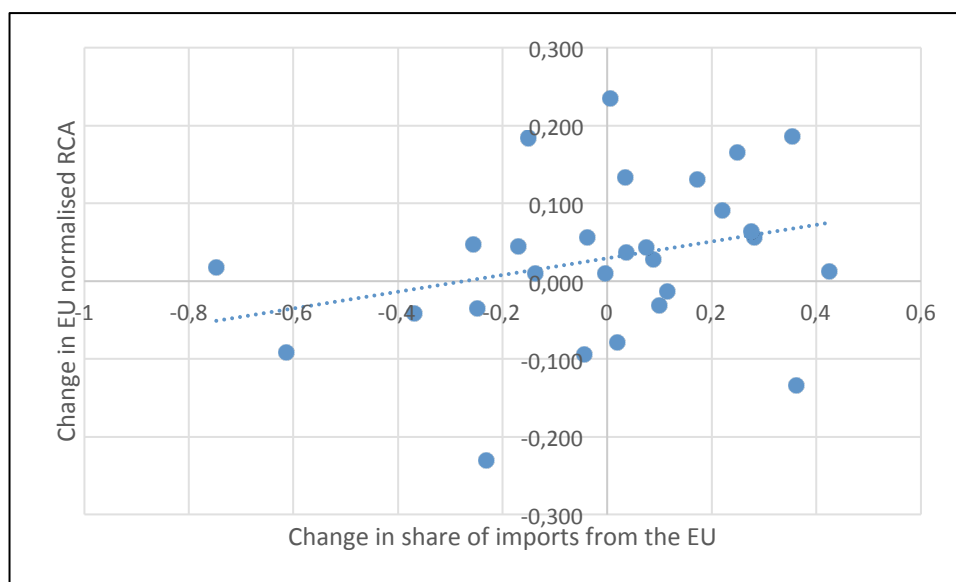
Source: UN Comtrade, calculations using TradeSift

This raises a further consideration – which is that the changes in observed trade flows will of course be affected by the (changes in the) underlying tariff structures between the EU and Tunisia. But they will also be affected by changes in economic growth and competitiveness of third countres. Hence, it is entirely possible that reductions in Tunisian tariffs on EU imports led to increased imports from the EU, but that the growing competitiveness of other countries may have been greater, such that the share coming from the EU declined. Consider Chart 4 above, which provides a somewhat aggregate yet revealing way of considering this issue. The chart plots the *changes* in the EU's share of Tunisian imports over the period 1995-2017 (using the ISIC rev.3 2-digit level of classification), with the *changes* in the EU's normalised revealed comparative advantage over the same time period. Even at this aggregate level we see a positive correlation (the correlation coefficient is 0.28) which suggests that in those industries in which the EU was losing worldwide competitiveness, its' share in Tunisia imports was declining, and vica versa. This is only indicative yet highly suggestive.

As mentioned above, the reduction in MFN tariffs, has also led to the growing diversification of the source of Tunisian imports. This is reflected in the chart below which gives the Trade Concentration Index by partner country for Tunisia over the same time period for both imports and exports[3]. The index ranges

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[3] The Trade Concentration Index is aimed at assessing the degree of concentration / diversification of a given country's trade. The index is based on the Hirschmann-Herfindahl Index, which ranges between zero and one. The index can, in principle either be calculated by product or by country. The TCI is a summary measure which aggregates information from across a range of sectors,

between 0 and 1, and the more diversified is a country in its trade, be this with regard to imports or exports, the lower is the index. From the chart we can see that Tunisian trade was highly concentrated on a relatively few partner countries in the early 1960s, which was then followed by a process of diversification until the mid 1980s. From the mid-1980's onwards once again the range of countries with whom Tunisia traded appears to have narrowed, followed by a more substantial diversification, especially with regard to imports since the early 2000s. Since the 1970s however, the changes in export diversification have been more modest.

Chart.5: Tunisia trade diversification by country
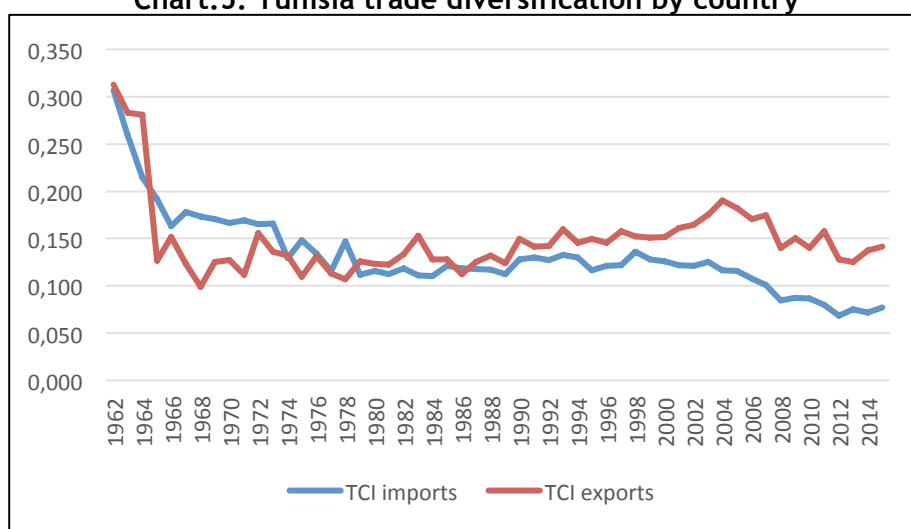
Source: UN Comtrade, calculated using TradeSift

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subsectors or products. Hence the index can be provided either for all trade, or for particular sectors.

The diversification of imports in the more recent period has been largely driven by the rising share of countries such as China and Turkey, as well as Algeria in Tunisia's imports. This can be seen from the chart below.

Chart.6: Share of Tunisian imports from selected countries (%)
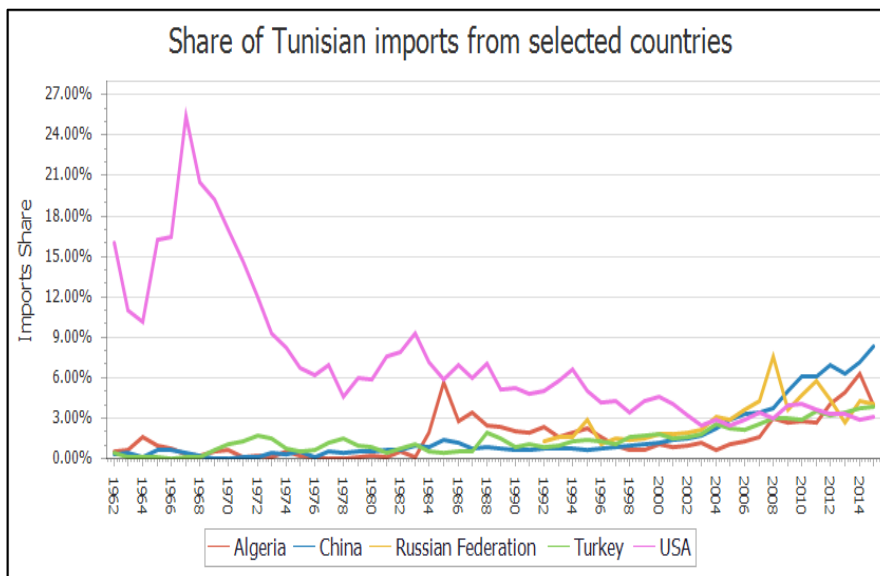
Source: UN Comtrade, calculated using TradeSift

1.2. Implications of the AA for sectoral transformations

The previous charts largely focused on aggregate trade. It is also important to look at the decomposition of trade, and changes in trade by industry.

Chart.7: Tunisian exports to the World (2016)
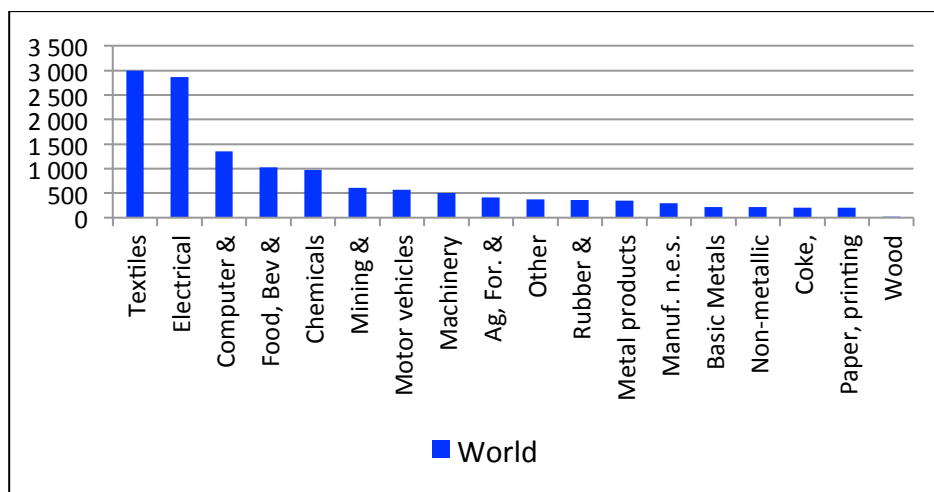
Source: UN Comtrade, using Tradesift

The chart above gives Tunisian export to the World in 2016, in 1000$s for the 18 sectors in the partial equilibrium model. Two sectors stand out as being significantly the most important export sectors and these are Textiles and Electrical Machinery.

Chart.8: Share of Tunisian exports going to the EU (2016)
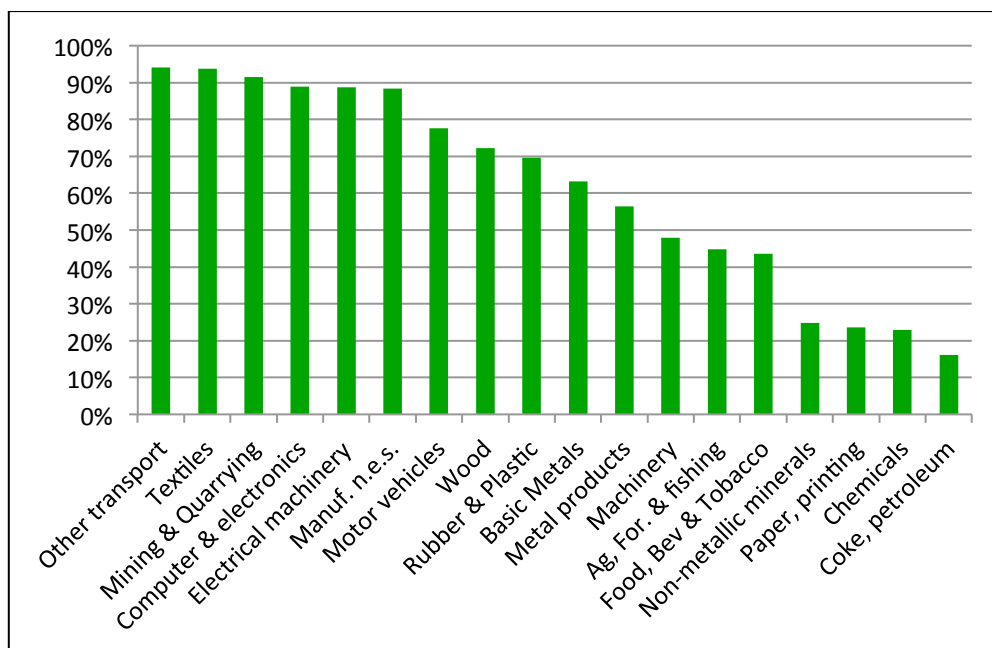
Once again, the importance of the EU as a destination market can be seen in the second chart above which for each sector gives the share of Tunisian exports which are destined for the EU market. From this we can see that for six of the 18 sectors more than 80% of Tunisia exports go to the EU, and for seven sectors the EU share is less than 50%. This confirms at the sectoral level what we previously saw at the aggregate level – namely the importance of the EU as a partner country with regard to Tunisia's exports.

The aggregate data, suggested that while the Barcelona process may have been instrumental in a general decline in Tunisian tariffs, it may not have had that big an impact on bilateral trade between the EU and Tunisia. However, one has to be careful in drawing too strong conclusions of this nature from aggregate trade flow statistics. To see this, we turn to a more disaggregated analysis.

Consider the chart below. Here we have looked at the change in the share of three SITC 1-digit sectors in Tunisia's exports to the EU. At the 1-digit level there are 10 sectors, so here we are looking at those which have seen the most significant changes since the early 1990s. We see that the share of fuel in exports to the EU fluctuates somewhat – no doubt in good part this may be driven by fluctuations in oil prices over time. Perhaps more interesting is the increase in the share of Machinery and Transport Equipment, from around 10% of Tunisia's exports to the EU to just under 45%. At the same time there has been a marked contraction in the importance of miscellaneous manufactured articles.

Chart.9: Share of selected SITC 1-digit sectors in Tunisian exports to the EU
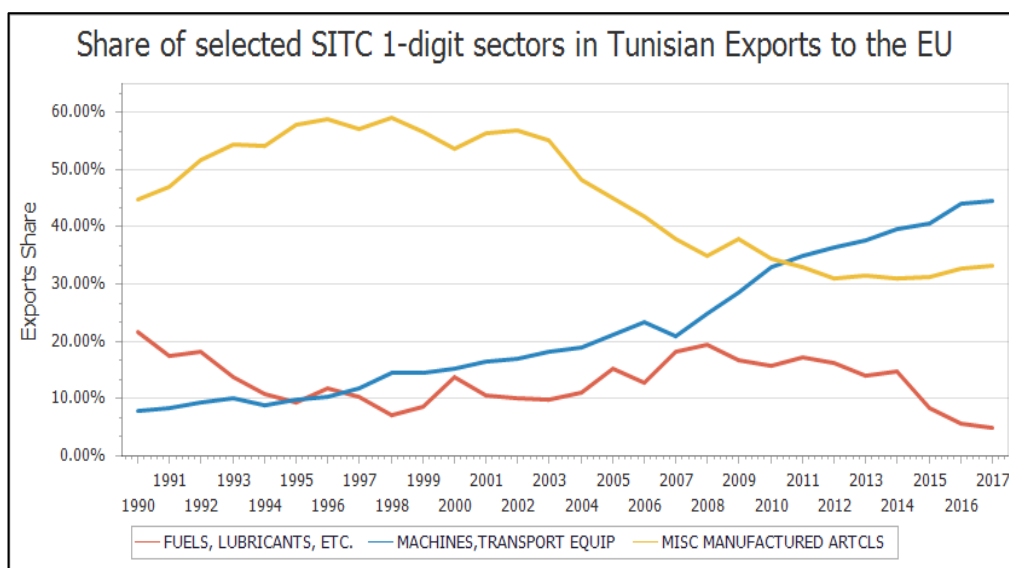
Source: UN Comtrade, using TradeSift

The next chart drills down deeper, and decomposes the changes in trade for Machinery and Transport Equipment into its component parts. At the SITC 2-digit level there are nine sub-sectors, and the chart below gives the share of each of these sub-sectors in Tunisian exports to the EU in 1995 and 2016. From this we see that each of these sub-sectors has become increasingly important in Tunisian exports to the EU, but the most changes have taken place with regard to electrical machinery, which has seen its share rise to above 25%.

Chart.10: Share of machinery in Tunisian exports to the EU
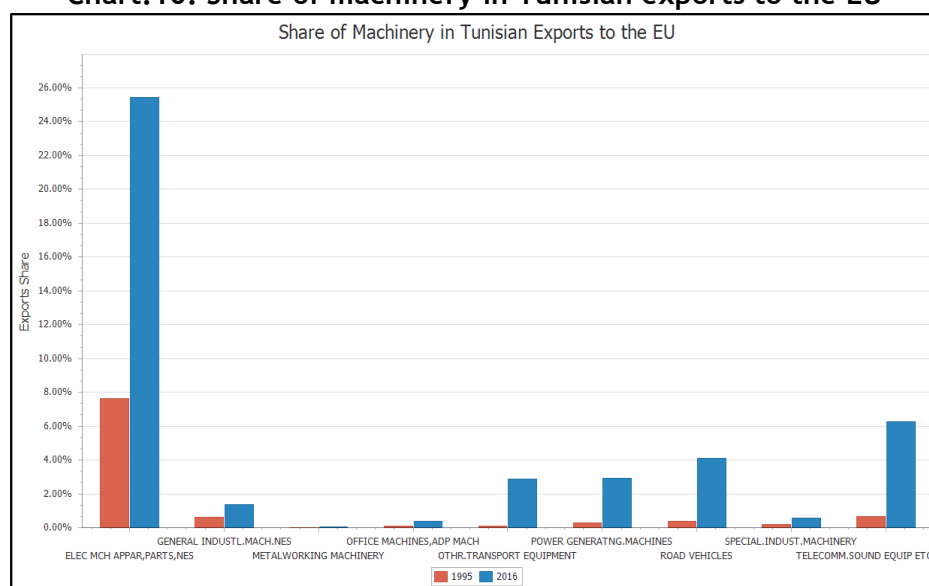
Source: UN Comtrade, using TradeSift

In turn that raises the question of the extent to which such changes may have been driven by the Association Agreement and by changes in access to the EU market. Prima facie, however, there is little to suggest that this may have been driven by tariff changes. The chart below, gives the tariffs applied by the EU on Tunisian exports in 1995 and 2016. Generally, we see many low tariffs even in 1995, and hence less scope for substantial liberalisation. This is not true of all sectors- as in agriculture fishing and textiles tariffs were higher, and to some extent still remain. Specifically, with regard to electrical machinery, EU tariffs even in 1995 were extremely low, so the growth in the exports of this sector does not appear to have been directly driven by improved access through lower tariffs to the EU market. Interestingly, however, as we saw earlier, electrical machinery is an industry which saw a substantial decline in Tunisian import tariffs. It is possible therefore that the reduction in import tariffs, combined with good access to the EU market may have enabled Tunisian producers to integrate more closely into EU value chains and hence increase their exports. Though more evidence on this would be needed to be sure about this explanation.

Chart.11: EU applied tariffs on Tunisia
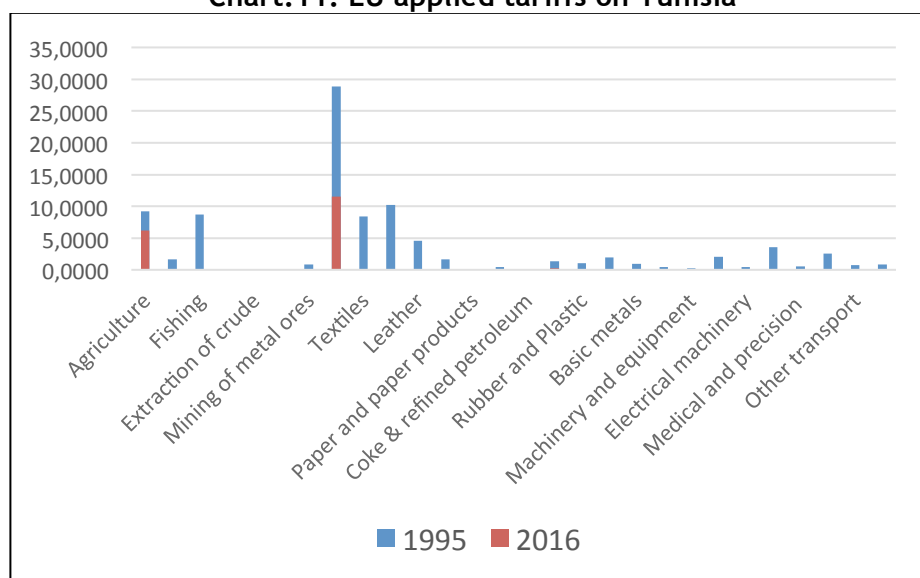
Source: UN Trains, using TradeSift

One way of trying to identify value chain engagement is to look at the level of intra-industry trade within a given industry. Depending on the nature of the value chain, essentially on the extent to which it is within-industry, then a rising level of intra-industry trade might be an indication of increased value chain engagement. Some information on this is provided in the chart below which gives the level of intra-industry trade (as measured by the Grubel-Lloyd index) between Tunisia and the EU in both 1995 and 2017, and once again for the Machinery and Transport Equipment sector. We see that in many of the sub-sectors there is indeed a substantial rise in intra-industry trade, which could be evidence of increased value chain engagement. Interestingly however, for electrical machinery we see a decline. This is evidence of increase niche specialisation. This could be enabled by increase imports in intermediate inputs from some of the other sub-categories and hence cross sub-sector value chain integration, but this cannot be determined from the data.

While the issue of upscaling dynamics in global value chains, may be part of the story, this also has to be considered also in the light of domestic policy initiative. For example, the growth of the mechanical and electrical industries sector and improved access to the EU market, in conjunction with increased Tunisian imports is also due to the application of the trade compensation mechanism. The trade compensation mechanism meant that the import of cars from the EU was conditioned by the export of spare parts to manufacturers, which allowed the development of the exports of the mechanical and electrical industries.

Chart.12: Intra-Industry trade between Tunisia and the EU
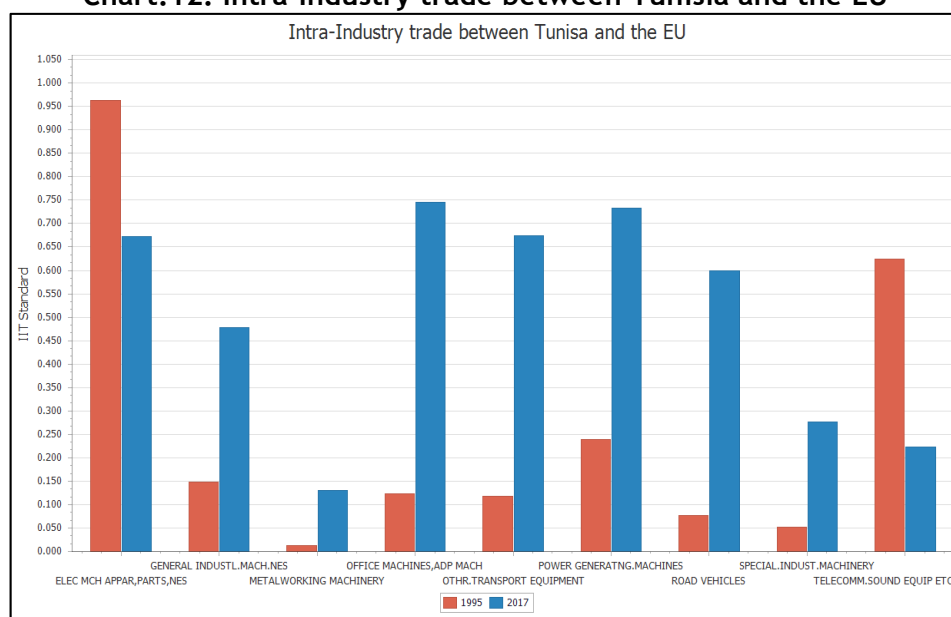
Source: UN Comtrade, calculated using TradeSift

There are several important conclusions to draw from the preceding discussion. The first, is that looking at aggregate trade data may be misleading and it is important to consider changes at a granular level. Second, and building on this – while at the aggregate level there is little evidence of closer integration between Tunisia and the EU, at the more disaggregated level it is clear that there have been significant changes in the pattern of trade. While we would expect that changes in trade costs, notably tariffs would play a part in this, there are many other factors over the 20-year time period discussed above which will also have impacted on the structure of Tunisian production and competitiveness. Trade is only ever a part of the story. It is important to bear this in mind in assessing the results of modelling exercises such as the results presented later on in this report. Such an exercise can shed light on the direct effects of changes in relative trade costs such as tariffs, but this does not therefore provide a prediction of the longer run changes in competitiveness and trade.

2. The existing literature

There is a broad literature on the European Neighbourhood Policy generally, and within that on the Eastern and Southern Partnerships. Inevitably there is a smaller amount of work with regard to individual countries, and in particular with regard to empirical estimates of the impact of changes in integration arrangements. With regard to the latter, the literature can be divided up between work which examines, ex post, what was the impact on trade arising from different forms of trade agreements; and empirical work which is ex ante, and attempts to simulate what might be the future impact of a change in policy. A good example of the former is the work of Montalbano and Nenci (2014), or Freund and Portugal-Perez (2013), and examples of the latter include Maliszewska et. al. (2009) who focus on the Eastern Partnership.

With regard to the EU-Tunisia DCFTA there is a limited amount of papers. A key contribution is the European Commission's Sustainability Impact Assessment, which covers a broad range of issues in its analysis. The EC's SIA is widely used in the negotiations and discussion by policy makers with regard to the proposed DCFTA. The economic analysis is based on a computable general equilibrium model, using the GTAP dataset, and consisting of 37 sectors/industries encompassing agriculture, manufacturing and services. The analysis assumes improvements in trade facilitation, liberalisation of agriculture and processed food products (that the EU will liberalise 95% of agricultural, processed agricultural and fisheries products, and Tunisia will liberalise 80%), reductions of non-tariff measures in services by 3% by the EU and 8% by Tunisia, as well as reductions in non-tariff measures for goods trade. The aggregate results suggest that overall impact for Tunisia could be an increase in GDP of up to 7% in the long run with Tunisian exports and imports increasing by 20% and 18% respectively. A large part of these gains come from the removal of non-tariff measures. It is worth noting that some of the sectoral results are perhaps counter-intuitive, such as the contraction of the Textile, Clothing and Leather sector. Curiously with regard to this, the authors state *"these results may not fully materialise as they partly stem from the general equilibrium nature of the model"*[4].

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[4] Trade Sustainability Impact Assessment in support of negotiations of a DCFTA between the EU and Tunisia, p.19.

Other than this SIA paper, the literature is very limited. Rau (2014) provides a GTAP based CGE analysis of the EU's DCFTA's with a range of countries, but works at a highly aggregated level (10 sectors), and provides little information on the results. The indicative results suggest a decrease in EU imports from Tunisia in Manufacturing and services, and an increase in Agriculture; and an increase in Tunisian imports from Morocco in all sectors, with the largest increase taking place in manufacturing. Using the same Magnet model, Ben Abdallah and alii (2013) also provide a CGE analysis for Egypt, Morocco and Tunisia where they focus on agriculture and food security. For Tunisia they find overall welfare gains of up to 5% of GDP, and with an increase in food production, for example, or up to 16% (depending on the scenario modelled)[5]. There is also other work such as by Houichi and Lakoud (2016), which focus on the impact of service liberalisation, and who find modest gains of less than 1% of GDP[6].

Much of the preceding and indeed the work we are proposing relies on estimates of non-tariff barriers to trade. These are notoriously hard to estimate especially at a detailed sectoral level. The key generic studies in this regard are Dean and alii (2009), Egger and alii (2015), Fontagne and alli (2011) and Berden (2009). There is then a literature which focuses more specifically on the Mediterranean countries which includes Augier, P (2012), and with regard to agricultural trade Tudela-Marco et.al (2014), work which is particularly important in the context of this proposed project.

2.1 The collateral effects of the AA

The reduction in tariffs as envisioned by the AA, in turn has an impact on tariff revenue, and hence government revenue. According to Reiffers, J.L, Ayari, C and Mouley (2016), the assessment of the tax gap for the Association Agreement consists of estimating customs duties in the absence of the agreement. These tariffs calculated (theoretically) are then compared to those observed to deduct the tax loss due to the agreement. As shown in the graph below, customs revenue declined from 1995 onward. They went from the equivalent of 4.6 percentage points of GDP in 1995 to almost one point of GDP in recent years.

Chart.12 : Evolution of customs revenue as a % of GDP
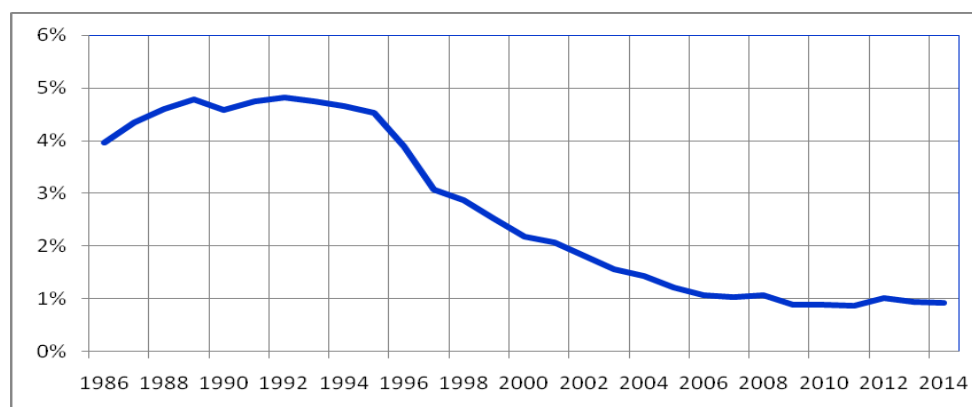
Source : Reiffers, J.L, Ayari, C et Mouley (2016)

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[5] See also Kavellari et.al (2013) for a parallel report using the same model.
[6] See also Dee and Diop (2010) and Ben Romdhane (2008).

This development is significant given the changes made in the tax system following the establishment of the 1995 agreement, and which has impacted significantly on the structure of tax revenues: customs duties have fallen from 22% to 4%, a decrease of about 18 percentage points. This decrease was offset by income tax, corporation tax and VAT. The simulations undertaken by Reiffers et.al (2016) performed by comparing actual and theoretical revenues in the absence of the agreement, show a significant and ever-increasing shortfall. The shortfall, as shown in the graph below, is about 2.9% of GDP per year on average since the entry into force of the agreement. This level remains quite high even if one takes into account the financial contribution granted by the EU to Tunisia via the MEDA, EIB and AFD programs.

Chart.13: Estimates of the tax loss foregone as a result of the AA
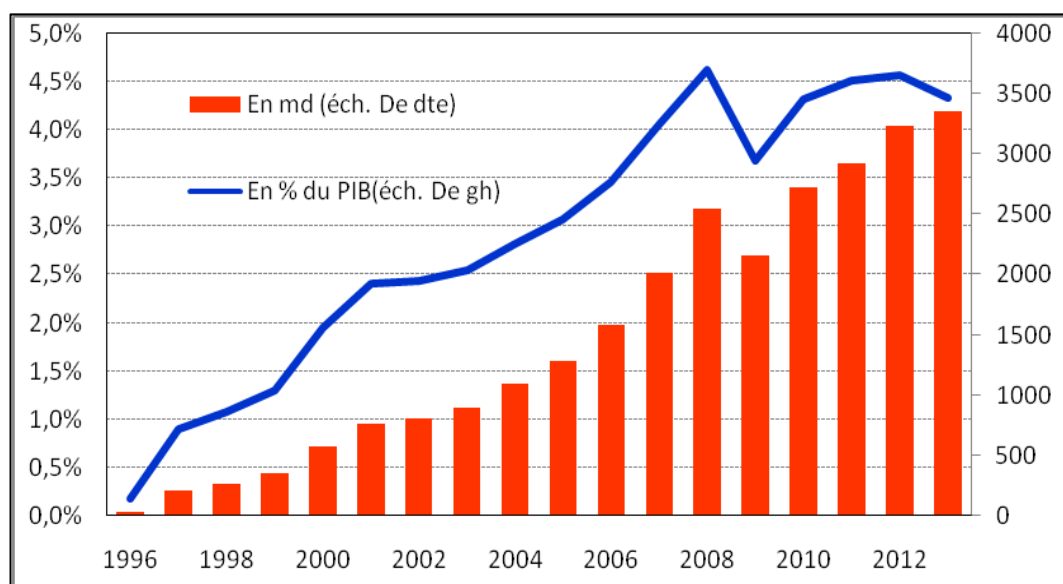
Source : Reiffers, J.L, Ayari, C et Mouley (2016)

Additionally, other work (see for example Mouley, S, 2017b) points out that the beneficial effects of the free-trade area, namely the attractiveness of Foreign Direct Investment (FDI) and the improvement of market shares, have also been offset by a series of negative effects, including the structural deficit of the trade balance and the polarization of the country's industrial fabric. Similarly, hoped for and anticipated, productivity gains have been relatively weak.

3. The partial equilibrium model

In this part of the report, as opposed to looking backwards at what occurred following the Association Agreement, the aim is to look forward and to consider what might be the impact of further trade liberalization with the EU as envisaged in the DCFTA.

Our analysis is based on a partial equilibrium (PE) model which allows for consideration of the impact of the DCFTA on prices, exports, imports and output in 18 manufacturing industries and six countries - Tunisia, the EU, Other Med countries, China, USA, World. In the rest of this section of the report we detail the data used and provide a summary description of the model.

Data:
For the model we require data on production in each country, and the bilateral trade of each country with each of the partners. We also need information on the applied tariffs between each pair of countries and on the level of non-tariff barriers. All this is with regard to the underlying data. Information is then also required with regard to the key parameters of the model. These are the elasticity of demand, the elasticity of substitution and the elasticity of supply.

Trade data:
2016 trade data is obtained from the OECD STAN Database, using Bilateral Trade in Goods by Industry and End-use (BTDIxE), ISIC Rev.4. The Rev.4 data is then manually converted to Rev. 3 in order to be compatible with the production data[7]. All data is taken from reporting countries import data, except for the world's imports (used to calculated RoW imports), which is calculated by using the mirror flow (i.e. all countries as reporters with the world as partner using export data).

Domestic consumption:
Domestic consumption (from domestic production) is calculated by production minus exports. For the production data, we used the ratio of production to exports from the OECD's TiVA data for 2011 in order to interpolate the 2016 levels of production.

Tariffs:
Sourced from the TRAINS data set (see Table.1 below). We use the average effectively applied (AHS) tariff rates which take into account the tariffs applied between countries with preferential agreements be they bilateral in the case of free trade areas, or unilateral in the case of schemes such as the Generalised System of Preferences (GSP). In the absence of preferential treatment, the AHS rates are the Most Favoured Nation (MFN) rates. In our analysis we use import-weighted average tariff rates.

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7 In this process, a few Rev.4 categories (09/58/33) are missing from the OECD database, in all occasions when the category is part of a group (e.g. the Rev.4 group D05T09 is converted to C10T14, with no 09 data included)

Non-tariff barriers:
Data on the appropriate levels of non-tariff measures is very hard to obtain. Whereas the data on tariffs is given in each country's tariff schedules, this does not apply to non-tariff barriers. However, because of the growing recognition of the importance of non-tariff barriers on trade flows, there has been increasing interests among trade economists and policy makers in their measurement (Berden and François, 2015). The typical approach amounts to calculating the ad-valorem equivalent. This can be thought of as the hypothetical tariff that would generate an equivalent reduction in imports.

The econometric quantification of NTM equivalents for different countries and industries is complex, and there is considerable variation in estimates reported across different studies. In this paper we make use of the NTM equivalents estimated by Cadot and Gourdon (2016). We use these estimates partly because they are based on the most recent data. As Cadot and Gourdon (2016) note, their estimates lie within a single-digit range and are somewhat lower than previous estimates based on older data. A further advantage is that these estimates distinguish between the size of the NTM barriers between countries that are part of a regional trade agreement (RTA) and those that are not.

In this paper, therefore we set the base level of NTMs at the lower level where there is a free trade agreement between countries, and at the higher level where there is no FTA. Hence, between the EU and Tunisia we set the NTMs at the lower level in the base. Because of the greater integration between EU countries we assume that the NTMs within the EU are equal to zero. In the DCFTA experiment, we reduce the NTMs between the EU and Tunisia to zero. We recognize that this is almost certainly unrealistic, and so these simulations should be thought of as providing an outer bound.

Parameters of the model:
The model also requires estimates of the elasticity of substitution between different varieties of the same product, the elasticity of demand for each product in aggregate, and the elasticity of supply[8]. There is a lack secondary empirical data with regard to the elasticity of substitution between goods from different sources. For homogenous goods industries, we therefore set the value of substitution elasticity at 6. For differentiated-goods industries, we set the value of substitution elasticity at 3. These values tie in with a simple average substitution elasticity of 4 for 3-digit HTS goods for 1990-2001 derived by Broda and Weinstein (2006).

For the elasticities of import demand, we use the work of Ghodsi et al. (2016b), who compute importer-specific import demand elasticities for 167 countries and 5124 commodities at the 6-digit level of the HS-1996, for the period 1996-2014. We aggregate these elasticities to the ISIC level of used in our model.

For the Armington version of the model, we also need to specify supply elasticities. Although some partial equilibrium models adopt the simplification that

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[8] For the demand elasticities see Table.1 below.

supply elasticities are infinite (Hallren and Riker, 2017), this will depend on the characteristics of the industry in question. We assume a high but finite supply elasticity, with a value set at 6 for domestic suppliers to domestic market (i.e. UK supplier to UK market, EU27 suppliers to EU27 market, etc.) and at 15 for other suppliers.

The table below summarizes the elasticities and the levels of tariffs and NTMs used in this paper. Several interesting features emerge from this table. First, and not surprisingly, we see that EU tariffs on Tunisian imports are in most cases zero, however, there are some remaining tariffs in agriculture, forestry and fishing, and also in food, beverages and tobacco. Perhaps more surprising is the average level of tariffs applied by Tunisia on imports from the EU, even though there has been an Association Agreement and free trade area in place since the late 1990s. Indeed, we see that the effectively applied tariffs remain quite high in most sectors, and are particularly high in agriculture, forestry and fishing, as well as in food, beverages and tobacco.

Table.1: Summary Model statistics

Description	Demand elasticity	Sub elasticity	high NTM	low NTM	EU tariffs on Tunisia	Tunisia Tariffs on EU
Ag, Forestry & fishing	1	6	20.8	16.4	5.5	27.8
Mining & Quarrying	1	6	9.4	6.8	0	3.9
Food, Bev. & Tobacco	0.99	6	17.3	12.6	11.6	32.8
Textiles	0.94	6	5.6	4.3	0	15.4
Wood	1.006	6	6.5	5.7	0	14.1
Paper, printing	0.92	6	3.3	2.1	0	13.9
Coke, petroleum	1.03	6	9.4	6.8	0	0.7
Chemicals	0.95	3	7.9	5.4	0.21	2.9
Rubber & Plastic	0.92	3	7	5	0	15.4
Non-metallic minerals	0.98	6	6.4	5.1	0	12.7
Basic Metals	0.96	6	5.8	3.9	0	4.2
Metal products	0.9	3	5.8	3.9	0	11.2
Machinery	0.86	3	6.7	4.8	0	4.5
Computer & electronics	0.8	3	6.7	4.8	0	0.2
Electrical machinery	0.83	3	6.7	4.8	0	10.0
Motor vehicles	0.87	3	9.3	7.9	0	15.1
Other transport	0.77	3	9.3	7.9	0	6.4
Manufacturing. n.e.s.	0.83	6	5.5	3.9	0	12.0

Source: See discussion in the text

The model:

In this paper we apply two (related) partial equilibrium models in which each of the sectors is treated as independent of the others. Both models use variants of a two-stage Dixit-Stiglitz constant elasticity of substitution demand system for differentiated products.

Overall demand for the sector's product in a particular national market is represented by the output index *(X)*, which is assumed to be a constant elasticity of substitution (CES) function of the sales of different varieties of the product, *(xᵢ)*:

$$X = \left(\sum_{i=1}^{n} a_i^{\frac{1}{\sigma}} x_i^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{\sigma-1}} \tag{1}$$

where the individual *(xᵢ)* represent the quantities of the different varieties of the good, the *(aᵢ)* are parameters which sum to 1, and *(X)* is the quantity index that aggregates the different varieties. If variety *(i)* is sold at price *(pᵢ)*, it can be shown that the demand functions for individual varieties are given by:

$$\frac{x_i}{X} = a_i \left(\frac{p_i}{P} \right)^{-\sigma} \tag{2}$$

where *(P)* is the price index for the product given by the CES function:

$$P = \left(\sum_{i=1}^{n} a_i p_i^{1-\sigma} \right)^{\frac{1}{1-\sigma}} \tag{3}$$

which measures the aggregate cost of the goods which constitute *(X)*, so the value of total spending in this market is:

$$\sum_{i=1}^{n} p_i x_i = PX \tag{4}$$

If it is assumed that overall demand *(X)* is a constant elasticity function of the price index *(P)* with elasticity –*μ*, then the own-price and cross-price elasticities of demand can be derived from (2) and (3) as:

$$\epsilon_{ii} = -\sigma + (\sigma - \eta)s_i \tag{5}$$

$$\epsilon_{ji} = (\sigma - \eta)s_i \tag{6}$$

where *sᵢ* = *pᵢ.xᵢ/PX* is the share of variety *(i)* in sales of the product in this market, noting that, because cross-price effects enter only through the price index, the cross-price elasticity depends on the market share of the variety whose price is changing, not on the characteristics of the product whose demand is changing as a result.

First model: Armington

In the first model using this structure, we suppose that goods are differentiated only by country of origin and are sold in perfectly competitive markets. This is the Armington model (Armington, 1969), with six countries in our model there are six varieties of the product sold in each of the six national markets. This means that products are differentiated only by place of production (consumers treat all Tunisian olive oil as homogenous but Tunisia olive oil is different from Moroccan), so that the product varieties produced in different countries are imperfect substitutes for each other.

In this variant of the model we assume perfect competition so individual firms do not have market power and price is equal to marginal cost. Supply behavior is described by a standard upward sloping supply function, hence we are assuming that there are decreasing returns on a market-by-market basis: marginal cost in each market rises with sales in that market but is unaffected by sales in other markets. The decreasing returns are at a mild rate: the assumed elasticity of supply is high.

In each country market, (5) relates the elasticity of demand for imports from each country source (and for the home-produced variety) to the underlying elasticities and to market shares. It is easily seen that the same equation gives the overall elasticity of import demand, i.e. the response to an equi-proportionate increase in all import prices is given by (5) where the share is the market share of all imports.

Second model: Imperfect competition

The second version of the model (referred to as ICF below) is based on Krugman's (1979, 1980, 1981) model of trade under imperfect competition, and our partial equilibrium application builds on the work of Smith and Venables (1988). The model assumes each industry produces differentiated products under conditions of increasing returns to scale.

Modelling of demand follows Dixit and Stiglitz (1977), with constant elasticity demand functions for individual products. This means consumers have a 'love of variety' in any one product: wine drinkers like wine from different Spanish producers, and also wine from different French producers; and demand for an individual variety depends on its price relative to an aggregate product price index. Demand for the aggregate product is a function of the aggregate price index.

In this version of the model, products are differentiated by producing firm, so firms have some market power. The imperfect substitutability of different firms' varieties gives rise to imperfect competition, in which firms have market power and set prices above marginal cost. Now (5) determines the elasticity which enters firms pricing decisions. However, the relationship needs careful interpretation. Even though we are working with a somewhat disaggregated classification of manufactures, from the perspective of competition between product varieties the classification is too aggregate: a typical sector should be thought of as consisting of several sub-sectors each of which produces a distinct set of product varieties.

Increasing returns mean that growth in a firm's sales in one market reduces its cost of production and leads to expansion in other markets too. Markets are segmented and firms act as Bertrand competitors, setting prices in each market to maximize profits taking competitors' prices as given. The number of firms in each country are constant. In one version of the imperfect competition model, we assume that firms have constant marginal cost, so the only source of economies of scale comes from the spreading of fixed cost over a larger output. In a second version, the one used to generate the main results in the paper, we assume that firms' marginal cost decreases with output, so there is a second source of scale economies. This gives rise to a multi-market linkage: if a firm expands its sales in one market, its marginal cost falls and therefore in all other markets its price falls and its sales expand.

Because we use partial equilibrium analysis, our results should not be seen as making 'predictions' about the precise sectoral effects of the DCFTA. The actual effects will depend in good part on the changes in policy which we model, but in addition on structural factors which are not captured by the model, on the second-order adjustments in factor markets and markets for intermediates, on other policy changes and shocks which cannot be predicted, as well as on longer run changes in investment.[9] Our modelling aims to provide a consistent framework for evaluating orders of magnitude of the direct effects on manufacturing from different possible scenarios. This enables comparison across industries and sectors and across scenarios of the extent to which the different industries and sectors may respond to the changes in trade costs implied by the DCFTA.

4. Results

In this section of the report we summarize the key results obtained from the simulations. We first provide the aggregate results across the different experiments, and then secondly, we consider the more detailed sectoral results.

In the charts below we give the results for Tunisian output and exports for three experiments: (a) tariffs reductions only; (b) NTM reductions only; (c) tariffs and NTM reductions combined. The intention is to separate out the effects of changes in tariffs from changes in NTMS, and then to see the aggregate effects. For each of these experiments we report on three different variants. The first bar in the charts below gives the results arising from the standard Armington model. The second and third bars are both based on the imperfectly competitive version of our model. The difference between the two concerns the assumption we make regarding the underlying firm level economies of scale. In the experiment entitled ICF1, we assume that there are no firm level economies of scale. In ICF2, we set the elasticity of scale equal to 5%. Hence a 10% increase in output would lead to a 5% decrease in costs.

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[9] As partial equilibrium models do not capture labour market and product market linkages, they should be seen as providing shorter run evaluations of the possible direction and relative magnitudes of changes in trade and production.

Chart.14: Impacts of tariffs reductions only on output and exports
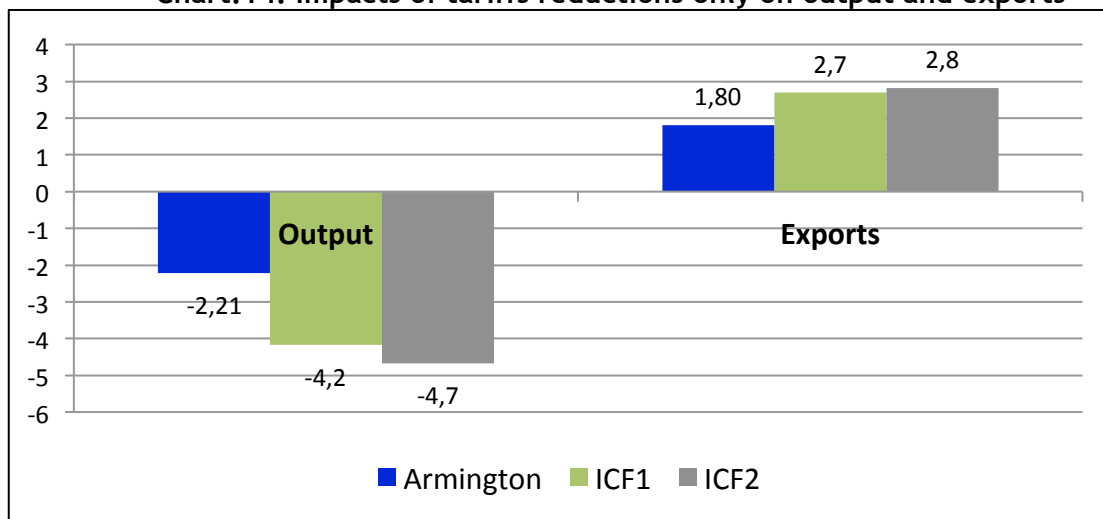
Source: Own calculations

Chart.15: Impacts of NTMs reductions only on output and exports
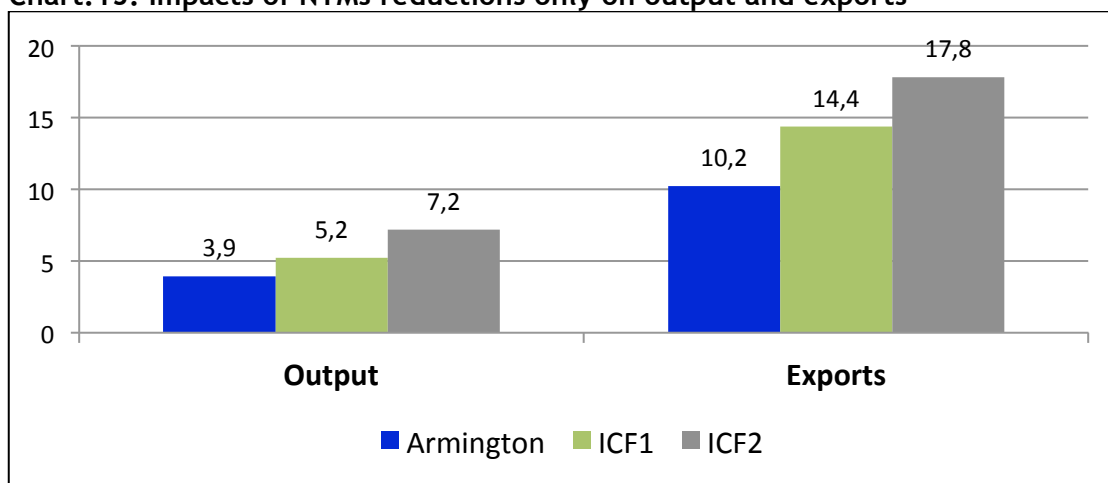
Source: Own calculations

Chart.16: Impacts of tariffs and NTMs reductions combined on output and exports
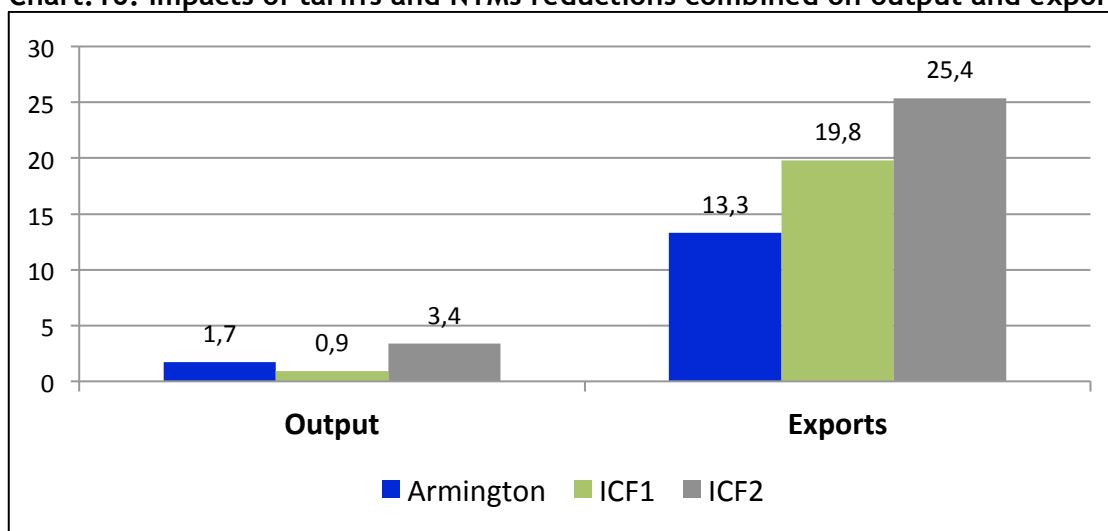
Source: Own calculations

If we consider first the changes in tariffs between the EU and Tunisia, we see that in all variants of the model abolishing all tariffs between the two partners would result in a reduction in Tunisian output (ranging between 2,2% and 4,7%), slightly offset by an increase in Tunisian exports by up to 2,8%. Generally, economists argue that liberalizing trade has positive economic effects, yet here we find reductions in output, so how can this be reconciled? In the first place, it is important to note that the conclusion that trade has a positive economic effect is with regard to economic welfare – and in this we need to take into account the impact not just on producers (output) but also consumers. Lowering tariffs, lowers domestic prices which benefits all consumers and firms buying intermediate inputs. Simply assessing the output changes does not address this.

In the second instance, and related to the first, it is important to recall the channels through which trade can be beneficial. Broadly speaking, there are four such channels. The first is that trade can lead to gains from specialization based on comparative advantage. The second, is that trade can lead to within-industry reallocation, where more efficient firms tend to survive and expand, where less efficient firms tend to contract or exit, all of which leads to aggregate productivity gains. The third, is that trade is likely to lead to increase in the productivity of firms – through technology transfer, economies of scale, access to improved intermediates, R&D etc. The fourth, is that trade may encourage the agglomeration of production (possibly linked to value chain integration) and there may be positive spillover effects from that agglomeration.

These are important and powerful effects, but many of these are also complex long-run effects which economic models can only capture to a limited degree. Take for example the changes in specialization on the basis of comparative advantage. In the long run, this occurs because resources are withdrawn from some sector and reallocated to other sectors as the process of specialization occurs. These are general equilibrium changes, mediated by changes in technology and investment which are not captured in a partial equilibrium model. Similarly, the changes in within-industry reallocations, or changes in agglomeration are not well captured in PE and CGE models. It is in this sense that such models should not be seen as giving predictions.

What then do we learn from such a modeling exercise? There are two important categories of messages that emerge. The first is that such a model is good at identifying the direct, short run impacts of changes in policy, where in the short run factor markets, investment changes, technology changes have not occurred. Second, the models are very helpful in identifying how the differential short run impact across different sectors or industries. In the case of Tunisia, the changes in tariffs implied by the DCFTA are highly asymmetric. They are asymmetric across industries because of the different existing levels of tariffs; they are also asymmetric between the EU and Tunisia. EU tariffs are largely close to zero, Tunisian tariffs remain high. So, the process of liberalization involves Tunisia liberalizing tariffs considerably more than the EU. This involves opening up its market to EU imports, which has a direct affect on production in the industries – and it is this which is driving the changes in output. A useful way of thinking about this is that the model is good at identifying which industries may be vulnerable to the changes in tariffs implied by the DCFTA.

It is for these reasons also that when we consider the NTM only experiment (middle chart) we see an increase in output for Tunisia ranging from 3,9% to over 7%. These are potentially substantial changes, and in part driven by changes in exports which could be as high as nearly 18%. Once again this is driven by the changes in trade costs implied by the experiment. There is now a much greater relative improvement in Tunisian access to the EU market from the reductions in non-tariff barriers – this leads to increases in exports and output, which offset the decreases implied by the tariff only experiment.

Not surprisingly therefore the net effect when we allow for both tariffs and NTMs, in particular on output is more muted. The simulations suggest that the net increase in output could be up to 3,4%.

The preceding focused on the aggregate results. These will, of course, be driven by the changes in imports, exports and output at the individual sectoral level. Those changes in turn will depend on the size of the trade costs reductions (be these tariffs or NTMs) across the sectors (as given in Table.1 above), but also on the underlying structure of trade and the relative importance of the EU in Tunisian demand and in Tunisian supply.

That underlying structure of trade, production and consumption can be seen in the Table 2 below. The first column considers the importance of the EU as a supplier to Tunisia. We see for example that only 5,3% of domestic consumption of agriculture comes from EU imports. In contrast nearly 70% of Tunisian purchases of rubber and plastic come from the EU. The second column focuses on Tunisian imports only and details the share of the EU in Tunisian imports. For example, 58% of Tunisian imports of Manufacturing n.e.s. come from the EU, but the overall share of the EU in domestic sales is relatively low at 12%. The 3rd and 4th columns provide analogous information for Tunisian production and exports. Hence, we see that 3,4% of total Tunisian sales of Agriculture, Forestry and Fishing are destined for the EU market, and this is presumably because most output is sold domestically. Conversely over 80% of other transport equipment is destined for the EU. The final column focuses on Tunisian exports, and considers the share of the EU in those exports. This is analogous to Chart.2 earlier and reveals the importance of the EU as a destination market. For example, nearly 90% of Tunisian exports of textiles are destined for the EU.

Table.2: Importance of the EU in Tunisian trade, production and consumption

	Share of EU in Tunisian domestic market	share of EU in Tunisian imports	Share of EU in Tunisian total sales	share of EU in Tunisian exports
Ag, For. & fishing	5.3	28.7	3.4	49.4
Mining & Quarrying	8.1	8.1	74.4	74.5
Food, Bev. & Tobacco	29.6	29.8	48.6	48.9
Textiles	29.1	64.8	45.6	87.1
Wood	15.9	78.6	2.9	81.7
Paper, printing	28.7	59.8	7.0	21.7
Coke, petroleum	35.9	36.0	46.2	47.2
Chemicals	29.1	56.3	7.5	22.4
Rubber & Plastic	67.5	73.3	63.1	77.1
Non-metallic minerals	5.2	59.5	2.1	22.5
Basic Metals	43.0	59.2	10.6	30.8
Metal products	17.6	62.8	12.3	63.4
Machinery	51.5	59.6	27.5	42.4
Computer & electronics	26.0	30.3	66.7	80.4
Electrical machinery	39.7	67.1	37.1	49.5
Motor vehicles	23.4	63.1	10.8	70.1
Other transport	53.9	68.3	82.8	94.5
Manuf. n.e.s.	12.0	58.0	20.2	84.1

Source: Base dataset

The next table gives the simulated change in prices, output, and exports across the 18 simulated sectors. Here, we report on the results for the Armington experiment and the imperfectly competitive sectors experiment with firm level economies of scale (ICF2). It is important to consider the price changes because as discussed earlier this is an important element of the overall welfare effects from trade liberalization. From these columns we see that prices decline in all sectors, and most notably in food, beverages and tobacco, and in rubber and plastic. The price changes are slightly greater in the ICF2 experiment, and this is because the changes in trade lead to a decline in price-cost markups. These changes in prices are important in generating welfare gains for households and final goods consumers, as well as for firms buying intermediate inputs.

Perhaps not surprisingly, all industries see an increase in exports – this derives from the increased access to the EU market from the lowering of non-tariff barriers, and the largest increases are in those sectors where those initial barriers are highest. The increase in exports is not sufficient to lead to an increase in output, as the process of domestic liberalization impacts on imports and hence Tunisian domestic sales.

<table>
<tr><th colspan="7">Table.3: Tunisia - % changes in Prices, Output and Exports</th></tr>
</table>

	Price index		Output (Q)		Exports (V)	
	ARM	ICF2	ARM	ICF2	ARM	ICF2
Ag, For. & fishing	-4.1	-5.1	-4.9	-11.8	50.9	83.7
Mining & Quarrying	-0.9	-1.2	24.2	36.4	19.7	28.9
Food, Bev. & Tobacco	-14.7	-16.9	73.4	129.6	56.4	93.7
Textiles	-6.6	-6.7	1.4	0.0	14.1	20.3
Wood	-4.1	-4.3	-8.9	-15.1	17.9	26.1
Paper, printing	-5.3	-5.3	-8.0	-14.1	1.7	2.4
Coke, petroleum	-2.6	-2.8	14.9	22.9	12.5	18.4
Chemicals	-2.4	-2.4	-1.1	-1.7	2.1	2.6
Rubber & Plastic	-11.7	-12.0	5.3	5.6	6.5	7.9
Non-metallic minerals	-1.3	-1.5	-2.5	-4.5	4.4	6.3
Basic Metals	-3.5	-3.5	-3.8	-7.8	4.5	6.5
Metal products	-2.8	-2.9	-1.9	-2.5	4.2	5.0
Machinery	-4.5	-4.5	1.2	0.8	3.4	4.2
Computer & electronics	-1.3	-1.3	8.0	9.6	6.5	7.9
Electrical machinery	-5.7	-5.7	2.6	2.9	4.0	4.9
Motor vehicles	-5.5	-5.6	-4.3	-5.9	9.5	11.5
Other transport	-7.2	-7.1	16.0	19.2	12.7	15.5
Manuf. n.e.s.	-2.6	-2.6	-1.3	-3.0	12.3	17.7

Source: own calculations

If we turn to the output changes, we see a mixed pattern of results. Half of the sectors see a decline in output with the biggest declines (in rank order) in wood products, paper and printing, agriculture, forestry and fishing, basic metals, manuf. n.e.s, non-metallic minerals, metal products, motor vehicles and chemicals.

In particular, the agricultural sector may appear to face some difficulties as a result of further liberalization, which may be compounded by difficulties in improving its productivity. Production, which is often subject to climatic hazards, often fails to cover EU-imposed quotas. This is all the more true as Tunisia does not often have exportable surpluses in fruits and vegetables (European imports represent only about 6% of the total of the sector) and it is clearly importing cereals (Tunisia imports about 50% of its cereal requirements). That is why one objective is to expand agricultural production in sectors having a comparative advantage, such as organic agriculture. This will also requires the Tunisian side to make more efforts to ensure the expansion of certain products (such as the tomato sector in Morocco) which has been able to secure a favorable position on the European market. In this respect, it is important to focus on products for which Tunisia has an exportable surplus and where it is likely that there is a potential European demand,

Out of the industries that see an increase in output the sector with the biggest changes is food beverages and tobacco. The simulated change in output is as high as 130% in the case of ICF2, with a 93% increase in exports. The key driving factor behind these large changes is that this is a sector both with very high initial tariffs and high non-tariff barriers to trade. The increased access to the EU markets expands Tunisian production which makes it more competitive at home and abroad.

5. Conclusions

In this report we have explored the implications of deeper liberalization between the EU and Tunisia under the auspices of a deep and comprehensive free trade agreement – DCFTA. Important in understanding those consequences is to assess the existing trade patterns between the EU and Tunisia and the impact of the preceding Association Agreement.

Hence the first part of this report considered a range of descriptive statistics designed to shed light on whether the Association Agreement impacted positively on Tunisian trade. The prima facie evidence is that there is comparatively little evidence of much impact arising from the Association Agreement, perhaps reflected in the declining share of the EU in both Tunisian imports and exports. In support of this argument we also showed that despite what was envisioned in the AA, Tunisian tariff on EU manufactured imports remain, and in some cases are quite significant. Importantly also, the AA did not envisage much liberalisation of non-tariff measures / barriers to trade, and excluded agriculture.

However, this argument needs to be tempered by the fact that there is no clear counterfactual. The changes in Tunisian trade flows that occurred were not simply driven by possible change in Tunisian import tariffs from the EU, but also by the tariffs that Tunisia levied and faced with regard to the rest of the world. The changes will also have been driven by the change in the competitiveness of other countries over this time period, and where those changes in competitiveness. In 1995 China was Tunisia's 21st most important supplier of imports and accounted for 0.7% of imports, similarly Turkey was the 14th most important and accounted for 1.34% of imports. By 2017, China was the third most important importer accounting for 8.9% of imports and Turkey was the 5th and accounting for 4.6% of imports. These changes in Tunisian imports were driven by the changes in these countries' worldwide competitiveness, and by the fact that as well as liberalising with the EU, Tunisia also liberalised its MFN tariffs.

It is hard therefore to unpick the impact of the AA from looking at past trends and solely from looking at those trends at an aggregate level. Our discussion therefore also focussed on a more disaggregated level and identified that while, in aggregate, there appeared to have been little impact of the AA, for certain sectors, such as electrical machinery one can find prima facie evidence of impact.

The advantage of a partial equilibrium simulation models, is that it is possible to focus narrowly on the changes in relative prices that would be implied by changes in tariffs and non-tariff barriers. Hence in the second part of this report we apply a state of the art partial equilibrium model, which allows for economies of scale and imperfect competition to provide some illustrative results of a furthering of integration between the EU and Tunisia via a DCFTA. Such a model should not be seen as providing a forecast or prediction of the effects precisely because such a model does not take into account other changes that might occur contemporaneously – such as changes in Chinese or Turkish competitiveness. Instead such a model should be seen as indicating which sectors are most likely to be affected by a deepening of integration, and what the impacts on prices, output, and trade might be.

Some key conclusions which emerge from the analysis are: First, that further reductions in tariffs only are likely to put more strain on the adjustment process in Tunisia. A shallow level of integration (i.e. focused on tariffs) puts much more of the burden of the liberalisation on Tunisia, because the EU's has already liberalised its tariffs. Indeed such an experiment leads to a decline in Tunisia output. However there are potential significant gains for Tunisia if the DCFTA succeeds in significantly reducing non-tariff barriers between the EU and Tunisia. Our results here have to be caveated by the fact that good information on the ad valorem equivalents of NTMs does not exist. We use the best available estimates, but there is a wide margin of error even in these. Hence, we find that there is potential for net gains in Tunisian output and exports (up to 3.4% and 25.4% respectively in our simulations). However not all industries expand. Indeed we find that half of the modelled industries expand while the other half contract.

From a policy perspective, what do we conclude from these results: The opening up of markets leads to opportunities and to the possibility of net welfare gains. This result is well established from international trade theory and from a wide range of empirical evidence. There are many sources of these gains, but only some of which are accounted for in a modelling framework such as the one we have used. The extent of the gains will depend critically both on the level of non-tariff barriers between the EU and Tunisia and on the extent of any reductions in both tariff and non-tariff barriers. It is therefore extremely important that more work is undertaken to better understand the extent of these barriers and what specific policies are needed to ensure their removal.

We also realise that the results presented here, might lead some to argue that an appropriate policy response for Tunisia would be to minimise any further liberalisation of its tariffs (so as to protect domestic industry), while obtaining maximum non-tariff barrier reductions into the EU market so as to encourage exports. This would be a mistake. Protecting industries is distortionary and is not good for the long run growth of the economy. Indeed most of the gain from international trade come from the improved allocation of resources from domestic liberalisation. Hence domestic liberalisation is also important, but of course needs to be done gradually and with the appropriate policies in place to deal with any adjustment costs. However, increasing exports is also important and can also lead to important gains, and therefore improved overseas market access should also be a policy priority.

As alluded to above, liberalisation also leads to winners and losers and we see this in the distribution of changes across industries in our results. Typically the winners are the consumers and purchasers of intermediate inputs who now get these at lower prices, and the workers in the expanding industries. The losers are the firms, and the workers in those firms who face increased competition from abroad.These adjustment costs, and the length of time it takes individuals, firms, and sectors to adjust should not be underestimated. Hence in parallel with any process of deeper liberalisation it is important that there are policies facilitating structural industrial change and adjustment assistance to those most negative impacted.

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