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Estimates of trade-related adjustment costs in Syria☆

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Abstract

The scope and complexity of international trading arrangements in the Middle East, as well as their spotty historical record of success, underscore the urgent need for an adequate understanding of the relative costs and benefits of participation in preferential trading arrangements and, more generally, of changes in the domestic import regimes. This paper seeks to address this problem by providing estimates of the adjustment costs associated with two broad classes of hypothetical trade policy scenarios for Syria: participation in the proposed EU-Syria Association Agreement, and border tax-related changes affecting the domestic import regime. We find that the revenue consequences of the first scenario are likely to be low if an appropriate stepwise implementation of the agreement can be ensured; our analysis of the second scenario suggests that all border taxes can be eliminated, and the number of tariff bands reduced, while ensuring revenue neutrality, if a VAT of a reasonable size is introduced.

JEL classification: F14; O24; P33

Keywords: Trade policy; Trade adjustment costs; Tariff reform; Syria

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1. Introduction

The history of regional and international integration in the Arab world is replete with examples of unrealized aspirations toward greater trading flows. Beginning with early intra-regional attempts at organizing transit trade in 1953, to the Agreement on the Arab Common Market in 1964, to the Agreement on the facilitation and promotion of intra-Arab trade in 1981, tangible results from these agreements have remained somewhat elusive (Romagnoli & Mengoni, 2009). The Greater Arab Free Trade Area (GAFTA), which came into full force in January 2005, appears to demonstrate some initial promise in boosting trade flows (Abedini & Péridy, 2008), but a full accounting of its true impact remains to be done.

These attempts at trade promotion have also been accompanied by an ever-increasing proliferation of regional economic blocs, such as the Arab Maghreb Union, the Gulf Cooperation Council, the Council of Arab Economic Unity, and the Arab League,[1] not to mention inter-regional bodies such as the Euro-Mediterranean Partnership and the Organisation of The Islamic Conference. These arrangements generally declare, *inter alia*, trade enhancement as an objective in their texts and charters. The success of these blocs in meeting this particular objective, however, remains uncertain.

The scope and complexity of these international trading arrangements—coupled with their spotty historical record of success—underscores the urgent need for an adequate understanding of the relative costs and benefits of participation in preferential trading arrangements and, more generally, of changes in the domestic import regime. Such an understanding can be important in tempering any ambivalence due to uncertainty about trade outcomes arising from reform, and can be useful in helping design mitigation mechanisms and adaptation strategies.

This paper provides estimates of the adjustment costs associated with several hypothesized changes in trade policy for Syria. It employs a partial equilibrium model[2] of domestic demand for imports to generate estimates of the trade flow and fiscal revenue implications for two broad classes of hypothetical scenarios: (a) participation in preferential trading arrangements (PTAs), in particular the to-be-implemented Association Agreement between the European Union and Syria (EUSAA); and (b) changes to the domestic import regime, including the introduction of a value added tax (VAT, currently being considered by the Ministry of Finance), a reduction in the number of non-zero tariff bands, and the elimination of the convoluted system of municipal border taxes. Finally, we propose a comprehensive reform that targets all of these challenges jointly.

We implement our policy simulations with the Tariff Reform Impact Simulation Tool (TRIST), developed at the World Bank. The model is based on a representative consumer with Armington (1969)-style preferences, who makes choices over traded goods, taking into account substitution

[1] The first comprising the North African states of Algeria, Libya, Mauritania, Morocco, and Tunisia; the second link the oil-producing states of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and United Arab Emirates; the third is composed of the Gulf and Maghreb Union countries (except Mauritania) plus Egypt, Sudan, Yemen, and the Mashreq countries (Lebanon, Jordan, Syria, and the West Bank); and the last group adds Comoros, Djibouti, Mauritania, Somalia, and Sudan.

[2] There are several reasons why a partial equilibrium analysis is reasonably warranted in the Syrian context. First, little is known about the production structure of the Syrian economy, with data for the production side of the economy relatively scarce and potentially unreliable. Second, the observed pattern of export diversification over the past decade has changed rapidly, suggesting that the production structure of the economy is in a state of flux; this likewise points to focusing on the action on the demand side. Third, the partial equilibrium model used is transparent and replicable, which encourages Syrian officials to adapt the model to run policy-relevant simulations of their own.

and demand effects due to price changes (Brenton, Saborowski, Staritz, & von Uexkull, 2009).[3] A similar setup has been widely adopted in applied trade models, such as single- or multi-country computable general equilibrium (CGE) models.

We find that the revenue consequences of the first scenario can be substantial, and that an informed choice of an exclusion list for the agreement may not only significantly lower the revenue impact, but may also markedly influence the relative vulnerability of different sectors. We show that a proper sequencing of the reform that ensures a manageable impact on revenues requires close attention to the fact that the Syrian import regime levies "nuisance tariffs" on almost 60% of tariff lines.[4] Naturally, the final liberalization step will have a revenue impact that is perhaps larger than expected.

Our analysis of the second scenario suggests that the number of tariff bands can be reduced to a lower number, while ensuring revenue neutrality. The driving factor behind the impact of such a reform is once again the decision how to deal with the high number of nuisance rates. Both an elimination of all these tariffs and an increase of all rates to 5% will trigger a revenue impact of a large magnitude. We further show that the elimination of additional import taxes is a realistic option, fiscally speaking. More specifically, revenue neutrality can be attained by concurrently implementing a VAT of sufficient but reasonable size.

The trade policy literature identifies three main barriers to tariff reform. There may be concern about the fiscal implications of reform, especially with regard to lost revenue (Mitra, 1992). Uncertainty over the beneficiaries of tariff reform may also ingrain the *status quo* Fernández and Rodrik (1991). Finally, political economy factors—such as lobbying by special interests (Grossman & Helpman, 1994) or particularistic tariff preferences of the median voter (Mayer, 1984)—may also lead to resistance against tariff changes in specific sectors. By quantifying the fiscal impact of trade adjustment, this paper aims to directly address the first and second channels by which trade reform may be delayed; our clear accounting of the adjustment costs associated with tariff reform can also inform key stakeholders and improve the outcomes that result from political-economic activity (the third channel).

The literature on trade reform in Syria is relatively thin. Chemingui and Dessus (2008) utilize a computable general equilibrium (CGE) model to assess the costs of nontariff barriers in Syria, and estimate that the effective protection afforded by such technical barriers to trade amount to more than twice that of tariffs. However, many of the policy proposals considered in their paper have already come to pass, and their study is, in any case, focused on the costs of nontariff rather than explicit tariff barriers. Gaitán and Lucke (2007) conduct policy experiments along similar lines using a dynamic CGE model, with a stronger focus on PTAs. Unlike this paper, their analysis is focused on examining changes in macroeconomic aggregates as well as output at the sectoral level, rather than fiscal considerations.[5] There is also a small literature that examines the effects of free trade agreements on countries in the region. Abedini and Péridy (2008) apply a modified

[3] Unfortunately, data limitations mean that the model that we eventually apply does not admit the second effect; that is, the substitution between imports and domestically produced goods is perfectly inelastic.

[4] Nuisance tariffs are defined by the WTO as tariffs that are so low that the administrative costs of collecting them are higher than the revenue they generate. There is no definitive level at which a tariff becomes a nuisance. A small tariff on a good that is imported in regular quantities by a small number of importers may generate more revenue than it costs, as is the case for crude oil. For simplicity, this study refers to all tariffs below 5% as nuisance tariffs. This does not change the fact, however, that it is important to investigate each nuisance tariff on a case-by-case basis in order to be able to determine whether it should be eliminated or not.

[5] A working paper version (Lucke, 2001) does examine fiscal consequences in greater detail, especially in relation to macro variables such as the government deficit and the current account balance.

gravity model to study the effect of GAFTA within the region more broadly. Others have also performed country-level analyses of the possible effects of an FTA with the EU, using Jordanian (Hosoe, 2001) and Turkish (Atici & Kennedy, 2005) data. However, the former two papers are concerned more with realized trade flows, not adjustment or fiscal costs, and the latter paper deals mainly with income distribution issues.

The paper is organized as follows. Following this introduction, we sketch the model (Section 2) that underlies our the simulation results (Section 3), which include the broad scenarios outlined above. This is followed by reflections on the appropriate policy mix for further consolidating import liberalization in Syria (Section 4), before a final section concludes.

2. A simple model of tradable goods demand

Consider an economic environment comprised of goods indexed by $i = 1, \ldots, n$ varieties originating from countries indexed by $j = 1, \ldots, m$. Let a small, open economy be comprised of a single representative consumer possessing standard Armington (1969)-type preferences given by[6]

$$U(\mathbf{x}, \mathbf{x}^*) = U(\mathbf{x}_1, \ldots, \mathbf{x}_n, \mathbf{x}_1^*, \ldots, \mathbf{x}_n^*), \tag{1}$$

where $\mathbf{x}_i^* = [x_{i1}^* \cdots x_{im}^*]$ is the vector of imports of a given good i from each of the m countries, and $\mathbf{x}_i = [x_{i1} \cdots x_{im}]$ is the vector of analogous goods produced at home. For simplicity, we follow the literature and assume that (1) is homogeneously separable in the n goods, so that we can rewrite this as

$$U(\mathbf{x}) = V(v_1(\mathbf{x}_1, \mathbf{x}_1^*), \ldots, v_n(\mathbf{x}_n, \mathbf{x}_n^*)),$$

where $v_i(\mathbf{x}_i, \mathbf{x}_i^*)$ are indexes of consumption of each type of good (both home and foreign, respectively). These indexes further nest sub-indexes of goods among competing producers, which are weakly separable between home and foreign goods:

$$v_i(\mathbf{x}_i, \mathbf{x}_i^*) = W(w_i(\mathbf{x}_i), w_i(\mathbf{x}_i^*)),$$

as well as (weakly separable) sub-indexes of goods between competing national exporters:

$$w_i(\mathbf{x}_i^*) \equiv w(x_{i1}^*, \ldots, x_{im}^*).$$

We make the further assumption that both the top-level utility function $V(\cdot)$ and the second-level sub-utility functions $v_i(\cdot)$ and $w_i(\cdot)$ possess a constant elasticity of substitution (CES) form, so we can write a given (representative) sub-utility function as

$$w_i(\mathbf{x}_i^*) = w[\beta_{i1}(x_{i1}^*)^{-\rho} + \cdots + \beta_{im}(x_{im}^*)^{-\rho}]^{-\frac{1}{\rho}},$$

where $\sum_m \beta_i = 1$ and $\rho > -1$. The consumer faces a vector of corresponding prices $\mathbf{p} = [p_{11} \cdots p_{1m} \cdots p_{n1} \cdots p_{nm}]$, and will maximize (1) subject to the budget constraint $\mathbf{p}\mathbf{x}' = \mathbf{y}$, where

[6] The limitations of imposing Armington-type preferences on consumers are well documented (Lloyd & Zhang, 2006). For our purposes of analyzing scenarios associated with trade policy changes, however, two concerns are relevant: First, that the monopoly power associated with each exporting country overstates the terms of trade effects of tariff elimination, and second, that the absence of product variety changes understates welfare gains. We address the first concern directly, by providing sensitivity analyses for the preference parameters that we assume. We address the second issue somewhat indirectly, by focusing on the trade flow and trade revenue effects, rather than welfare effects, of the different scenarios.

y is national income. Armington (1969) shows that this leads to standard CES-style product demand functions

$$x_{ij} = \beta_{ij}^{\sigma^{ES}} x_i \left(\frac{p_{ij}}{p_i} \right)^{-\sigma^{ES}},$$

where x_i and p_i are indexes of goods and prices, respectively, and $\sigma^{ES} \equiv 1/1 + \rho$ is the elasticity of substitution between different exporters of a given product. The formulation of this demand function shows how the substitution of products in consumer demand works in this class of models: the Armington model treats substitution between products as imperfect (and as dependent on the substitution elasticity). Analogous demand functions can be derived for the total demand for good i, X_i^{TD}, which is a function of the relative price of good i and the price elasticity of demand, σ^P, as well as for the demand for imports relative to domestic production.

Taking the model discussed above as its theoretical foundation, the empirical model that we take to the data makes some further assumptions: it normalizes the world market price of each product to unity and models its market separately from all other products.[7] A product's price is thus equal to one plus any tariff and import charges levied on it at the border. We further assume that any changes in tariffs and charges are perfectly passed through to the final consumer.

On the basis of this Armington (1969)-style model, price changes impact demand for a product from a given supplier through three channels: through an exporter substitution effect, which is the consumption response to relative price changes between different national suppliers; through a demand—or income—effect, as consumption of a product changes in response to a change in its overall price; and through a domestic substitution effect (which due to data limitations we do not capture). For our purposes, then, the strength of the first two effects is determined by the vector $[\sigma^P \sigma^{ES}]$ of elasticity parameters. The precise calculation steps have been documented in Brenton et al. (2009) and are, for completeness, reproduced in the technical appendix.

Finally, implicit in our empirical model is at least one additional technical assumption: since demand responses are based on elasticities, there will never be market entry by new exporters as a result of price changes (zero trade flows will always remain unchanged at zero).

This paper extends the standard TRIST model described in Brenton et al. (2009) in two ways. First, we advance the static simulations associated with a single year to include sequential simulations that take into account multi-year tariff liberalization scenarios. Second, we include scenarios that allow for variations in other categories of border-related charges, such as the spending tax and the revenue tax, as well as the implementation of a VAT.

3. Analysis of trade-related adjustment costs

3.1. Description of data

We use proprietary data provided by Syrian Customs, collected via the newly implemented Automated System for Customs Data (ASYCUDA) system, for Syrian customs posts employing the system over the period between January and end-July 2009. The dataset comprises information on all import transactions at the 8-digit harmonized system (HS) level, including information on

[7] Products are differentiated at the tariff line level. The assumption could pose a problem if, for example, consumers routinely substitute coffee for tea when their relative prices change. We do not regard this as a major concern, since such substitution between distinctly different products typically occur only in cases where the price changes are fairly large, while the price effects of most trade policy changes are generally more modest.

trading partners, c.i.f. import values, collected tariff revenue and tariff exemptions, as well as all additional charges applied at the border. The data also include information on customs procedure codes (CPC), which allow us to exclude imports from the data set that do not enter the Syrian market for the sole purpose of private domestic consumption.[8]

ASYCUDA has, to date, only been partially implemented. According to the Customs directorate, the system covered 75% of all Syrian imports in January 2009. This share has been steadily increasing since, reaching 85% in June 2009, and is expected to have attained almost full coverage (98%) by the end of 2009. For the purpose of this study, this data limitation is not unproblematic. However, Syrian customs authorities have verified that the data present a fairly representative sample of imports across products and trading partners.[9]

The dataset comprises Syrian imports on a total of 3183 tariff lines and 126 trading partners. The total value of imports amounts to SYP 607.3 billion. On these imports, SYP 39.3 billion worth of tariff revenue and SYP 66.8 billion worth of overall trade tax revenue (including tariff revenue) were collected. Collected tariff revenue thus makes up 58.9% of overall trade tax revenue. The statutory tariff rate across all tariff lines, calculated as a simple average, is 11.1% (the import-weighted average is 7.0%). The equivalent numbers for the collected tariff rate are 10.7% and 6.5%, respectively. These figures suggest that tariff exemptions granted at the Syrian border are substantial, although not excessively large compared with other middle income economies. A simple simulation using the model described in Section 2 shows that a trade reform that eliminates all tariff exemptions would increase Syrian tariff revenue by about SYP 2.6 billion, which is equivalent to 6.5% of the current total.[10]

Table 1 illustrates how tariffs are distributed across tariff bands for trading partners with whom Syria is currently not involved in a preferential trade agreement.[11] The table differentiates 11 tariff bands that correspond to the 11 actual bands in the Syrian tariff schedule (0%, 1%, 3%, 5%, 7%, 10%, 15%, 20%, 30%, 40%, 50%, and 60%). As can be seen, the distribution of statutory tariffs is highly skewed. Almost 60% of tariff lines are subject to nuisance tariffs (tariffs of 5% or below). These account for more about 70% of imports and 27% of total revenues. The remaining tariff lines are relatively evenly distributed across the rest of the tariff bands.

Collected tariff rates are only slightly more skewed towards the lower end of the distribution than statutory rates. Although tariff exemptions seem limited in magnitude, the data reveal that, taking them into account, 1.3% of tariff lines are subject to tariffs close to zero, whereas only 0.1% (two lines) are subject to statutory tariffs within the same band. Overall, the table highlights the fact that, for any effective reform of the Syrian trade regime, it will be crucial to pay close attention to products on which nuisance tariffs are levied, as this is where a large share of the burden of tariff collection ultimately falls.

As a check for the consistency of the dataset with other published trade data, we compare the 10 most important import partners and products (by 3-digit ISIC code) for 2007 and 2009 (Table 2), using UN COMTRADE data for 2007 against Customs' ASYCUDA data for 2009. The data exhibit

[8] These include, for example, goods in transit, government imports, and goods destined for warehousing.

[9] It is possible to make simple extrapolations, based on our knowledge of the extent of coverage across time, in order to recover reasonable numbers that are applicable at the national level for the full calendar year. More specifically, given the preceding discussion, we suggest a multiplication factor close to two for all numbers not expressed in percentage terms.

[10] As will become clear, our explicit accounting for tariff exemptions is central to our study of fiscal costs. The importance of the careful treatment of import concessions for studies analyzing trade policy changes is a general point that has been previously emphasized by Ianchovichina (2004).

[11] Notice that this implies that the total of 2895 tariff lines is lower in this table than the total across all countries (3183 tariff lines) including those in preferential trade agreements with Syria.

Table 1
Distribution of tariff lines by bands, Syria, 2009. [a]

	Statutory tariff				Collected tariff			
Bands	Lines	Share of total (%)	Share of imports (%)	Share of revenue (%)	Lines	Share of total (%)	Share of imports (%)	Share of revenue (%)
0–0.5	2	0.1	0.0	0.0	39	1.3	2.4	0.1
0.5–2	1087	37.5	47.8	10.5	1080	37.3	46.0	10.5
2–5	649	22.4	23.6	17.3	641	22.1	23.4	17.3
5–8	68	2.3	3.9	3.5	70	2.4	3.9	3.5
8.5–12.5	252	8.7	5.0	6.2	252	8.7	5.0	6.3
12.5–17.5	147	5.1	4.9	7.5	146	5.0	4.9	7.6
17.5–25	138	4.8	1.9	4.3	136	4.7	1.8	4.2
25–35	149	5.1	0.9	2.9	142	4.9	0.8	2.9
35–45	73	2.5	8.4	29.5	72	2.5	8.2	29.7
45–55	327	11.3	1.2	5.4	314	10.8	1.1	5.2
55–60	3	0.1	2.5	12.9	3	0.1	2.5	12.9

[a] Intervals chosen to be broadly reflective of 10 actual Syrian tariff bands, and ranges are given with upper (but not lower) bound inclusive. Statutory and collected rates can differ from actual bands defined by Syrian customs authorities because averages are computed across all trading partner groups, which may include countries exempt from a given tariff.

a significant degree of overlap. 7 of the top 10 partners (8 if we allow the fact that EU imports are mainly from Italy) are common across the two years, as are 7 of the top 10 products. China, the EU, Turkey, and Arab countries such as Egypt and Saudi Arabia are, unsurprisingly, among Syria's most important trading partners.

One important complication that needs to be addressed in any study of the Syrian import regime is the enormous number of nontariff charges applied at the border. In addition to a spending tax and a revenue tax, there are in the excess of a hundred other possible additional charges. This is complicated by the fact that some charges, including both fees and taxes, are levied on the import declaration, while others are levied on the imported item—with complicated rules for what constitutes the appropriate base for each charge.[12] In the simulations that follow, we focus on the three major revenue-generating sources—tariffs, the spending tax, and the revenue tax—and aggregate all additional charges into an "all other charges" category, in order to maintain transparency.[13]

Finally, to keep the presentation clean, we also aggregate import values and trade tax revenues across four trading partner groups, consistent with their importance within the Syrian import regime. These are Turkey, GAFTA, the EU, and the Rest of the World (ROW).[14]

3.2. Trade policy scenarios

We apply the model described in Section 2 to two broad classes of policy scenarios: (a) participation in PTAs; and (b) changes in the domestic import regime. We illustrate the first

[12] Given that the latter charges are of a small magnitude, we simplify by distributing them evenly across items in a given declaration.

[13] In the Syrian customs regime, tariff revenue is calculated as a percentage of the c.i.f. import value, and both the spending and the revenue tax are calculated as a percentage of the tariff inclusive import value. Some of the other taxes and charges are weighted averages of various different tax bases. For simplicity, we treat the aggregative all other charges category as a percentage of the c.i.f. import value only.

[14] The results presented in the subsequent section are, however, not sensitive to a change in the number of country groupings used.

Table 2
Comparison of top 10 trading partners and import products, Syria, 2007 and 2009. [a]

Partners				**Products**					
2009		2007		2009			2007		
Country	Share (%)	Country	Share (%)	ISIC	Product	Share (%)	ISIC	Product	Share (%)
China	9.6	**Russia**	9.8	11	**Crops**	18.1	232	Refined petroleum	31.7
Egypt	8.4	**China**	8.0	241	**Chemicals**	13.9	271	**Iron and steel**	10.7
South Korea	8.1	Italy	6.9	341	**Motor vehicles**	10.2	241	**Chemicals**	8.0
Saudi Arabia	6.4	**Ukraine**	5.8	271	**Iron and steel**	6.1	341	**Motor vehicles**	6.5
Turkey	6.3	**Saudi Arabia**	5.7	242	**Other chemicals**	5.6	11	**Crops**	4.7
EU	6.2	Malta	5.5	292	**Special machinery**	4.7	154	Other food	3.2
Ukraine	6.1	**South Korea**	5.0	151	Processed food	4.0	291	**General machinery**	3.1
Russia	3.3	**Egypt**	4.6	153	Grain mill products	3.1	272	Metals	3.0
Germany	3.1	**Turkey**	4.4	269	Non-metallic minerals	3.0	242	**Other chemicals**	3.0
Jordan	2.5	India	3.9	291	**General machinery**	2.9	292	**Special machinery**	2.2

[a] 2007 data are from the UN COMTRADE database, while 2009 data are from Syrian Customs' ASYCUDA database. Countries or products in bold are common across both years. Shares are calculated as shares of total imports. Note that trade partners for 2007 and 2009 are not directly comparable for the EU, because 2007 data disaggregate the EU countries but 2009 data treat the EU as a single entity.

scenario by considering both the static as well as sequential effects of the forthcoming EUSAA. We conceive of the second as a rationalization of border charges that simplifies the number of tariff bands, together with the concurrent introduction of a VAT coupled with the elimination of other trade taxes. We close the subsection with two hypothetical comprehensive reform scenarios that target all these changes simultaneously.[15]

In all our baseline scenarios, the simulation assumes model elasticity parameters that equal to $\sigma^P = 1.5$ and $\sigma^{ES} = 0.5$ (default elasticities). These elasticities are fairly standard in the literature, although we recognize that country- and time-specific idiosyncrasies may call for variations to this default. Accordingly, in our robustness checks (Section 3.4), we allow these parameters to systematically vary, and consider the sensitivity of our findings to variations in these parameters.

3.2.1. Participation in preferential trade agreements

The two PTAs that are currently of greatest relevance to Syria are the Syria-Turkey bilateral and GAFTA. Syria has also (re)initialed the EUSAA in December 2008, and the agreement is currently awaiting ratification in the European Parliament, as well as final signatures from both parties. Given the importance of the European Union as a trading partner for the Syrian economy,[16] the trade and revenue consequences of the agreement are of major concern to Syrian policymakers.[17]

The EUSAA is to operate following a schedule that sequences in the reforms over a period of 12 years. As a benchmark, however, we first consider a single-phased agreement (Table 3), with three alternative degrees of residual protection, as represented by the coverage of the exclusion list: (a) no exclusion list (column 1); (b) 10 percent exclusion (column 2); and (c) 20 percent exclusion (column 3), with the specific items on the exclusion list chosen to minimize the revenue impact of the agreement.[18]

The first three rows of Table 3 report the impact of the reform scenario on total imports, while the next blocks of information illustrate the impact on tariff revenue, total revenue generated on imports, and collected tariff rates. The figures reported in the first column of the table suggest that the EUSAA, if implemented in its most radical form, may lead to considerable losses in Syrian revenues. The complete elimination of tariffs on EU products is projected to lead to a 24.3% decline in tariff revenue, with total trade tax revenues falling by 14.7% and the average import weighted collected tariff rate dropping by 1.6 percentage points to 4.9%. The second and third columns of the table do show, however, that the impact of the agreement is likely to be attenuated significantly by determining a list of products to be excluded from liberalization. Depending on

[15] All reform options are analyzed with an eye on identifying the core factors that determine whether revenue neutrality is attained. Given the relative simplicity of our methodology, however, we tend to discount the specific numerical values of the estimates and refrain from making precise projections of the likely impact of the reforms. We instead concentrate on the qualitative implications, especially with regard to substantial differences in estimated magnitudes.

[16] Although the share of the EU in total trade with Syria is not as large as that of several other partners, Syrian policymakers regard the EU as a key partner due to the region's geographical proximity as well as its potential as a major market for Syrian exports.

[17] Indeed, Syria cited uncertainty about the impact of the agreement on the Syrian economy as a justification for delaying the signing till the start of 2010.

[18] According to WTO rules, preferential trade agreements must be characterized by a reciprocal rather than a unilateral reduction in tariffs. Article 24 of the General Agreement on Tariffs and Trade (GATT), however, emphasizes that certain sectors can be excluded from liberalization by calling for a liberalization of "substantially all trade" only. This clause is commonly interpreted as demanding a liberalization of at least 80% of all trade between the parties to the agreement. In principle, the countries involved are free to choose the 20% of trade for which tariffs are to be left unchanged.

Table 3
Static trade impact of a single-phased Association Agreement with the EU. [a]

	No exclusion list	10% exclusion list	20% exclusion list
	Impact on imports		
Imports pre	607.3 [b]	607.3	607.3
Imports post	611.1	609.0	608.7
Change (%)	0.6	0.3	0.2
	Impact on revenue		
Tariff revenue pre	39.3	39.3	39.3
Tariff revenue post	29.8	36.0	37.2
Change (%)	−24.3	−8.6	−5.3
	Total import tax revenue		
Total revenue pre	66.8	66.8	66.8
Total revenue post	57.0	63.3	64.6
Change (%)	−14.7	−5.1	−3.2
	Collected tariff rates		
Tariff rate pre	6.5	6.5	6.5
Tariff rate post	4.9	5.9	6.1
Change (%)	−24.8	−8.8	−5.5

[a] Scenarios simulated assuming elasticity parameters of $\sigma^P = 0.5$ and $\sigma^{ES} = 1.5$. Exclusion lists were selected to minimize revenue impact. All tariffs on EU imports not on the EU exclusion list are set to zero.
[b] All values are given in billions of SYP.

the size of the exclusion list, our model projects a reduction in total revenues from import taxes of between 3.2–5.1%. Given that an appropriate sequencing of the reform may allow these losses to be spread out over the course of a 20-year period, we do not regard these losses as excessive.

Irrespective of the revenue implications of the agreement, the fall in prices of imported goods in response to tariff liberalization is advantageous for consumers to the extent that these tariffs are not protecting significant amounts of production and employment.[19] It is therefore helpful to examine the sectors and subsectors that will experience the largest price changes as a result of the EUSAA.

Recall, in our model, the implementation of the EUSAA impacts import prices through two channels: first, directly via the reduction in tariffs (affecting demand); and second, indirectly via the change in the share of EU-sourced imports in overall imports of the product (affecting exporter substitution). The impact of the EUSAA, as measured by these changes in protection and import prices, is highly asymmetric. Table 4 lists the 20 (ISIC) subsectors that will experience the largest product price declines as a result of the EUSAA, and also aggregates this information for each ISIC 1-digit sector. The calculations for this exercise are performed for the "no exclusion list" (upper panel) and "20 percent exclusion list" (lower panel) scenarios. The results indicate that the extent to which subsectors are impacted by the agreement in terms of changes in protection and import prices is extremely heterogeneous across subsectors. For example, whereas subsector 742 (architectural, engineering and other technical activities) experiences a reduction in protection from 30% to zero and an average import price decline of about 34.6% when no exclusion list is used, most other subsectors are affected only marginally.

[19] If sufficiently detailed sectoral production data was available, it would be straightforward to determine likely changes in employment and production in response to the reform, but that exercise would take us beyond the scope of this paper.

Table 4
Largest changes in protection and prices due to the EUSAA, by both sector and subsector. [a]

ISIC	Sector	Protection change (%)	Price change (%)
Without exclusion list			
A	Agriculture	−8.9	−0.3
B	Fishing	0.0	0.0
C	Mining and quarrying	−44.1	−0.6
D	Manufacturing	−27.4	−1.5
E	Utilities	0.0	0.0
F–Q	Services	−6.0	−0.1
742	Architectural	−100.0	−34.6
181	Apparel	−38.6	−11.9
342	Motor vehicle bodies	−73.3	−11.8
314	Accumulators and cells	−48.6	−10.4
192	Footwear	−26.1	−7.7
322	Tele/radio transmitters	−88.2	−6.9
343	Motor vehicle parts	−50.1	−6.4
12	Animal farming	−97.1	−5.8
341	Motor vehicles	−24.4	−5.1
332	Optical instruments	−45.2	−3.8
191	Leather	−17.7	−3.8
293	Domestic appliances	−18.0	−3.1
331	Medical appliances	−55.0	−2.7
221	Publishing	−86.3	−2.6
313	Wire and cable	−69.0	−2.5
242	Other chemicals	−70.5	−2.3
173	Knitted fabrics	−15.1	−1.8
289	Other fabricated metal	−33.3	−1.7
323	Tele/radio receivers	−10.2	−1.7
361	Furniture	−11.7	−1.7
With 20% exclusion list			
A	Agriculture	−2.9	−0.1
B	Fishing	0.0	0.0
C	Mining and quarrying	−42.2	−0.6
D	Manufacturing	−5.6	−0.4
E	Utilities	0.0	0.0
F–Q	Services	−0.6	0.0
12	Animal farming	−94.6	−5.6
221	Publishing	−83.6	−2.5
331	Medical instruments	−46.6	−2.3
322	Tele/radio transmitters	−20.8	−1.7
101	Coal mining	−100.0	−1.5
103	Peat extraction	−100.0	−1.5
352	Locomotives	−66.4	−1.4
242	Other chemicals	−40.8	−1.4
289	Other fabricated metal	−17.9	−1.0
172	Other textiles	−16.6	−0.9
142	Other mining	−74.4	−0.9
312	Electricity distribution	−34.9	−0.9
152	Dairy	−27.7	−0.8
313	Wire and cable	−17.2	−0.7
319	Other electrical	−11.9	−0.7
315	Lighting equipment	−8.7	−0.7
291	General purpose machinery	−19.9	−0.6

Table 4 (*Continued*)

ISIC	Sector	Protection change (%)	Price change (%)
252	Plastics	−20.2	−0.6
232	Refined petroleum	−56.3	−0.6
343	Motor vehicle parts	−3.9	−0.6

[a] For comparability, one-digit ISIC sectors are reported. Subsectors are chosen and ordered by those with the largest price changes, assuming elasticity parameters of $\sigma^P = 0.5$, $\sigma^{DS} = 1.0$, and $\sigma^{ES} = 1.5$.

Table 5
Trade impact of a multi-phased Association Agreement with the EU. [a]

	20% cap	15% cap	10% cap	Zero tariffs
	Impact on imports			
Imports pre	607.3 [b]	608.4	609.2	609.9
Imports post	608.4	609.2	609.9	611.8
Change (%)	0.2	0.1	0.1	0.3
	Impact on revenue			
Tariff revenue pre	39.3	36.3	34.7	33.3
Tariff revenue post	36.3	34.7	33.3	29.5
Change (%)	−7.6	−5.6	−4.6	−11.6
	Total import tax revenue			
Total revenue pre	66.8	63.7	62.1	60.6
Total revenue post	63.7	62.1	60.6	56.8
Change (%)	−4.6	−3.3	−2.6	−6.5
	Collected tariff rates			
Tariff rate pre	6.5	6.0	5.7	5.5
Tariff rate post	6.0	5.7	5.5	4.8
Change (%)	−7.8	−5.7	−4.7	−11.8

[a] Sequencing of agreement implemented in 3-year liberalization steps, undertaken over 12 years, with indicated tariff caps applied on EU imports. Scenarios simulated assuming elasticity parameters of $\sigma^P = 0.5$ and $\sigma^{ES} = 1.5$, with no exclusion list.

[b] All values are given in billions of SYP.

Table 4 also shows that a given choice of exclusion list can greatly impact the relative vulnerability of different subsectors. To continue with our example, subsector 742 is not even among the 20 most affected sectors when the 20% exclusion list is used. Similarly, whereas sector D (manufacturing) experiences the largest import price change in the scenario without an exclusion list, it is much better shielded from the impact of reform when the 20% exclusion list is used; sector C (mining and quarrying) becomes the sector experiencing the largest reduction in import prices in the latter case.

We now consider the more realistic scenario of a sequential phased-in agreement (Table 5). We allow sequencing to occur over the 12-year period over 4 three-year liberalization steps. In the first step, tariffs on EU products are capped at 20%. The cap is reduced to 10% in the second step, 5% in the third, and in the final step, tariffs are eliminated completely.[20] We also assume the

[20] Since we assume that collected tariffs are capped at these thresholds, this also implies that the caps already take tariff exemptions into account.

Table 6
Designs on alternative tariff bands. [a]

	Option A	Option B	Option C
Old collected tariffs	*New collected tariffs*		
Tariff > 40	35	35	0
Tariff > 20 and ≤ 30	30	30	35
Tariff > 10 and ≤ 20	20	10	20
Tariff > 5 and ≤ 10	10	5	10
Tariff > 0 and ≤ 5	0	5	5
Tariff = 0	0	0	0

[a] Tariffs defined as collected tariffs, in percentage terms.

absence of an exclusion list at this point; the numbers shown should therefore be interpreted as an estimated upper bound on the projected impact of the agreement.

The aggregate impact of the sequential implementation of the EUSAA on tariff revenue and overall trade tax revenue is very similar to the impact of the static scenario discussed previously, although we would point out that the final liberalization step generates, by far, the largest losses in revenue: This step leads to a tariff revenue reduction of 11.6% and a trade tax revenue fall of 6.5%, with the average collected tariff rate falling from 5.5% to 4.9%.

3.2.2. Changes to the import regime

Having investigated the impact of the EUSAA, we now move to a broader analysis of the Syrian import regime which has undergone significant reform over the past decade. As a first step, we investigate the revenue implications of redesigning the tariff band structure. We assume that the new bands are defined in terms of statutory rates, with no tariff exemptions granted post-reform.[21] There are several options for tariff band structures that would reduce the number of tariff bands. We consider three possibilities. Our first approach collapses the existing bands into four bands by fixing all rates above 40% at 35%, all rates above 20% and below or equal 40% at 30%, raising bands above 10% (5%) and below or equal 20% (10%) to 20% (10%), and eliminating all nuisance tariffs completely; we denote this *Option A*. The second approach likewise introduces four bands. It differs from the first option only in its treatment of tariffs lesser than or equal 20%. More specifically, *Option B* fixes bands above 10% (5%) and below or equal 20% (10%) to 10% (5%) and increases all nuisance tariffs to 5%. A third approach is to eliminate all tariffs above 40% completely, to fix rates above 20% and below or equal 40% at 35% and to raise tariffs bands above 10% (5%; 0%) and below or equal 20% (10%; 5%) to their respective upper boundaries (*Option C*). We summarize the implications of these various reform options in Table 6.

The first column of Table 7 highlights the impact of reform *Option A* on Syrian trade revenues. The figures project large revenue losses—24.9% in terms of lost tariff revenue and 14.9% in terms of lost overall trade tax revenue—that would result from the reform. This is in sharp contrast to the findings for *Option B*, which is projected to have an almost revenue-neutral impact.

The highly differential impact of the two trade reform scenarios on revenues is striking, but there is a straightforward explanation which, once again, is due to the skewness of the distribution of pre-reform tariff bands towards low tariffs. Recall, the difference between the two reform

[21] Alternatively, depending on the likely volume of tariff exemptions, post-reform tariff bands could also be set higher to obtain the same revenue impact.

Table 7
Trade impact of various options for simplification of tariff regime. [a]

	Option A	Option B	Option C
	Impact on imports		
Imports pre	607.3 [b]	607.3	607.3
Imports post	611.5	606.0	604.9
Change (%)	0.7	−0.2	−0.4
	Impact on revenue		
Tariff revenue pre	39.3	39.3	39.3
Tariff revenue post	29.6	40.1	40.6
Change (%)	−24.9	1.8	3.1
	Total import tax revenue		
Total revenue pre	66.8	66.8	66.8
Total revenue post	56.8	67.4	67.8
Change (%)	−14.9	0.9	1.6
	Collected tariff rates		
Tariff rate pre	6.5	6.5	6.5
Tariff rate post	4.8	6.6	6.7
Change (%)	−25.4	2.0	3.5

[a] Scenarios simulated assuming elasticity parameters of $\sigma^P = 0.5$ and $\sigma^{ES} = 1.5$.
[b] All values are given in billions of SYP.

scenarios is the differential treatment of tariffs lower than or equal to 20%. Specifically, the design of *Option A* pushes the 10–20% bands to their upper limits (while simultaneously eliminating nuisance tariffs), whereas *Option B* fixes the 10–20% bands at their lower limits (while fixing nuisance rates at their upper bound). This means that the trade impact of *Option A* (*O* ption B) would be driven more by tariffs at or below 5% (between 10–20%). We see this consequence when we compare the first two columns of Table 7, which underscores how the tariff band structure is strongly influenced by the treatment of nuisance tariffs.

Finally, column 3 of Table 7 presents our model's projections for the impact of *Option C* on Syrian revenues. While the complete elimination of all tariffs above 40% is not, in general, a realistic or progressive one, the exercise is designed to stress the point that reducing (or totally eliminating) very high tariff rates would not necessarily be detrimental to revenues. Any incurred losses are easily offset by some minor adjustments to the remaining bands. Since high tariff rates are relatively infrequent, this is hardly surprising. Nonetheless, given how their removal may entail a major simplification of the tariff regime that is not accompanied by a disruptive surge in imports, a cut of the highest tariff rates should be high on the policy agenda.

We now turn to investigating reform strategies for reducing the excessive number of additional import charges applied at the border. We consider the impact of a reduction in the number of additional import charges on trade revenues, along with the effect of a concomitant implementation of a VAT to make up for projected revenue losses. In particular, we allow for six distinct reform scenarios: First, we eliminate all trade taxes with the exception of tariffs and the spending tax (*Reform A*); second, all trade taxes besides tariffs are eliminated (*Reform B*); third (fourth), the elimination of all trade taxes is coupled with the conversion of the spending tax into a 3% (5%) VAT on all products (*Reform C*; *Reform D*); and last, the elimination of all trade taxes is coupled with the conversion of the spending tax into a 10% (12%) VAT on all consumer and capital goods (*Reform E*) (*Reform F*). These simulations are reported in Table 8.

Table 8
Trade impact of various reforms involving simplification of border taxes with VAT introduction. [a]

	Reform A	Reform B	Reform C	Reform D	Reform E	Reform F
	Impact on imports					
Imports pre	607.3 [b]	607.3	607.3	607.3	607.3	607.3
Imports post	614.2	620.1	610.9	604.9	607.9	605.5
Change (%)	1.1	2.1	0.6	−0.4	0.1	−0.3
	Impact on revenue					
Tariff revenue pre	39.3	39.3	39.3	39.3	39.3	39.3
Tariff revenue post	40.1	40.4	39.8	39.4	38.8	38.5
Change (%)	1.8	2.5	1.1	0.1	−1.3	−2.0
	Total import tax revenue					
Total revenue pre	66.8	66.8	66.8	66.8	66.8	66.8
Total revenue post	53.1	40.4	59.3	71.6	65.8	70.6
Change (%)	−20.5	−39.6	−11.2	7.2	−1.4	5.8
	Collected tariff rates					
Tariff rate pre	6.5	6.5	6.5	6.5	6.5	6.5
Tariff rate post	6.5	6.5	6.5	6.5	6.4	6.4
Change (%)	0.7	0.4	0.5	0.6	−1.4	−1.8

[a] Scenarios simulated assuming elasticity parameters of $\sigma^P = 0.5$ and $\sigma^{ES} = 1.5$.
[b] All values are given in billions of SYP.

The results presented in Table 8 confirm the importance of some of the additional trade taxes as a share of Syrian trade tax revenues. An elimination of all trade taxes, besides tariffs and the revenue tax, would imply a reduction in revenues of 20.5%, while a simultaneous abolishment of the latter is projected to lead to imply an overall reduction of almost 40%. Consequently, caution is in order when implementing any reform involving the elimination of one or more—or even all—of these trade taxes, as the revenue impact is nontrivial.

However, columns three to six of Table 8 show that an appropriate (but still reasonable) choice of a VAT (to be implemented in 2010) may more than outweigh these losses. The advantage of a VAT—and the reason why it is so powerful in making up for revenue losses—is that it is levied on every product without exception (while concomitantly minimizing distortion). While the elimination of all trade taxes combined with a VAT on all products would still lead to a revenue loss of 11.2% in *Reform C*, *Reform D*, involving an only slightly increased VAT rate of 5%, is projected to ensure a considerable gain in trade revenues (of 7.2%). When we repeat these scenarios in *Reform E* and *Reform F* —with the modification that the VAT is now only levied on consumer goods and capital goods—the results suggest that in these cases a rate between 10% and 12% would be sufficient to keep the reform more or less revenue neutral.[22]

[22] The reason why we distinguish the case of a VAT levied on consumer and capital goods only is because the VAT on intermediate or primary products is usually subject to the possibility for rebate. Although the VAT will be levied on the respective final product at a later point, the primary or intermediate goods' contribution to the value of the final product is unclear *ex ante*. In the context of our attempt to isolate the impact of the VAT on trade revenues, the case of a VAT levied on consumer and capital goods only may give us an broad estimate of the upper bound on the VAT rate that is needed to guarantee revenue neutrality of the reform according to our model. For example, in order to generate a revenue gain of 5.8% in the case of *Reform F*, our model predicts that a VAT of 12% or below is needed.

Table 9
Trade impact of two potential comprehensive reform scenarios. [a]

	Scenario A	Scenario B
	Impact on imports	
Imports pre	607.3 [c]	607.3
Imports post	606.2	604.4
Change (%)	0.2	0.5
	Impact on revenue	
Tariff revenue pre	39.3	39.3
Tariff revenue post	28.5	39.4
Change (%)	−27.5	0.2
	Total import tax revenue	
Total revenue pre	66.8	66.8
Total revenue post	67.6	71.1
Change (%)	1.2	6.5
	Collected tariff rates [b]	
Tariff rate pre	6.5	6.5
Tariff rate post	4.7	6.5
Change (%)	−27.4	0.7

[a] Scenario simulated assuming elasticity parameters of $\sigma^P = 0.5$ and $\sigma^{ES} = 1.5$.
[b] Collected tariff rate refers to rate on applied tariffs.
[c] All values are given in billions of SYP.

3.3. Comprehensive revenue-neutral reform

Our final policy experiment is to combine the rationalization scenarios discussed in Tables 7 and 8 into one comprehensive reform, with a focus on designing a reasonable reform that has a neutral or slightly positive impact on revenues. Our comprehensive reform combines tariff band simplification along the lines of *Option A*, coupled with the elimination of all additional trade taxes along the lines of *Reform A*. We pair this with the introduction of a VAT (levied on consumer and capital goods only) of 15% (Scenario A). *Scenario B* combines *Option B* with *Reform A*, and introduces a slightly lower VAT of 12%. Note that since both VATs considered are applied only to a subset of all goods, we can regard these two rates—needed to guarantee the revenue neutrality of the reform—as upper bounds on any actual rates that may be introduced.

Table 9 suggests that the combination of the tariff band reform following *Option A* (which, recall, has a projected trade tax revenue loss of 14.9%), along with the elimination of all additional trade taxes following *Reform A* (which implies import tax revenue losses of 20.5%), could be held more or less revenue neutral if a VAT of 15% on consumer and capital goods were to be implemented simultaneously (the model actually predicts a slight gain of 1.2% in total trade tax revenue). Moreover, the second column suggests that tariff band reform via *Option B* (projected trade tax revenue gain of 0.9%), likewise combined with the elimination of all trade taxes, could even result in a considerable gain in revenues (of 6.5%).

3.4. Robustness of scenarios

We test the robustness of our results in Section 3.2 by considering variations in the elasticity parameter vector $[\sigma^P \sigma^{ES}]$. We choose three scenarios—the first three in each of our major classes

Table 10
Sensitivity of changes in tariff and trade tax revenue losses, by scenario.

Tariff revenue				Trade tax revenue			
	σ^{ES}				σ^{ES}		
σ^{P}	1.0 [a]	1.5	3.0	σ^{P}	1.0	1.5	3.0
EUSAA with no exclusion list							
0.3	−23.8	−24.8	−27.5	0.3	−14.5	−15.1	−16.7
0.5	−23.3	−24.3	−27.0	0.5	−14.0	−14.7	−16.3
1.0	−22.1	−23.1	−25.7	1.0	−12.9	−13.6	−15.2
Tariff option A							
0.3	−25.3	−25.4	−25.8	0.3	−15.3	−15.4	−15.5
0.5	−24.8	−24.9	−25.2	0.5	−14.9	−14.9	−15.0
1.0	−23.5	−23.6	−23.9	1.0	−13.8	−13.8	−13.9
Comprehensive scenario A							
0.3	−26.9	−27.1	−27.5	0.3	2.5	2.4	2.0
0.5	−27.3	−27.5	−27.9	0.5	1.3	1.2	0.9
1	−28.4	−28.5	−28.8	1	−1.8	−1.8	−1.9

[a] Numbers reported in percentage terms.

of policy reform—for which we present variations in tariff and overall trade tax revenue changes in response to variations in $[\sigma^{P}\sigma^{ES}]$. While, in the interests of keeping the robustness results reasonably transparent, we do not report sensitivity results for all scenarios, nor do we present estimates for changes in all the variables of interest. Nonetheless, the results offer a good general impression of the sensitivity of the results to changes in the model's key parameters. These sensitivity checks are summarized in Table 10, with tariff (trade tax) revenue losses reported on the left (right) half.

Table 9 shows that the results of our trade reform scenarios are not excessively sensitive to sensible changes in the model's parameters. The numbers reflect that, following tariff liberalization, an increase in the exporter substitution elasticity leads to more substitution between exporters towards those that receive tariff preferences, which increases tariff revenue losses. Since tariffs are part of the tax base of the spending tax and the revenue tax, the fall in tariff revenues also decreases revenues for the latter. An increase in the demand elasticity generates a stronger increase in imports as a response to a given tariff liberalization. This increases both tariff and trade tax revenues. The reasoning is similar for the case of a reduction in other trade taxes. The key difference is that trade taxes do not form part of the tax base for tariffs, such that the fall in revenues from, say, the spending tax or the revenue tax does not directly reduce tariff revenues.

4. Policy directions for trade reform in Syria

Between 1960 and 2000, the Syrian economy largely operated as a socialist economy, with extensive central planning and significant state intervention. In part due to this economic history, many Syrian officials favor a deterministic, engineered approach with regard to the state's policy reform efforts. Credible, successful policy reform in Syria therefore requires not just broad, generic policy prescriptions, but rather a measured approach that is accompanied by a proper articulation of the quantitative implications and consequences of any given policy proposal.

Our treatment of continued trade policy reform in Syria has therefore sought to provide a clear rendering of the adjustment costs associated with the two main policy scenarios—participation in

the EUSAA and further reform of the trade regime—that Syrian policymakers are currently in the process of contemplating. As a result, we regard the estimates provided in Section 3 as more than just a technical exercise, but rather an important input into the policy decisionmaking apparatus, and one that is especially valuable in the political-economic context of Syria.

As important as such figures are for Syrian policymaking, there are nonetheless important additional considerations that are of a more practical nature. In this section, we lay out some of the more major issues that Syrian policymakers are likely to confront.

In Section 3.2.1, we included simulations for several alternative coverages for an exclusion list. It is important to emphasize that our choice is based on purely technical reasoning, and that we do not advocate that the Syrian government necessarily choose an actual exclusion list along these lines, since doing so would clearly run counter to the purpose of the agreement in the first place. However, conditional on the fact that Syrian policymakers may, on various grounds, decide to exclude certain products from liberalization as part of the agreement, the results in Table 3 offer a broad range of the likely magnitude of the reform impact, and serve to illustrate the point that the choice of the exclusion list is an important determinant of the relative vulnerability of different sectors of the Syrian economy.

These findings suggest that the revenue consequences are likely to be manageable if an appropriate exclusion list is chosen. Irrespective of the revenue implications of the agreement, the fall in prices of imported consumer and intermediate goods in response to tariff liberalization is advantageous for consumers and producers, and will partially remove the significant anti-export bias in the Syrian economy, to the extent that the respective tariffs are not protecting significant amounts of production and employment. It is therefore helpful for policymakers to examine the sectors and subsectors that will experience the largest price changes as a result of the EUSAA.

What is more, the revenue impact of the agreement can be spread out over its implementation period. In contrasting the one-shot versus sequential EUSAA rollout, it is clear from Table 5 that the final liberalization step entails the largest tariff revenue losses. In a sense, this is unsurprising given the large number of nuisance tariffs in the Syrian import regime. However, it serves to highlight how an informed design of the phase-out schedule of the agreement calls for special attention to the fact that the distribution of tariffs is highly skewed towards the lower end. Depending on the priorities of policymakers in distributing revenue losses over the 12-year period, it may be worthwhile shifting some of the burden resulting from the last liberalization step towards earlier ones. Alternatively, the phasing-out process could be given a different structure; rather than capping tariffs at lower and lower values, a step-by-step percentage reduction in all tariffs may be preferable.

It is important to recognize that, for a small country such as Syria, a gradual phasing out of trade barriers will generally result in smaller welfare gains relative to an approach calling for an immediate phase-out (Kouparitsas, 2001). Nonetheless, political economy factors—especially with regard to fears over *ex post* revenue losses by the Finance Ministry—would suggest that the sequential approach that we lay out in Table 5 remains the most feasible policy option.

Our design of tariff simplification in Section 3.2.2 was influenced by what we regard as the three major problems in Syria's current import regime. These are the excessively complicated tariff structure (as evidenced by the number of non-zero tariff bands), the large number of tariff lines with nuisance rates, and the proliferation of (often arbitrary) additional charges applied at the border. All these features increase the complexity of the import regime, and make it less transparent and more costly for customs authorities to administer. The complexity of procedures is also a potential source of corruption. The tariff simplification options outlined in Table 6 are thus a reflection of these concerns.

We recognize that the estimates provided in Tables 7 and 8 are by no means an exhaustive accounting of all possible revenue-neutral reform options. While it is certainly possible to generate a greater range of other designs, we refrain from doing so, since the final choice for tariff reform will ultimately be made according to the priorities of Syrian policymakers, and these are not, *ex ante*, immediately obvious. What we would like to emphasize, however, is that the findings in these tables suggest that revenue concerns should not be a reason to shy away from a reform that would likely involve substantial efficiency gains. In other words, a reform of the highly complicated Syrian tariff regime involving a simplification of the tariff band structure can be implemented in the absence of substantial revenue losses if an informed choice is made with respect to the differential treatment of pre-reform tariff bands, along with a willingness to entertain the possibility of a VAT.

Throughout the paper, a central principle that guided has our policy prescriptions has been the recognition that fiscal considerations are often paramount for developing countries embarking on a path of trade liberalization, and that the revenue adjustment dynamics of any given trade policy is likely to involve painful adjustment costs, especially in the short run (Bevan, 1999). Nonetheless, the comprehensive reform scenarios captured in Table 9 suggest that mitigation measures that seek to preserve revenue neutrality are not only desirable, but eminently possible. We therefore regard the two scenarios introduced in Section 3.3 as our best recommendations for an appropriate policy mix that gives adequate consideration to efficiency, revenue, and political-economy concerns.

5. Conclusion

The ability to successfully implement any trade policy reform, as well as a reasonable evaluation of its *ex post* impact on national welfare, is often tied to the quality of *ex ante* evaluations of trade-related adjustment costs. Estimates of these adjustment costs are crucial in building the political-economic case for reform, as well as for practically implementing mitigation and adaptation policies.

This paper seeks to provide these estimates for Syria, which is an interesting case both because it is an economy that is transitioning from a centrally planned system—which has led to a proliferation of border charges applied by multiple actors—as well as because it highlights the tremendous efficiency gains that are possible from tariff rationalization, even when revenue neutrality is to be maintained. The estimates show that the impact of a substantial simplification of the Syrian import regime on revenue can be close to neutral, while the efficiency gains in terms of resulting cost savings are likely to be substantial. A similar conclusion can be drawn with respect to the implications of an Association Agreement with the European Union: the revenue impact is likely to be small if an appropriate exclusion list is chosen, and can be spread out over an implementation period of 20–25 years.

These findings can be used to inform the existing policy debate. The different reform options considered show how an informed design of the reform alternatives can lead to substantial differences in the magnitude of their impact on the Syrian economy, both in terms of revenues and protection. Ensuring that revenue neutrality is preserved during tariff reform may engender greater acceptance among government bodies concerned that fiscal integrity would otherwise be compromised. Moreover, in scenarios where a clear set of losers can be identified, our results provide estimates that can be used in the design of compensatory mechanisms. These subsidies may even lead to Pareto-improving reform outcomes that would otherwise be regarded as politically unpalatable (Davidson, Matusz, & Nelson, 2007).

The most straightforward way forward for further consolidating import liberalization in Syria therefore calls for a reduction in the number of tariff bands that are currently applied, from the existing 11 to perhaps 3 or 4 bands, with the lower bound for *a* d valorem tariffs held at or above the nuisance level of 5%. In addition, the myriad number of fixed and proportional trade taxes can be removed with revenue neutrality ensured by the implementation of an appropriately sized VAT.

Appendix A. Technical appendix

The precise calculation of the price change resulting from a trade policy change depends on how a country applies its tariffs and other trade taxes and charges. In Syria, tariffs are collected as a percentage of the c.i.f. import value, the spending tax, and the revenue tax are levied on the tariff-inclusive c.i.f. import value, while other charges—such as the city local tax—are a complex combination of fixed amounts as well as percentage shares of more than a dozen different tax bases; for simplicity, however, we assume that all other charges are calculated as a percentage of the c.i.f. import value.

A given *ceteris paribus* tariff change for good i from exporter j leads to a percentage price change given by

$$\begin{aligned}\Delta p_{ij} &= \frac{\tau'_{ij} - \tau_{ij}}{1+\tau_{ij}} \\ &= \frac{\left[\begin{array}{l}\left(1+\tau'_{ij}\right)\left(1+spe_{ij}\right)\left(1+rev_{ij}\right)\left(1+rem_{ij}\right) \\ -\left(1+\tau_{ij}\right)\left(1+spe_{ij}\right)\left(1+rev_{ij}\right)\left(1+rem_{ij}\right)\end{array}\right]}{\left(1+\tau_{ij}\right)\left(1+spe_{ij}\right)\left(1+rev_{ij}\right)\left(1+rem_{ij}\right)},\end{aligned} \tag{A.1}$$

where τ_{ij}, spe_{ij}, rev_{ij} and rem_{ij} are the tariff, the spending tax, the revenue tax and an aggregate of all other charges applied on good i from country j, respectively, and a prime indicates the post-reform value of a variable. For what follows, we utilize the tariff change in (A.1) as the trade policy shock, and describe the demand response changes that result.

The demand response for a given product is modeled in three consecutive steps: First, the model calculates how the allocation of expenditure on imports of a product changes across different country suppliers when tariffs are amended. These relative import changes are computed from the price change in (A.1), adjusted by the elasticity of substitution between exports. To isolate just the substitution effect, total exports are held constant.[23] More formally, the export substitution component of imports is calculated as

$$x_{ij}^{*ES} = \left(1+\sigma^{ES}\Delta p_{ij}\right) x_{ij}^{*} \cdot \frac{\sum_{n} x_{ij}^{*}}{\sum_{n}\left(1+\sigma_{j}^{ES}\Delta p_{ij}\right) x_{ij}^{*}}, \tag{A.2}$$

where σ^{ES} is the elasticity of substitution between exports from different supplier countries.

Second, the model calculates how the allocation of expenditure between domestic and foreign sources of a product is affected when the relative price of imports (to domestic goods) changes

[23] This involves deflating post-substitution imports from each supplier, by multiplying the ratio of total imports of the product before tariff reform to the sum of imports of the product from all trading partners after the substitution effects.

in response to trade reform.[24] This is implemented in two stages: first, relative demand changes are computed from changes in the aggregate (weighted average) price of imports, adjusted by the elasticity of substitution between domestic and foreign products. Individual suppliers then receive their share in the aggregate change in the demand for imported and domestically produced good respectively according to their share of the import market. Formally, we have

$$\begin{aligned} X_i^{*DS} &= (1 + \sigma_j^{DS} \Delta \bar{P}) X_i^*, \\ x_{ij}^{*DS} &= x_{ij}^{*ES} + (X_i^{*DS} - X_i^*) \cdot \frac{x_{ij}^*}{\sum_n x_{ij}^*}, \end{aligned} \tag{A.3}$$

where σ^{DS} is the elasticity of substitution between imports and domestic production, $X_i^* = \sum_m \sum_n x_{ij}^*$ is (initial) aggregate imports, and the percentage change in the aggregate price of imports is

$$\Delta \bar{P} = \sum_{j=1}^{n} \frac{1}{2} \cdot \left[\frac{x_{ij}}{\sum_n x_{ij}} + \frac{x'_{ij}}{\sum_n x'_{ij}} \right] \cdot \Delta p_{ij}.$$

Third, the model calculates how a product's domestic consumption (and thus both imports and domestic production) is affected by a change in its average domestic price. The price change is computed as a consumption share weighted average between imports and domestically produced goods. As before, this is implemented in stages, with induced consumption changes distributed across domestic and foreign sources, as well as between all importers, according to their shares in the domestic and the import markets, respectively. The calculation of total product demand requires

$$\begin{aligned} X_i^{TD'} &= (1 + \sigma^D \Delta \tilde{P}) X_i^{TD}, \\ X_i^{*'} &= X_i^{*DS} + (X_i^{TD'} - X_i^{TD}) \cdot \frac{X_i^*}{X_i + X_i^*}, \\ x_{ij}^{*'} &= x_{ij}^{*DS} + (X'_{i*} - X^{i*DS}) \cdot \frac{x_{ij}^*}{\sum_n x_{ij}^*}, \end{aligned} \tag{A.4}$$

where a dash indicates a post-reform value of a variable, X_i^{TD} is the initial total demand for product i, σ^P is the price elasticity of demand, $X = \sum_m \sum_n x_{ij}$ is (initial) demand for domestic output, and the percentage change in the aggregate price of imports is

$$\Delta \tilde{P} = \frac{X_i^*}{X_i + X_i^*} \cdot \Delta \bar{P}.$$

[24] As mentioned in the text, this effect cannot be taken into account in the case of this paper as sufficiently detailed sectoral production data is not available for Syria.

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