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Economic Effects of the Syrian War and the Spread of the Islamic State on the Levant

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Abstract

This paper uses a global computable general-equilibrium framework with new detail on six Levant countries—the Arab Republic of Egypt, Iraq, Jordan, Lebanon, the Syrian Arab Republic, and Turkey—to quantify the direct and indirect economic effects of the Syrian war and the advance of the Islamic State on the Levant. Syria and Iraq bear the brunt of the direct economic costs, while the other Levant countries lose in per capita but not in aggregate terms. The fact that the Islamic State's spread has undermined regional trade adds to varying degrees to the direct costs in all Levant economies and in the case of Syria and Iraq doubles the welfare losses. All these countries are foregoing opportunities to expand intra-Levant trade and the associated gains in economic efficiency and diversification. The average welfare effects are not indicative of within-country incidence, which varies among workers, landowners, and capitalists.

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Economic Effects of the Syrian War and the Spread of the Islamic State on the Levant*

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1. Introduction

On the eve of the Arab Spring, six countries in the greater Levant--Turkey, the Syrian Arab Republic, Iraq, Jordan, Lebanon, and the Arab Republic of Egypt--were considering reforms that would have deepened their trade ties and accelerated economic growth, diversification, and job creation. Specific attention was placed on liberalizing agricultural trade with Turkey, reducing the restrictiveness of non-tariff measures, improving transport logistics, and liberalizing intra-Levant trade in services. These reforms were considered essential for stimulating regional trade and were the main components of a reform package that would have been negotiated and implemented as part of a new Levant economic zone (World Bank, 2013).[1] In 2011, many of these countries embarked on political transitions that took priority over other issues. In Syria, initial demonstrations quickly turned into an uprising which grew into a civil war and resulted in widespread devastation with spillovers to neighboring countries. This war and the subsequent advance of the Islamic State of Iraq and Syria (ISIS) – collectively referred to in this paper as the Levant conflict or war – imposed enormous human, social, and economic costs and put a halt to the regional trade integration process, thus undermining development with serious implications for the future of the Levant.

Despite the widespread interest in the Levant war, there are no systematic analyses of its regional and country-specific economic effects. This paper addresses this gap and contributes to the literature a general equilibrium assessment of the Levant conflict, factoring in both the effects of war and the associated disintegration of regional trade. The paper is related to and combines features of two distinct literatures – on trade reform and restrictions (Trela and Whalley, 1990;

[1] We refer to the new Levant economic zone as simply the Levant or the Levant area, although the geographic Levant area includes other countries and territories. The six economies would have composed the new Levant economic zone.

de Melo and Winters, 1992; Yang et al., 1997; Ianchovichina and Martin, 2004; Walmsley et al. 2006; Anderson et al. 2006); and on natural disasters and wars (Grobar and Gnanselvam, 1993; Collier, 1999; Rose and Liao, 2005; Okuyama, 2007). Grobar and Gnanselvam (1993) use a case study approach relying on national accounts data to examine the economic effects of the Sri Lankan civil war and the potential future costs associated with a continuation of the conflict. Collier (1999), who provides an ex post assessment of all civil wars between 1960 and 1990, finds that war affects not only the level but also the composition of economic activity, especially for manufacturing and some services sectors in Uganda. Input-output (IO) models, as in Rose et al. (1997), are the most widely used modeling tools for ex-ante assessments of the higher-order effects of both natural and man-made disasters. The popularity of these models is based mainly on their ability to reflect the interdependencies within a regional economy and their simplicity, but they have rigid structure with respect to substitution among inputs and imports. These models also lack explicit resource constraints and responsiveness to price changes (Rose, 2004).

Unlike these widely used approaches for evaluation of disasters, this paper relies on a global computable general equilibrium (CGE) framework, documented in Hertel (1997). The model has been widely used in global, regional, and country-specific trade liberalization assessments and offers advantages in terms of ensuring consistency through explicit constraints while including important sectoral detail, such as input and import substitutability and price responsiveness. The paper demonstrates the advantages of the GE approach over these simpler conventional frameworks by assessing the "pure" general equilibrium (GE) effects of conflict, defined as the difference between the non-linear and linear solutions to the model, where by linear we mean a first-order approximation of the solution with data coefficients kept constant at initial levels. The pure GE effects differ in sign and size and are significant for Syria and Iraq, the two countries

most directly affected by the Levant war. Thus, the results indicate that simpler linear approaches would misstate the "true" effects of war, making it difficult to determine the direction of bias.

Although widely used and comprehensive in many ways, the GTAP 8 database has insufficient information on the Levant economies. Therefore, we modify the database and add to it input-output, trade, and protection data on Lebanon, Syria, Iraq, Jordan, and several other Middle East and North African (MENA) economies, including West Bank and Gaza, Yemen, Algeria, and Libya. This major modification required balancing both bilateral trade flows and macroeconomic country aggregates in the global database and was warranted in order to reflect accurately the regional spillover effects of the Levant war. We also adjusted trade preferences in all MENA countries in order to reflect accurately existing global, regional, and bilateral trade agreements and avoid overestimating the trade-related effects of foregone reforms.

Simulation results reported in the paper indicate the qualitative changes likely to occur as a result of the conflict and regional trade disintegration while the magnitudes of the direct war effects reflect the intensity and scope of the conflict as of mid-2014. The results suggest that Syria and Iraq bear the brunt of the direct war costs, losing 14% and 16% in per capita welfare, respectively. The embargo on trade with Syria is a major factor behind this country's real GDP decline, which is estimated at 30% and is much larger than its per capita output decline of 13%, due to the effect of Syrian refugees and war casualties on the population count. All other Levant economies lose in per capita terms, but not in aggregate terms because the inflows of refugees boost population numbers, and therefore aggregate consumption, investment, and labor supply. Lebanon's per capita welfare losses are largest and reach close to 11%, while those of Turkey, Egypt, and Jordan do not surpass 1.5%. The difference between aggregate and per capita welfare effects are most pronounced in Lebanon, where the increase in the refugee-to-citizen ratio is

greatest, and minimal for Turkey and Egypt, where refugees account for a small share of the population.

The direct effects of the Levant war are an understatement of the real economic costs of the Levant conflict. Recall that these countries were embarking on a process of regional trade integration just before the outbreak of war. If the foregone benefits of this integration, especially those associated with failed services liberalization, are included then the total costs of war for Syria and Iraq almost double, reaching 23% and 28%, respectively, and escalate to 10% for Egypt and 9% for Jordan. Furthermore, the average welfare effects are not indicative of the incidence within countries. In Syria, all economic agents are hurt but landowners lose the most as people abandon their homes and farms in search of security. By contrast, in Lebanon and Turkey, land and capital owners benefit while workers lose because the large number of refugees put pressure on demand and augment labor supply.

The remainder of this paper is structured as follows. Section 2 presents the features of the CGE model and the data modifications. Section 3 discusses the simulation design, including the main features of the pre-war plans for trade integration reforms and the war scenario. Section 4 presents the simulation results focusing on welfare, sectoral outputs, factor prices, and the pure GE effects. Finally, we summarize and offer concluding remarks in section 5.

2. Features of the CGE model and data modifications

The multi-country, multi-sector CGE model, used in this paper and documented in Hertel (1997), is well-suited and widely used for quantitative, ex-ante investigations of the effects of regional trade agreements. In this model, firms are assumed to produce for domestic and export markets, using constant-returns-to-scale technology and a mix of primary and intermediate inputs.

Intermediate products are either produced domestically or imported and substitute imperfectly, following the Armington structure. Product differentiation between imported and domestic goods and among imports from different regions allow for two-way trade in each product category, depending on the ease of substitution between products from different regions. Land, physical capital, skilled, and unskilled labor, and in some sectors a natural resource factor, are used as primary factor inputs into production. The model takes into account the role of overall resource constraints in determining sectoral output supply, has an explicit treatment of international trade and transport margins, a "global" bank mediating between world savings and investment, and a consumer demand system designed to capture differential price and income responsiveness across countries. The accounting relationships and behavioral linkages constrain outcomes in ways not possible with partial equilibrium models. Each country's exports of a particular good equal total imports of this good in other countries, net of shipping costs; global investment equals global savings; aggregate output determines aggregate income in each country; global supply and demand for individual goods balance; demand equals supply for each factor in a country; increases in total factor productivity which raise competitiveness also raise factor prices and help offset the original increase in competitiveness. The results obtained with the model are indicative of medium term outcomes as factor inputs are perfectly mobile across sectors and returns adjust to changes in economic conditions.

Table 1. Regional and Industry Aggregation

Economies/regions	GTAP region	Industry	GTAP commodity
1. Turkey (TUR)	Turkey	1. Primary agriculture (PRIMAGRI)	PDR, WHT, GRO, V_F, OSD, C_B, PFB, OCR, CTL, OAP, RMK, WOL, FRS, FSH
2. Egypt, Arab Rep. (EGY)	Egypt, Arab Rep.	2. Food processing (FOODPROC)	CMT, OMT, VOL, MIL, PCR, SGR, OFD, B_T
3. Jordan (JOR)	from Rest of Western Asia	3. Gas extraction and distribution (GASDISTR)	Gas, GDT
4. West Bank & Gaza (PSE)	from Rest of Western Asia	4. Oil extraction	Oil
5. Lebanon (LBN)	from Rest of Western Asia	5. Water	WTR
6. Syrian Arab Republic (SYR)	from Rest of Western Asia	6. Other natural resource extraction (OTHNATRE)	COA and OMN
7. Iraq (IRQ)	From Rest of Western Asia	7. Petroleum, coal products	P_C
8. Iran (IRN)	Iran	8. Electricity generation and distribution	ELY
9. Yemen (YEM)	from Rest of Western Asia	9. Chemical industry and metallurgy (CHEMMETA)	CRP, NMM, I_S, NFM
10. GCC (GCCC)	Kuwait, Qatar, Bahrain, Saudi Arabia, United Arab Emirates, and Oman	10. Textiles and apparel (TEXTAPPA)	TEX, APP
11. Morocco (MAR)	Morocco	11. Resource based manufacturing (RESBAMAN)	LEA, LUM, PPP,
12. Tunisia (TUN)	Tunisia	12. Equipment, vehicles and machinery (EQUIVEHI)	ELE, OME, MVH, OTN,
13. Libya (LBY)	from Rest of North Africa	13. Metal products	FMP
14. Algeria (DZA)	From Rest of North Africa	14. Other manufactures	OMF
15. EU27 (EU27)	All 27 member states, XNA (all EU member territories), XTW (all except Antarctica are EU territories)	15. Construction	CNS
16. USA (USA)	USA	16. Transport	OTP, WTP, ATP
17. Japan (JPN)	Japan	17. Trade	TRD
18. NIEs (NIES)	Korea, Rep.; Hong Kong SAR, China; Singapore; Taiwan, China	18. Communication	CMN
19. China (CHN)	China	19. Finance, Insurance, Real Estate	OFI, DWE, ISR
20. India (IND)	India	20. Public services	OSG
21. Russia (RUS)	Russia	21. Business services	OBS
22. Rest of Asia (RASI)	Rest of East Asia (XOC, Mongolia, XEA, KHM, IDN, LAO, MYS, PHL, THA, VNM, XSE) and Rest of South Asia (BGD, NPL, PAK, LKA, XSA)	22. Tourism and other services	ROS
23. SSA (AFRC)	All countries in SSA		
24. LAC (LATA)	All countries in LAC (including XSM, XCA, XCB)		
25. Rest of OECD (OECD)	Australia, New Zealand, Canada, Switzerland, XEF		
26. Rest of Europe & FSU (EFSO)	Albania, Belarus, Croatia, UKR, XER, KAZ, KGZ, XSU, ARM, AZE, GEO		

The paper extends the GTAP 8 database by separating Lebanon, Jordan, Syria, Iraq, and West Bank and Gaza from the rest of the Western Asia aggregate and Algeria and Libya from the rest of North Africa. Kuwait, Qatar, Bahrain, Saudi Arabia, UAE, and Oman are aggregated into a GCC composite group. In addition, the 57 sectors in the GTAP 8 database are aggregated into 22 sectors based on their importance for the countries in the MENA region (Table 1). The resulting MENA-specific database contains 26 countries, among which are the six Levant economies of interest in this paper (Turkey, Lebanon, Syria, Iraq, Jordan, and Egypt) and the rest of the developing MENA countries (Table 1).

The procedure used to construct the individual country information employs data from several sources. The UN Statistics Division data for 2007 is the source for the six components of GDP – agriculture, hunting, forestry, and fishing (ISIC A-B); mining, manufacturing, and utilities (ISIC C-E); construction (ISIC-F); transport, storage, and communication (ISIC I); wholesale, retail trade, restaurants and hotels (ISIC G-H); and other activities (ISIC J-P).

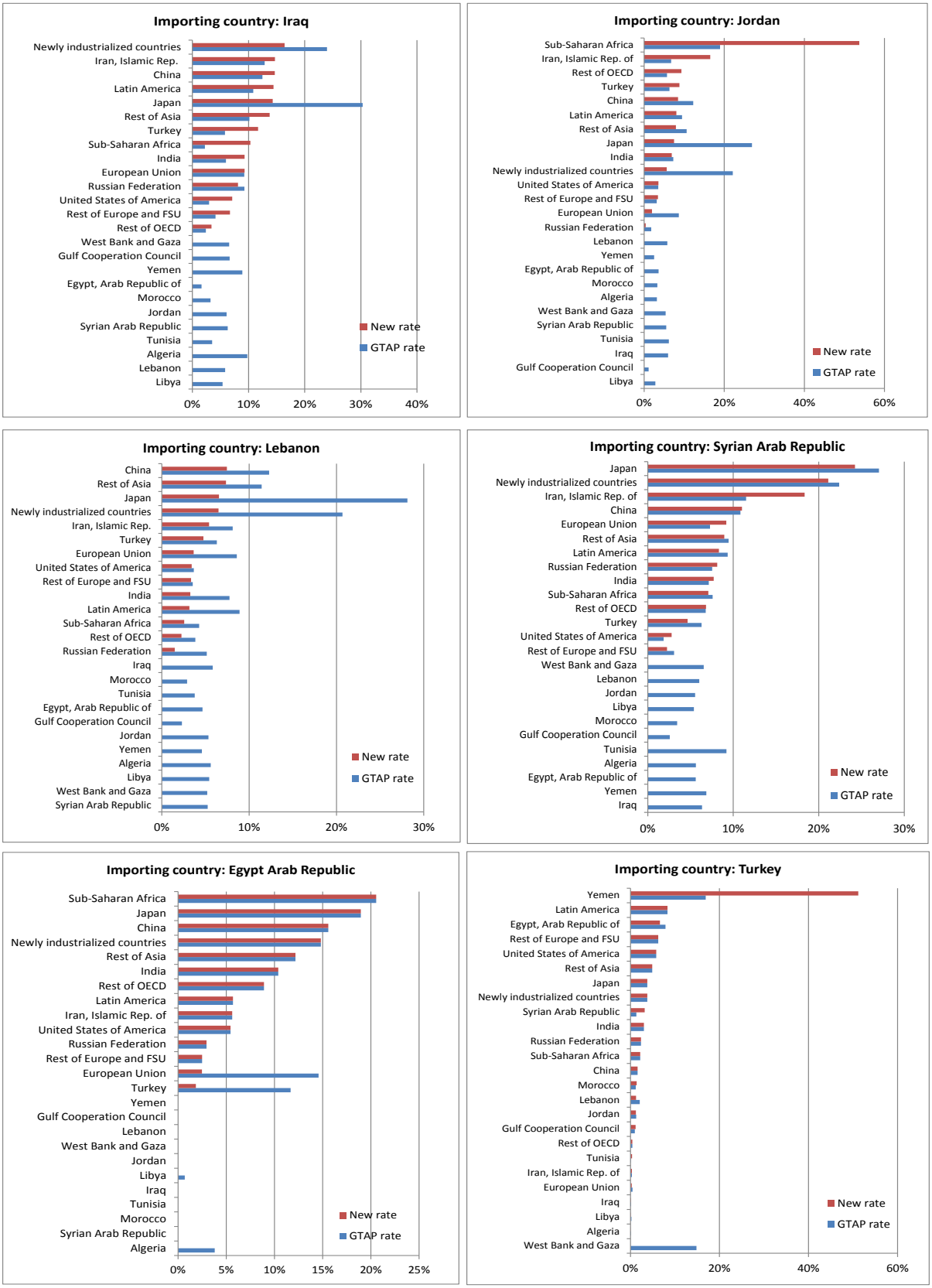
We sourced bilateral trade value data from WITS and bilateral tariff data from a medley of sources, presented in Appendix Table A1. As part of this procedure, all entries in the two composite regions (rest of Western Asia and rest of Northern Africa) were split and assigned the split values to the newly created economies, while all entries for the two composite regions from the GTAP database were removed from the database. Each entry was split using the most thematically relevant external source. Sectoral GDP shares were used to split consumption and production values, trade data were used to split export and import values, and tariff information was used to assign tariff values. Export shares were used to split further production and consumption information into the final set of industries presented in Table 1. For internal consistency purposes, the required accounting relationships were imposed on the split database

using iterative proportional fitting and the procedure was repeated until the database was balanced and consistent with all external targets.

Another important modification was the implementation of the Pan-Arab Free Trade Area (PAFTA),[2] the bilateral preferences associated with the Euromed Association Agreements (AAs), and the bilateral FTAs with Turkey into the tariff rate structure of the GTAP 8 database.[3] We obtained information on bilateral preferences at the most disaggregate product level from a variety of sources, including MFN and non-MFN rates from WTO data, country tariff data, and in the case of the European Union, Eurostat (see Appendix Table A1). Bilateral rates among PAFTA members were set at zero to reflect free trade in agricultural goods and manufactures. Whenever bilateral country tariff information and non-MFN rates from WTO sources were not available, we assumed reciprocity and applied the rates extended by the partner. In the absence of such rates we applied the MFN WTO rates. Duties on imports from countries outside the MENA region were left unchanged whenever the importing country was part of the GTAP database. In those cases when the country information had to be created from a composite region, we applied WTO MFN rates or used country information. The detailed data on bilateral tariff lines were aggregated into weighted average rates for the 22 sectors in the paper using bilateral import data from WITS for 2007.[4] Whenever such data were not available, imports were inferred from exports for 2007 or from WITS data for 2008.

[2] PAFTA led to the removal of tariffs on intra-regional trade in manufactured and agricultural products in the mid-2000s.
[3] During the 2000s most MENA countries negotiated these agreements with the objective of extending the free trade area created by PAFTA to the North by including two major markets and potential locomotives of growth – the European Union (EU) and Turkey.
[4] This year was chosen in order to match the benchmark year of the GTAP 8 Data base.

Figure 1. GTAP 8 Database and modified protection rates in the Levant countries



These tariff rate modifications are essential for this analysis as suggested by the substantial differences between the tariff rates available in the GTAP 8 database, especially those implied for Jordan, Iraq, Lebanon, and Syria (Figure 1), and the updated tariff rates, presented by country, product, and source in Appendix Tables B1-B6. Since the GTAP tariffs attributed to Jordan, Iraq, Lebanon, and Syria are composite rates, they do not correspond to the actual trade profile of these countries. Therefore, the new tariff rates differ from the GTAP ones both because of differences in the tariff lines and trade composition. By contrast, the tariff information on Egypt and Turkey in the GTAP 8 database represents relatively accurately existing preferences (Figure 1).

3. Simulation design

The pre-war efforts for deeper trade integration in the Levant are reflected in the pre-simulation analysis. Starting from the newly constructed database, the pre-simulation analysis implements the deep trade initiatives discussed by the Levant countries prior to the onset of the Syrian war in 2011. The context for these reforms and the shocks associated with each of these reforms are presented in section 3.1. The updated database from the pre-simulation analysis, which represents an integrated Levant in a peaceful alternative world, is the starting point for the simulation analysis of the Syrian conflict and the spread of ISIS as well as the disintegration of the deep regional trade ties. The design of the war and disintegration scenarios are presented in section 3.2.

3.1 Construction of the pre-simulation database

On the eve of the Arab Spring, the Levant economies were eager to move forward with plans for a new Levant Economic Zone (LEZ) which would have enforced deep trade concessions and therefore generated potentially bigger gains than those associated with past shallow trade agreements.[5] It would have removed tariffs on agricultural and processed foods trade between Turkey and the five Levant countries and would have liberalized transport and trade in other services within the LEZ. Reforms were expected to address the constraints to a strong supply response by reducing the negative effect of public monopolies in key services sectors,[6] harmonizing business and investment climate rules and regulations,[7] especially those governing investments in services, improving domestic and cross-border infrastructure and logistics and the implementation capacity in junior partner countries.[8] The hope was that reforms would propel convergence toward best practices and thus advance private sector development in the greater Levant area.

Importantly, the regional trade agreement would have underpinned political and security arrangements in the region, consolidated the bilateral FTAs of Egypt, Lebanon, Jordan, and Syria with Turkey, and improved market access for Turkey and Iraq to each other's economies. The negotiations were expected to be constrained by Turkey's pre-existing agreements. Turkey

[5] In MENA, the benefits of trade liberalization, involving mainly tariff removal on manufactured goods, have been limited (Testas, 1998, 2002; Al-Atrash and Yousef, 2000; and Freund and Portugal-Perez, 2012). Konan (2003) and Bchir et al. (2006) argued that the benefits would increase with deepening of the commitments, especially the opening of the services sectors. Barriers to trade in services were higher than in economies with similar incomes in other parts of the world (Hoekman and Sekkat, 2010) and their removal was expected to lead to a significant productivity boost in services and the boarder economy (Hoekman and Messerin 2001).

[6] See, for example, studies by Hoekman and Zarrouk (2000) and Rosotto, Sekkat, and Varoudakis (2005).

[7] Using a survey of firms in eight Arab countries, Zarrouk (2003) estimated that in 2000 the cost of getting goods across borders was on average 10 percent of the value of transported cargo. Prohibitions, arbitrary changes in documentary requirements, surcharges, and discriminatory taxes imposed severe costs on intra-Arab trade.

[8] Recent assessments suggest that progress has been made in terms of reducing the frequency and restrictive power of non-tariff measures (NTMs) (Augier et al. 2012).

would have been unable to make further concessions on manufactured goods' tariff because of its customs union with the European Union. Therefore, it was assumed that other Levant countries would be reluctant to open further their markets for manufactured imports from Turkey. However, because the customs union excludes agricultural trade, Turkey would have been able to remove or significantly reduce its agricultural and food tariffs on trade within the Levant. The concessions would have been sizable as tariffs on Turkey's imports of agricultural goods and processed foods from many of the Levant economies were much higher than tariffs on manufactured imports from these same countries (see Appendix Table A1).

This momentum for deep trade reform is reflected in the pre-simulation scenario in the following way. Tariffs on imported food and agricultural products are set to zero in the six Levant economies. Any tariff revenue loss due to this reform is assumed to be compensated by a consumption tax increase so as to keep the tax revenue constant as a share of income. Improvements in transport logistics is assumed to result in cost reductions associated with a more efficient process of shipping goods within the Levant area. The shocks are proportionate to the reductions needed to bring down the transport cost of a standard container unit to and from these countries to those of a leading country in the region, including MENA and Turkey. Information on transport costs comes from the World Bank's Doing Business database.[9] In the case of exporting a container, the lowest cost country in the developing part of the Mediterranean region is Morocco. In the case of importing a container Egypt is the lowest cost country, while Jordan is the lowest cost country without access to the Mediterranean.

[9] Unlike Balistreri, Tarr, and Yonesawa (2014) we cannot employ the database on ad valorem equivalents of the costs of time in exporting and importing as this database does not have information on four of the six Levant economies of interest to us – Lebanon, Jordan, Syria, and Iraq.

Since the GTAP model does not differentiate across firms based on their ownership structure, as in Tarr and Rutherford (2010), cross-broader services trade liberalization is reflected following Walmsley *et al*. (2006) and representing the opening of the service sectors to foreign competition as an efficiency improvement. Doytch and Uctum (2011) show that service FDI spurs growth in the sector while a number of papers (Haskel *et al.*, 2007; Markusen *et al.* 2005) show a positive association between a firm's productivity and the extent of foreign ownership of the firm. Haskel *et al.* (2007) find a robust and significant positive correlation between the productivity of British firms and the extent of foreign ownership whereas Markusen *et al*. (2005) argue that foreign presence in services provides substantial benefits to domestic firms. The efficiency boost to service companies engaged in cross-border service trade is implemented as a productivity shock which lowers the effective prices of imported services. In order to estimate the size of the productivity shocks, services productivity Π is represented as a function of the trade restrictiveness policies affecting this sector, given by index Ψ, and other factors, represented as Ω. This way productivity Π is given by $\Pi(\Psi, \Omega)$ and the percentage change in productivity is $\widehat{\Pi} = \varepsilon\widehat{\Psi}$, where ε is the elasticity of the productivity Π to change in the index Ψ. With the elasticity ε equal to 1, changes in the trade restrictiveness index Ψ translate into changes in productivity.[10,11] Using the World Bank's Services Trade Restrictions (STR) database, which contains values of the STR index (STRI) for several service sectors in the Levant countries, and assuming that trade liberalization will reduce the STRI to the minimum of the corresponding indexes in the Euromed area, we computed the implied productivity changes. Sectoral STRIs were available only for financial services and insurance, communications, trade, transportation,

[10] This approach allows us to assess the effect of services liberalization without estimating the ad valorem tariff equivalents of the policies restricting trade in services. The process of computing the tariff equivalents is complex and requires additional information which was not available for the Levant countries.

[11] Although the STR indexes are not constructed with regard to a specific factor such as productivity, their construction takes into account supply implications and thus the productivity levels in the sector.

and other business services. In the case of construction and tourism, we used the overall STRI, and in the case of Syria, data were not available so we assigned the average regional STRI to each sector. The shocks differ in size and suggest that the liberalization-associated efficiency improvements will be smallest for Turkey (Table 2), as Turkey's services sectors are the most open and productive in the region.

The opening of the services sectors to foreign investment and competition is also expected to boost value-added productivity in some services sectors, resulting in convergence to the highest value added per worker in the region. This process will be gradual and complete convergence is expected to occur only by the end of a 20-year period.[12] Since results are representative of what is likely to happen in a 3 to 5 year timeframe, we first compute the productivity shocks required for complete convergence over a 20-year period, then we annualize them, and finally cumulate them to represent the productivity growth expected only in the span of 3 years. The resulting productivity shocks are shown in Table 2. They suggest that in the Levant, Turkey is expected to be a productivity leader in transport, communication, finance, insurance and real estate, and business services, while Lebanon in construction and retail trade activities.

Table 2 Productivity growth associated with services liberalization (%)

	Turkey		Jordan		Lebanon		Egypt		Iraq		Syria	
	Import-augmenting	Value-added	Import-augmenting	Value-added	Import-augmenting	Value-added	Import-augmenting	Value-added	Import-augmenting	Value-added	Import-augmenting	Value-added
Construction	0.0	12.9	9.3	29.7	9.3	0.0	27.3	55.5	9.3	75.7	9.3	68.5
Transport	0.0	0.0	26.8	25.8	26.3	20.1	16.1	35.7	17.8	71.6	17.8	37.1
Trade	0.0	4.4	25.0	21.8	25.0	0.0	50.0	21.6	17.9	62.5	17.9	19.6
Communication	0.0	0.0	25.0	25.8	25.0	20.1	25.0	35.7	26.8	71.6	26.8	37.1
FIRE	0.0	0.0	39.0	19.3	39.0	8.1	39.5	31.5	31.3	53.2	31.3	38.3
Business Services	15.9	0.0	0.0	19.3	7.9	8.1	10.7	31.5	1.9	53.2	1.9	38.3
Tourism & Other Services	0.0	4.4	9.3	21.8	9.3	0.0	27.3	21.6	9.3	62.5	9.3	19.6

[12] We exclude from the analysis all government-related services.

The macroeconomic closure for this simulation is consistent with the medium-term timeframe and assumes a constant level of employment, with perfect mobility of skilled and unskilled labor between sectors and none between countries or regions. Since the model does not keep track of differences between foreign and domestic assets, we assume that Levant countries' trade balances are fixed as a share of the size of the economy.

3.2 Simulation scenario of war and trade disintegration in the Levant

We consider trade disintegration an indirect but essential effect of the Levant conflict. Therefore, the database obtained from the pre-simulation scenario of deep trade liberalization is the initial point for the war and trade disintegration scenarios. We implement shocks that completely reverse the deep trade reforms discussed in 3.1 as well as shocks reflecting: (i) the change in population and labor force size due to loss of life in Syria; (ii) the change in population and labor force size due to refugee movements across countries; (iii) infrastructure destruction in Syria; (iv) increases in trade costs in the Levant; (v) embargo on trade with Syria; and (vi) deterioration in productivity in Iraq. The CGE framework then helps us assess the implications of these shocks on other economic variables in the model. Next, the paper presents details on the elements of the war scenario and the changes to the macroeconomic closure in order to accommodate labor mobility across countries in response to refugee movements.

The war in Syria triggered massive displacement of people and outflows of Syrian refugees into neighboring countries, especially Jordan and Lebanon. In order to implement cross-border movements of people in the model, we relax the assumption of no international labor mobility and adjust the population and labor force of both refugee-receiving and refugee-sending countries, using information from UNHCR Population STATICS and ILOSTAT Database.

Syria's population and labor force were adjusted downward in order to reflect (a) the loss of life since 2011; (b) the number of Syrian refugees who fled the country during the period from 2011 to 2014;[13] and (c) the number of Iraqi refugees who left Syria during the same period.[14] At the same time, the population and labor force of the refugee-receiving countries were adjusted upward in order to reflect the inflow of refugees from Syria (Table 3). Adjustments were also made in order to reflect the return of Iraqi refugees to their home country during the period 2007-13. In the absence of information on the skill mix and participation rates of Syrian refugees, we assume that skilled and unskilled workers are equally affected by the war and that labor force participation rates among refugees are respectively the minimum of the participation rates in Syria and each refugee receiving country. The shocks to the Levant countries' population and labor endowments are shown in Table 3. Although adjustments were made in all countries/regions in the model, we show only those applying to the Levant as the magnitudes for countries outside the Levant are negligible.

Table 3 Population, labor force & transport cost shocks due to conflict in the Levant (%)

			Transport costs					
	Population	Labor force	Turkey	Egypt	Jordan	Lebanon	Syria	Iraq
Turkey	0.9	0.8	0.0	3.5	-18.3	-35.2	-18.4	-11.1
Egypt	0.2	0.1	5.9	0.0	12.2	-10.2	2.5	3.6
Jordan	2.5	2.3	-19.5	11.1	0.0	-32.9	-15.7	-8.5
Lebanon	19.5	15.4	-16.2	10.9	-11.3	0.0	-13.4	-7.3
Syria	-20.7	-19.0	-23.8	-4.9	-20.2	-33.4	0.0	-12.5
Iraq	7.3	7.6	-9.2	4.2	-6.5	-15.0	-8.1	0.0

We use the World Bank's Doing Business data on the costs of importing and exporting a standard container and ESCAP World Bank International Trade Costs data on international

[13] We make this adjustment in order to assess accurately the medium-term effects of war and reflect the fact that the majority of Syrian refugees plan to return to Syria only upon the fall of the Assad regime.
[14] We assume that all Iraqi refugees in Syria have gone back to Iraq.

shipping costs to compute the increase in transport costs due to the Levant war. The escalation of transport costs is represented as deterioration in the efficiency of shipping goods from each of the six Levant economies. The numbers in Table 3 reflect the fact that during the period between 2007 and 2014 the costs of importing and exporting goods and shipping them across borders within the Levant increased substantially, except in the case of Egypt.

Oil exports from Syria are assumed to decline dramatically (by 90%) due to a combination of factors, including sanctions imposed by the EU and the US and loss of infrastructure. We assume that 20% of Syria's physical capital has been destroyed - a decline as large as the decline in Syria's labor force. In Iraq, we assume the advance of ISIS has led to a 5 % decline in total productivity. The decline in oil exports from Syria and Iraq is offset by a corresponding increase in the production of oil by the GCC countries so that the effect on the world oil price is negligible. This is a realistic assumption because Saudi Arabia has the spare capacity to fully offset a drop in Iraqi and Syrian oil exports. We also assume that Syria's nonoil exports are affected by restrictions on trade between US and Syria and EU and Syria in specific categories, including equipment and vehicles, chemicals, metals, and capital goods.

4. Simulation results

4.1 Welfare effects

The results suggest that Syria and Iraq bear the brunt of the direct war losses as the conflict drags down their per capita welfare by 14% and 16%, respectively. Neighboring Levant economies lose to varying degrees, with per capita welfare declining by almost 11% in Lebanon, less than

2% in Jordan, and only negligibly in Turkey and Egypt (Table 4). The embargo on trade with Syria has been a major factor behind the deterioration in Syria's per capita welfare, reducing it by more than 15%, while capital destruction and loss of workers are responsible for declines of more than 5% and 7%, respectively. In Iraq, the per capita welfare losses are associated with the deteriorating environment and the resulting decline in productivity. In Lebanon, the main effect comes from the massive inflow of Syrian refugees.

Table 4 Welfare effects of war and trade disintegration in the Levant (%)

	Turkey	Egypt	Jordan	Lebanon	Syria	Iraq
Direct per capita effects of war	*-0.5*	*-0.1*	*-1.4*	*-10.6*	*-14.0*	*-16.1*
Output effects	0.0	0.0	0.0	-0.1	-6.3	-12.6
Capital destruction	0.0	0.0	0.0	0.0	-5.4	-0.1
Trade cost escalation	0.0	0.0	0.0	-0.1	-0.1	-0.2
Trade embargo on Syria	0.0	0.0	0.1	0.0	-15.4	0.0
Labor force effects of refugees	0.4	0.0	1.0	6.0	-7.5	2.8
Population effects of refugee movements	-0.9	-0.2	-2.5	-16.4	20.8	-6.1
Per capita effects of trade disintegration	*-1.4*	*-9.0*	*-5.8*	*-2.2*	*-8.6*	*-12.0*
Foregone agricultural liberalization	0.0	-0.1	0.0	0.0	0.0	0.0
Foregone transport logistics reform	0.0	-0.1	0.0	-0.2	0.1	-1.0
Foregone services liberalization	-1.4	-8.8	-5.7	-2.1	-8.7	-11.0
Per capita cumulative effects	*-2.0*	*-9.1*	*-7.2*	*-12.8*	*-22.6*	*-28.1*
Aggregate cumulative effects	*-1.1*	*-8.8*	*-4.7*	*3.9*	*-38.3*	*-23.4*
Direct aggregate effects of war	0.3	0.1	1.0	6.4	-30.7	-10.7
Trade disintegration effects	-1.4	-8.9	-5.7	-2.5	-7.5	-12.7
Cumulative effects in US$ 2007	*-6,510*	*-10,483*	*-834*	*912*	*-12,280*	*-3,997*

Syria's direct aggregate welfare decline is much larger than its per capita welfare loss (Table 4). Syria's economy shrinks by almost a third due to the massive outflow of Syrian refugees and war casualties. By contrast, Iraq's aggregate welfare loss of 11% is smaller than its per capita welfare

decline because a large number of Iraqi refugees in Syria have returned to Iraq during the period 2010-14. All other Levant economies gain in aggregate terms as the influx of refugees boosts their population numbers, increasing demand for goods and services and labor supply. These effects are most pronounced in Lebanon, where the refugee-to-citizen ratio is greatest, and minimal for Egypt, where refugees account for a small share of the population. The global effects of the crisis are negligible[15] because the conflict has no effect on the main channel of transmission – oil prices.

If in addition to the direct effects of war we include the effects of regional trade disintegration, we find that the Levant conflict hurts significantly all Levant economies (Table 4). Iraq's direct per capita welfare losses from the conflict are as large as its losses from trade disintegration, which are largest among the Levant economies. Stated differently, Iraq's average per capita income could have been nearly a third larger had the country managed to avoid conflict and liberalize its economy. Syria's trade disintegration losses are slightly lower than Iraq's but still sizable at almost 9% in per capita terms. Thus, Syria's per capita income could have been a quarter larger had the country managed to steer away from the civil war and proceeded with its plans to integrate into the regional economy of the Levant. In Lebanon, the inflow of refugees expands the size of the economy but this output expansion is not as large as the increase in population so in per capita terms welfare declines by almost 13% (Table 4). Trade disintegration losses are much larger than any direct war losses in the cases of Egypt, Jordan, and Turkey. For example, Egypt does not lose directly from the war in the Levant but its per capita loss from trade disintegration is 9%. The difference is stark for Jordan as well. The results suggest that the medium term economic effects of the Levant war are sizable for all Levant economies.

[15] The results for other countries are negligible in size and therefore not shown in the paper, but are available upon request.

Consistent with the results in the literature, most of the disintegration losses stem from foregone services liberalization, whereas those from foregone agricultural liberalization and transport logistics reform are negligible, although the sectoral effects are sizable for some sectors, as discussed in the next section, and for landlocked Iraq which loses 1% from foregone transport logistics reform. The foregone services liberalization generates sizable welfare losses as barrier to entry hurt productivity and put upward pressure on production costs as well as the costs of importing services within the Levant. The results, however, differ across countries reflecting the different extent of productivity loss. As a productivity leader in the Levant, Turkey's losses are small and stem mainly from failed liberalization of construction and business services.[16] By contrast, Iraq's service sectors are among the most inefficient in the Levant so its welfare loss from failed services liberalization of 11% is largest. Syria and Egypt also lose to a substantial degree, reflecting the fact that their service sectors are more protected and less efficient than those of Jordan and Lebanon.[17]

4.2 Sectoral effects

The direct sectoral effects of the conflict are negative and sizable across the board only in Syria and Iraq (Table 5), where the war has led to a productivity decline, and in the case of Syria considerable capital destruction and loss of labor. In fact, Jordan and Lebanon register sectoral expansions in response to the refugees' effect on the demand for goods and services and supply of labor. The direct sectoral effects of conflict in Turkey and Egypt are negligible. Regional trade

[16] According to the STRI data, Lebanon and Jordan have the least restrictive policies in terms of foreign presence in construction and business services in the Levant, respectively.

[17] The inflow of refugees has created serious challenges, among which crime, congestion, and a strain on public systems for delivering basic services. This analysis does not factor in these challenges nor provides estimates of the financing needed to address them.

disintegration, however, drags down intra-Levant trade (Figure 2), services productivity as well as the cost of producing and importing services within the Levant area with negative effects for output of services in all Levant economies (Table 5). To the extent that services are used as intermediate inputs into other services, the Levant economies see broad-based contraction of economic activity. The effects, however, differ by country. Turkey's economy is relatively unscathed by the trade disintegration because it already has the most open services sectors in the Levant (Table 2). It suffers losses mostly because of foregone opening of business services and construction. Given its size, however, Turkey's trade losses are largest in dollar terms as it foregoes nearly US$1.6 billion in exports to Levant countries (Figure 2).

Table 5 Sectoral output changes (%)

	Turkey		Egypt		Jordan		Lebanon		Syria		Iraq	
	Conflict	Disinte-gration	Conflict	Disinte-gration	Conflict	Disinte-gration	Conflict	Disinte-gration	Conflict	Disinte-gration	Conflict	Disinte-gration
Primary agriculture	0	-1	0	-3	0	-3	8	0	-12	-4	-3	-7
Processed food	0	-1	0	-7	1	-3	10	0	-15	-4	-2	-4
Gas extraction & distr.	2	-1	0	3	0	1	5	2	-10	-6	1	-18
Oil extraction	1	0	0	-2	1	-2	3	-1	-50	0	-2	-1
Water	0	-2	0	-10	1	-4	6	-1	-26	-6	-5	-11
Other natural resources	0	-1	0	-3	0	1	1	0	-23	4	-5	-7
Petroleum and coal	0	-3	0	-7	1	-7	3	0	-29	-6	-3	-23
Electricity	0	-2	0	-9	1	-7	5	-1	-25	-10	-3	-20
Chemicals and metallurgy	0	-2	0	-8	2	4	4	6	-39	3	-13	-13
Textiles and apparel	1	-1	0	-6	2	3	10	2	21	-4	-9	-29
Resource based manufactures	0	-2	0	-8	3	-3	11	5	-8	-4	-7	-16
Equipment and vehicles	0	-2	0	-8	2	-3	11	6	-8	-5	-10	-11
Metal products	0	-2	0	-13	4	1	12	5	-18	-2	-6	-7
Other manufactures	0	-1	0	-12	1	2	2	7	-39	-2	-20	-8
Construction	0	-2	0	-14	1	-9	4	-2	-25	-9	0	-9
Transport	0	-1	0	-26	1	-16	3	-9	-21	-19	-9	-32
Trade	0	-3	0	-14	1	-9	5	-1	-27	-8	0	-16
Communications	0	-1	0	-25	1	-26	7	-14	-7	-31	4	-54
FIRE	0	-1	0	-20	1	-16	4	-5	-19	-22	-6	-33
Public services	1	-1	0	-5	2	0	13	0	-20	-3	-3	-6
Other Business services	0	-2	0	-27	1	-28	3	-10	11	-47	4	-57
Tourism and others	0	-3	0	-15	1	-15	8	-1	-19	-13	-4	-26
Total real output	*0*	*-2*	*0*	*-11*	*1*	*-8*	*7*	*-2*	*-30*	*-8*	*-8*	*-11*

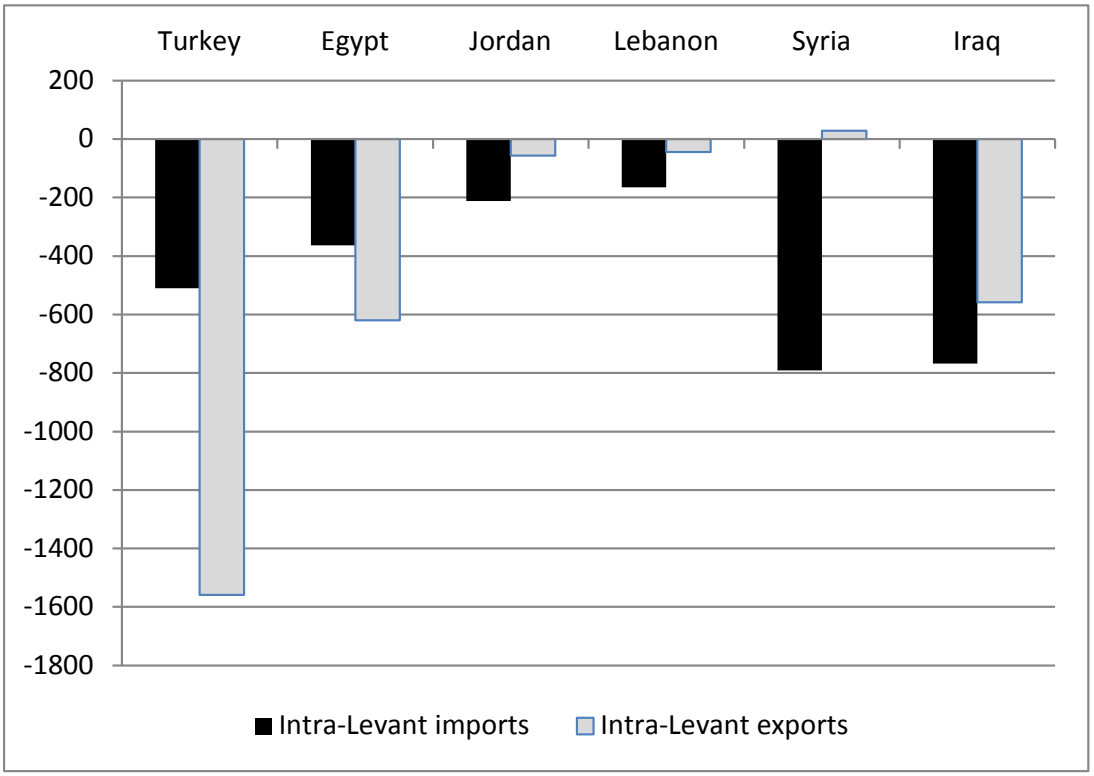
Note: Integration results reflect cumulative changes due to all trade reform initiatives.

By contrast, trade disintegration worsens considerably the economic decline in Syria and Iraq, hurting especially the prospects for commercial services which are heavily protected. In both economies, hardest hit are business services, communications, finance, insurance and real estate, and transport, but other sectors also experience double digit declines (Table 5). Jordan's and Lebanon's output losses from regional trade disintegration are most pronounced in services. In Jordan, business services and communication contract by almost 30%, while tourism and transport services lose 15%. In Lebanon, business services and communication decline by 10% and 14%, respectively.

Trade disintegration is also accompanied by increases in transport costs on trade to and from the Levant countries. These increases have most detrimental effect on output and intra-Levant trade

in bulky products with high transport margins, such as agricultural goods, processed foods, natural resources, and metals. In sum, regional trade disintegration as part of the Levant conflict deprives all six economies of opportunities to trade, transform the structure of their economies, and create quality jobs in services and manufacturing. These results are in line with papers which find a negative association between political instability and foreign direct investment flows to MENA (Burger et al. 2013; Meon and Sekkat, 2012). Importantly, Burger et al. (2014) find that political instability does not have an effect on greenfield investments in resources and nontradables but inhibits investments in tradable activities such as commercial services and non-oil manufacturing, thereby slowing structural transformation.

Figure 2. Effects of trade disintegration on intra-Levant trade volumes (in US$ millions)



4.3 Incidence within countries

The average welfare effects presented in section 3.1 are not indicative of the incidence of the Levant war across economic agents (Table 6). In Lebanon and Turkey, the direct effects of war on real returns to land and capital are positive, although the magnitudes of these effects differ considerably due to the much larger share of refugees in the Lebanese population. Consequently, real land rents rise by close to 40% in Lebanon and by just 2% in Turkey. Landlords and capitalists benefit because the inflow of refugees increases derived demand for land and capital and supply of labor. By contrast, workers in these two countries lose as refugees compete for jobs and put downward pressure on wages. In Syria, although all economic agents lose in real terms, landowners are hardest hit as people flee the country in search of safety. The results suggest that the war in Syria has triggered a nearly 50% decline in real rental rates and about 20% decline in wages and capital rental rates. The conflict is also associated with a rise in resource rents to varying degrees within the Levant, except Syria where the embargo limits returns to resources.

Table 6 Real price changes (%)

	Turkey		Egypt		Jordan		Lebanon		Syria		Iraq	
	Disinte-gration	Conflict	Disinte-gration	Conflict	Disinte-gration	Conflict	Disinte-gration	Conflict	Disinte-gration	Conflict	Disinte-gration	Conflict
Land	-4.1	1.6	-19.3	-0.8	-17.9	-2.5	-4.1	39.5	-15.1	-48.4	-34.7	-6.7
Unskilled Labor	0.2	-0.5	-7.3	-0.1	-5.1	-1.5	-2.2	-9	-4.5	-18.6	-5.9	-20.6
Skilled Labor	-0.6	-0.5	-8.3	-0.1	-6.4	-1.3	-2.4	-9.7	-6.9	-19	-11.2	-20.2
Physical Capital	-1.1	0.2	-7.7	0.1	-5.3	0.7	-2.5	3.4	-2.2	-18.2	-7.2	-12.3
Natural Resources	-4.8	1.8	-12	0.5	-17	3.1	-8.6	30.1	-18	-16.4	-12.8	5.3

Whereas in Syria the conflict has much stronger effect on real returns of different agents in the model (landowners, workers, capitalists) than the associated trade disintegration, elsewhere in the Levant the opposite is observed (Table 6). The foregone services integration is the main reason for the significant drop in rental and wage rates in Iraq, Egypt, Jordan, Lebanon, and

Turkey. As barriers to trade in services increase, factor productivity deteriorates leading to declines in real factor returns, especially land and resource rents.

4.4 Pure general equilibrium effects

The global CGE model used in the paper allows for interaction of markets which could lead to significant non-linearities and sizable feedback effects in response to equilibrium price changes, even when underlying preferences and production processes are well behaved. In order to assess the importance of these effects, we compute the pure GE effects, defined as the difference between the nonlinear and the linear solutions of the model.[18] The size of the pure GE results reveals to what extent the CGE model enables us to assess more precisely the effects of war and trade disintegration shocks on different aspects of the Levant economies by capturing the feedback effects between markets. Large pure GE effects would signal that the feedback effects due to changes in prices associated with the war shock are substantial and should not be ignored in such assessments. Furthermore, if the sign of the pure GE effects varies, this would indicate that the linear approach misstates the effects, sometimes overestimating and other times underestimating the "true" effects of war. Thus, it would be difficult to determine the direction of bias.

Table 7 shows the pure GE effects of the Levant war, reflecting both the impact of direct conflict and trade disintegration. The results in the table suggest that the value added of using the CGE model grows with the size of the direct shock. The pure GE effects are small in the case of Turkey because it is least affected by the Levant turmoil and the shock is small relative to the

[18] As mentioned earlier, the linear solution is a first-order approximation of the solution with data coefficients kept constant at initial levels.

size of the economy. However, there are substantial differences between the linear and GE solutions for Iraq and Syria, where the shocks are large, giving rise to large changes. The pure sectoral output effects are large in Syria mostly because of the direct war shocks and in Iraq mostly because of the failed trade integration.

Table 7 Pure GE Effects of War and Trade Disintegration in the Levant

	Direct war effects						Trade disintegration effects						Direct war and trade disintegration effects					
	Turkey	Egypt	Jordan	Lebanon	Syria	Iraq	Turkey	Egypt	Jordan	Lebanon	Syria	Iraq	Turkey	Egypt	Jordan	Lebanon	Syria	Iraq
Per capita welfare (%)	0.0	0.0	0.1	**2.1**	**-2.5**	1.9	-0.1	-1.1	-0.7	0.1	-1.2	**-2.7**	0.0	-1.1	-0.6	**2.3**	**-4.1**	-1.3
Aggregate welfare (US$ m.)	193	1	4	-82	488	11	-334	-1208	-127	-29	-53	-498	-140	-1207	-123	-111	435	-487
Real land prices (%)	0.1	0.0	0.5	1.5	**30.7**	**-2.9**	-0.2	-1.6	**17.0**	-0.9	**7.2**	**-11.0**	-0.1	-1.6	**18.6**	0.9	**36.3**	**-15.6**
Real unskilled wages (%)	0.1	0.0	0.1	1.3	-1.0	**3.7**	0.1	-0.5	-0.8	0.0	-0.6	-0.6	0.1	-0.6	-0.6	1.4	-1.8	**3.1**
Real skilled wages (%)	0.1	0.0	0.2	1.8	-1.5	**3.9**	0.0	-0.8	-0.8	0.1	-0.7	-1.1	0.0	-0.8	-0.6	2.0	**-2.4**	**3.0**
Real capital rental rates (%)	0.0	0.0	0.0	-0.5	**-2.7**	0.7	0.0	-0.6	-0.9	-0.3	-0.9	-0.3	0.0	-0.6	-0.9	-0.8	**-3.7**	0.4
Real resource rents (%)	-0.4	-0.2	0.2	**1.6**	**-8.1**	**-1.9**	-1.0	**-3.7**	**-2.7**	**2.4**	1.4	**-7.8**	-1.4	**-3.9**	**-2.4**	**3.6**	**-8.8**	**-9.2**
Sectoral outputs (%)																		
Primary agriculture	0.0	0.0	0.1	-0.6	**2.7**	-0.8	0.0	-0.6	**2.3**	0.0	-0.3	**-3.2**	0.0	-0.6	**2.4**	-0.6	**2.3**	**-4.1**
Processed food	0.0	0.0	-0.1	-0.5	0.8	-1.6	0.2	1.3	**-2.8**	-0.3	-0.8	**-8.7**	0.2	1.4	**-2.8**	-0.7	0.0	**-10.2**
Gas extraction & distr.	-0.3	0.0	-0.2	-0.8	**12.1**	-0.5	-0.6	-0.6	-0.1	-0.4	0.4	**-3.5**	-1.1	-0.6	-0.2	-1.0	**13.8**	**-4.2**
Oil extraction	-0.5	0.0	0.3	**-2.5**	**-37.5**	**-3.8**	-0.8	-0.7	-0.4	0.4	0.0	-0.7	-1.3	-0.7	-0.4	0.3	0.0	-1.1
Water	0.0	0.0	0.0	-0.3	1.2	-0.2	0.0	-1.5	-0.4	0.0	0.2	**-2.6**	-0.1	-1.4	-0.4	-0.3	1.7	**-3.0**
Other natural resources	0.0	0.0	0.0	-0.2	**-9.2**	-0.1	-0.2	-1.2	0.2	-0.3	1.4	**-1.9**	-0.1	-1.1	0.2	-0.5	**-7.2**	**-2.1**
Petroleum and coal	0.8	0.0	0.0	-1.0	**-3.9**	0.9	1.1	-1.4	-0.7	-1.3	1.5	**-3.6**	2.0	-1.4	-0.7	**-2.1**	**-2.2**	**-2.8**
Electricity	0.0	0.1	0.0	-0.4	1.5	-0.2	-0.1	-1.4	-0.2	-0.2	0.3	**-2.1**	-0.2	-1.3	-0.2	-0.6	**2.2**	**-2.4**
Chemicals and metallurgy	0.0	0.0	0.1	-1.3	-0.5	1.9	-0.1	**-2.8**	0.6	-0.6	-0.1	**4.6**	-0.2	**-2.6**	0.7	-1.8	-0.6	**7.9**
Textiles and apparel	-0.2	0.0	0.0	-0.5	**4.1**	-0.2	-0.3	**-2.1**	-0.2	-0.4	-1.1	**17.9**	-0.5	**-2.1**	-0.2	-0.8	**3.3**	**20.9**
Resource based manufactures	-0.1	0.0	0.1	-0.5	**-2.6**	-0.1	-0.2	-1.5	-0.5	-0.3	0.4	**-4.5**	-0.2	-1.5	-0.5	-0.8	**-2.3**	**-4.9**
Equipment and vehicles	-0.1	0.0	0.1	-0.4	-1.3	0.3	-0.3	-1.6	-0.9	-0.2	0.0	**-5.5**	-0.4	-1.6	-0.8	-0.5	-1.3	**-5.8**
Metal products	-0.1	0.0	0.5	-0.4	**-2.5**	0.1	-0.3	**-2.7**	0.3	-0.2	0.3	**-2.1**	-0.3	**-2.7**	0.8	-0.4	**-2.2**	**-2.2**
Other manufactures	-0.1	0.0	0.0	-1.2	**3.9**	1.9	-0.1	-1.1	0.2	-0.1	-0.7	**-3.7**	-0.1	-1.1	0.2	-1.2	**2.6**	**-2.8**
Construction	0.1	0.0	0.0	-0.1	**3.0**	0.3	-0.1	**-2.2**	-0.8	**-0.1**	-0.4	-1.5	-0.1	**-2.2**	-0.8	-0.1	**3.0**	-1.2
Transport	0.0	0.0	-0.1	-0.6	0.9	**4.2**	0.0	**-3.3**	-1.6	**-1.6**	1.7	**-5.3**	0.1	**-3.2**	-1.7	**-2.1**	**3.7**	0.2
Trade	0.0	0.0	0.0	-0.3	**2.2**	**0.0**	-0.1	-1.2	-0.5	0.0	0.2	**-2.0**	-0.1	-1.3	-0.5	-0.3	**2.7**	**-2.0**
Communications	0.0	0.0	-0.2	-0.8	**2.9**	-1.3	-0.1	**2.3**	1.9	-0.3	**2.4**	**14.9**	-0.1	**2.3**	1.6	-1.3	**7.2**	**10.2**
FIRE	0.0	0.0	-0.1	-0.2	**2.4**	1.0	-0.1	-0.5	-0.4	-0.2	1.2	-1.2	-0.1	-0.5	-0.5	-0.4	**4.9**	0.3
Public services	0.0	0.0	0.1	0.1	1.3	-0.9	-0.1	-0.8	0.0	0.1	0.0	**-2.7**	-0.1	-0.8	0.0	0.2	1.3	**-3.8**
Other Business services	0.0	-0.1	-0.3	-0.1	**-2.5**	-0.1	-0.1	0.4	2.1	0.0	**4.9**	**11.7**	-0.1	0.4	1.5	-0.2	-0.6	**10.6**
Tourism and others	0.0	0.0	-0.1	-0.3	-0.5	0.9	-0.1	-1.6	-0.6	-0.1	0.7	**-3.1**	-0.2	-1.6	-0.7	-0.4	0.3	**-2.1**
Total real output	-0.1	-1.4	-0.9	-0.2	-0.1	-2.0	0.0	0.0	-0.1	-0.3	**4.5**	0.3	-0.1	-1.6	-1.0	-0.5	**4.9**	-1.9

Note: Changes greater than 2% are highlighted in bold. Numbers represent differences between the GE and linear solutions b calculated as $((1+b_{GE})/(1+b_L)-1)*100$, where L stands for linear solution.

Furthermore, the pure GE effects differ not only in size but also in sign, suggesting that a linear solution would either underestimate or overestimate the effect of war on key indicators of interest. These differences are large in the cases of per capita welfare in Syria, real factor prices and sectoral outputs in Syria and Iraq. The linear solution significantly overstates the decline of real land prices in Syria and understates it in Iraq, correspondingly exaggerating and understating

the expansion of sectors intensive in land use. In the case of Iraq, the linear solution overstates the decline in wages and therefore understates the decline in labor intensive sectors. In the cases of Jordan, Lebanon, and Egypt, the deviations between the results from the linear and GE solutions are mostly small (below 2%).

5. Summary and conclusions

The paper quantifies the economic effects of the Levant conflict using a global computable general equilibrium model with new details on the Levant economies. The analysis factors in both the direct economic effects of the Syrian war and the advance of ISIS and its opportunity costs due to foregone deep trade integration initiatives in the region. Unlike less formal approaches, the CGE framework ensures consistency, includes important sectoral detail, and captures second-order feedback effects, which are most significant for Syria and Iraq. In addition, the paper develops a modified version of the GTAP database with economic and trade detail pertinent to the Levant economies and accurately reflecting trade preferences on the eve of the Syria war.

The analysis suggests that Syria and Iraq bear the brunt of the direct war costs, losing 14% and 16% in per capita welfare, respectively. All other Levant economies lose in per capita terms, but not in aggregate terms because the inflows of refugees boost population numbers, and therefore consumption, investment, and labor supply. Lebanon's per capita welfare losses reach close to 11%, while those of Turkey, Egypt, and Jordan do not surpass 1.5%. The difference between aggregate and per capita welfare effects have been most pronounced in Lebanon, where the

increase in the refugee-to-citizen ratio is greatest, and minimal for Turkey and Egypt, where refugees have remained a small share of the population.

The direct effects of the Levant war are an understatement of the real economic costs of disintegration in the Levant. If the costs of foregone regional trade integration are included then the total costs of war for Syria and Iraq almost double, reaching 23% and 28%, respectively, and escalate to 10% for Egypt and 9% for Jordan. The failed services liberalization is a major source of trade-related losses. Furthermore, the average welfare effects are not indicative of the incidence within countries. In Syria, all economic agents are hurt but landowners lose the most as derived demand for land declines dramatically reflecting the outflow of refugees. By contrast, in Lebanon and Turkey land and capital owners benefit while workers lose because the inflows of refugees put pressure on demand for goods and services and depress wages by augmenting labor supply. Finally, the pure GE effects of war and foregone liberalization differ in sign and size and are large for Syria and Iraq, which experience the largest shocks. The results validate the value added of using a CGE framework as part of this assessment and suggest that conventional, linear approaches would misstate the "true" effects of war, making it difficult to determine the direction of bias, especially for those most affected by the shock.

Some caveats are important. The simulation results are indicative of the qualitative changes likely to occur as a result of conflict and the absence of deep trade integration in the region. The magnitude of the shocks reflects events as of mid-2014 and the magnitude of the effects will change depending on the course of the war. In this assessment, we assume that ISIS has not captured the main oil extractive facilities in Southern Iraq. If this were to happen, Iraq's welfare, output, and export losses would be much larger in magnitude than those portrayed here. It is important to note that the analysis does not factor in several types of costs. We have not assessed

the fiscal costs of delivering basic services to refugees in receiving countries; these costs could be substantial for Jordan, Lebanon, and Turkey. The costs of replenishing depleted human and physical capital in Syria would also be sizable. We ignore important investment-growth links that may amplify the effects discussed here.

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Appendix A: Data Sources

Appendix Table A1: Data sources for tariff duties

Importing country	Egypt, Arab Republic of	Tunisia	Morocco	Yemen	West Bank and Gaza
Exporting source					
Morocco	WITS (Inferred from exports, 2007)&WTO (non-MFN rates) 81.51 % coverage; WITS (Imports, 2008)&WTO (non-MFN rates) 18.49 % coverage	WITS&WTO (non-MFN rates) 99.99 % coverage		WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage
Jordan	WITS (Inferred from exports, 2007)&WTO (non-MFN rates) 54.54 % coverage; WITS (Imports, 2008)&WTO (non-MFN rates) 43.41 % coverage; WITS (Inferred from exports, 2007)&WTO (MFN rates) 2.05 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 97.02 % coverage; WITS&Reciprocal (WITS (Imports, 2007)) 2.98 % coverage
West Bank and Gaza	WITS (Inferred from exports, 2007)&WTO (non-MFN rates) 60.64 % coverage; WITS (Imports, 2008)&WTO (non-MFN rates) 39.36 % coverage		WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	
Turkey	WITS (Inferred from exports, 2007)&Reciprocal (WITS (Inferred from exports)) 30.96 % coverage; WITS (Inferred from exports)&WTO (non-MFN rates) 28.71 % coverage; WITS (Imports, 2008)&WTO (MFN rates) 21.73 % coverage; WITS (Inferred from exports)&WTO (MFN rates) 10.72 % coverage; WITS (Imports, 2008)&WTO (non-MFN rates) 6.77 % coverage; WITS (Imports, 2008)&Reciprocal (WITS (Imports, 2008)) 1.06 % coverage	WITS&WTO (MFN rates) 57.26 % coverage; WITS&Reciprocal (WITS (Imports, 2007)) 42.74 % coverage	WITS&WTO (non-MFN rates) 77.25 % coverage; WITS&Reciprocal (WITS (Imports, 2007)) 21.45 % coverage; WITS&WTO (MFN rates) 1.31 % coverage	WITS&GTAP 92.03 % coverage; WITS&Reciprocal (WITS (Imports, 2007)) 7.97 % coverage	WITS&GTAP 87.61 % coverage; WITS&Reciprocal (WITS (Imports, 2007)) 12.39 % coverage
Syrian Arab Republic	WITS (Inferred from exports, 2007)&WTO (non-MFN rates) 66.89 % coverage; WITS (Imports, 2008)&WTO (non-MFN rates) 33.1 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	
Gulf Cooperation Council	WITS (Inferred from exports, 2007)&WTO (non-MFN rates) 93.87 % coverage; WITS (Imports, 2008)&WTO (non-MFN rates) 5.86 % coverage	WITS&WTO (non-MFN rates) 99.99 % coverage	WITS&WTO (non-MFN rates) 99.96 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 99.72 % coverage
Egypt, Arab Republic of		WITS&WTO (non-MFN rates) 99.99 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage
Libya	WITS (Imports, 2008)&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	
Tunisia	WITS (Inferred from exports, 2007)&WTO (non-MFN rates) 73.71 % coverage; WITS (Imports, 2008)&WTO (non-MFN rates) 26.29 % coverage		WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage
European Union	WITS (Inferred from exports, 2007)&Reciprocal (WITS (Inferred from exports, 2007)) 38.47 % coverage; WITS (Inferred from exports, 2007)&WTO (non-MFN rates) 37.16 % coverage; WITS (Inferred from exports, 2007)&WTO (MFN rates) 23.1 % coverage; WITS (Imports, 2008)&WTO (non-MFN rates) 0.59 % coverage	WITS&Reciprocal (WITS (Imports, 2007)) 67.5 % coverage; WITS&WTO (MFN rates) 32.5 % coverage	WITS&Reciprocal (WITS (Imports, 2007)) 53.67 % coverage; WITS&WTO (non-MFN rates) 45.29 % coverage; WITS&WTO (MFN rates) 1.04 % coverage	WITS&GTAP 81.38 % coverage; WITS&Reciprocal (WITS (Imports, 2007)) 18.62 % coverage	WITS&GTAP 67.24 % coverage; WITS&Reciprocal (WITS (Imports, 2007)) 32.76 % coverage
Iraq	WITS (Imports, 2008)&WTO (non-MFN rates) 100 % coverage		WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	
Yemen	WITS (Inferred from exports, 2007)&WTO (non-MFN rates) 90.75 % coverage; WITS (Imports, 2008)&WTO (non-MFN rates) 9.25 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage		
Lebanon	WITS (Inferred from exports, 2007)&WTO (non-MFN rates) 71.2 % coverage; WITS (Imports, 2008)&WTO (non-MFN rates) 28.79 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage
Algeria	WITS (Inferred from exports, 2007)&WTO (non-MFN rates) 97.96 % coverage; WITS (Imports, 2008)&WTO (non-MFN rates) 2.04 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	

Note: Unless specified otherwise, all information from WITS refers to imports for 2007.

Appendix Table A1: Data sources for tariff duties (contd.)

Importing country / Export source	Algeria	Libya	European Union	Gulf Cooperation Council
Morocco	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&EUROSTAT 91.89 % coverage; WITS&GTAP 4.47 % coverage; WITS&WTO (MFN rates) 3.62 % coverage	WITS&WTO (non-MFN rates) 100 % coverage
Jordan	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&EUROSTAT 96.39 % coverage; WITS&GTAP 2.24 % coverage; WITS&WTO (MFN rates) 1.37 % coverage	WITS&WTO (non-MFN rates) 100 % coverage
West Bank and Gaza	WITS&WTO (non-MFN rates) 100 % coverage		WITS&WTO (MFN rates) 47.9 % coverage; WITS&EUROSTAT 41.1 % coverage; WITS&GTAP 11.01 % coverage	WITS&WTO (non-MFN rates) 100 % coverage
Turkey	WITS&WTO (MFN rates) 80.99 % coverage; WITS&Reciprocal (WITS (Imports, 2007)) 19.01 % coverage	WITS&Country sources 100 % coverage	WITS&EUROSTAT 90.83 % coverage; WITS&WTO (MFN rates) 8.89 % coverage	WITS&WTO (MFN rates) 80.76 % coverage; WITS&Reciprocal (WITS (Imports, 2007)) 19.17 % coverage
Syrian Arab Republic	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (MFN rates) 80.78 % coverage; WITS&EUROSTAT 16.5 % coverage; WITS&GTAP 2.72 % coverage	WITS&WTO (non-MFN rates) 100 % coverage
Gulf Cooperation Council	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (MFN rates) 98.36 % coverage; WITS&Reciprocal (WITS (Imports, 2007)) 1.62 % coverage	WITS&WTO (non-MFN rates) 99.13 % coverage; WITS&WTO (MFN rates) 0.87 % coverage
Egypt, Arab Republic of	WITS&WTO (non-MFN rates) 99.17 % coverage; WITS&WTO (MFN rates) 0.83 % coverage	WITS&WTO (non-MFN rates) 99.99 % coverage	WITS&EUROSTAT 97.48 % coverage; WITS&WTO (MFN rates) 1.65 % coverage; WITS&Reciprocal (WITS (Imports, 2007)) 0.57 % coverage	WITS&WTO (non-MFN rates) 99.99 % coverage
Libya	WITS&WTO (non-MFN rates) 100 % coverage		WITS&WTO (MFN rates) 89.44 % coverage; WITS&Reciprocal (WITS (Imports, 2007)) 10.55 % coverage	WITS&WTO (non-MFN rates) 100 % coverage
Tunisia	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&EUROSTAT 95.3 % coverage; WITS&GTAP 3.85 % coverage; WITS&WTO (MFN rates) 0.85 % coverage	WITS&WTO (non-MFN rates) 99.97 % coverage
European Union	WITS&WTO (MFN rates) 51.36 % coverage; WITS&Reciprocal (WITS (Imports, 2007)) 48.64 % coverage	WITS&Country sources 100 % coverage	WITS&WTO (MFN rates) 96.56 % coverage; WITS&GTAP 3.44 % coverage	WITS&Reciprocal (WITS (Imports, 2007)) 51.6 % coverage; WITS&WTO (MFN rates) 48.09 % coverage
Iraq	WITS&WTO (non-MFN rates) 100 % coverage		WITS&WTO (MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage
Yemen	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (MFN rates) 99.92 % coverage	WITS&WTO (non-MFN rates) 100 % coverage
Lebanon	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&EUROSTAT 90.64 % coverage; WITS&WTO (MFN rates) 7.27 % coverage; WITS&GTAP 2.08 % coverage	WITS&WTO (non-MFN rates) 99.98 % coverage
Algeria		WITS&WTO (non-MFN rates) 100 % coverage	WITS&EUROSTAT 99.42 % coverage; WITS&WTO (MFN rates) 0.56 % coverage	WITS&WTO (non-MFN rates) 100 % coverage

Note: Unless specified otherwise, all information from WITS refers to imports for 2007.

Appendix Table A1: Data sources for tariff duties (contd.)

Import destination / Export Source	Iraq	Jordan	Lebanon	Syrian Arab Republic	Turkey
Morocco	WITS (Inferred from exports, 2007)&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 59.08 % coverage; WITS&WTO (MFN rates) 40.28 % coverage; WITS&Reciprocal (WITS (Imports, 2007)) 0.64 % coverage
Jordan	WITS (Inferred from exports, 2007)&WTO (non-MFN rates) 99.15 % coverage; WITS (Inferred from exports, 2007)&Reciprocal (WITS, Inferred from exports, 2007) 0.85 % coverage		WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 99.9 % coverage	WITS&WTO (non-MFN rates) 80.73 % coverage; WITS&Reciprocal (WITS (Imports, 2007)) 11.59 % coverage; WITS&WTO (MFN rates) 7.68 % coverage
West Bank and Gaza		WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage		WITS&WTO (MFN rates) 97.78 % coverage; WITS&WTO (non-MFN rates) 2.22 % coverage
Turkey	WITS (Inferred from exports, 2007)&Country sources 47.08 % coverage; WITS (Inferred from exports, 2007)&Reciprocal (WITS (Inferred from exports, 2007)) 39.36 % coverage; WITS (Inferred from exports, 2007)&GTAP 13.56 % coverage	WITS&WTO (MFN rates) 76.89 % coverage; WITS&Reciprocal (WITS (Imports, 2007)) 23.11 % coverage	WITS&Country sources 73.77 % coverage; WITS&Reciprocal (WITS (Imports, 2007)) 22.96 % coverage; WITS&GTAP 3.27 % coverage	WITS&Reciprocal (WITS (Imports, 2007)) 51.59 % coverage; WITS&Country sources 32.27 % coverage; WITS&GTAP 16.14 % coverage	
Syrian Arab Republic	WITS (Inferred from exports, 2007)&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage		WITS&WTO (MFN rates) 97 % coverage; WITS&Reciprocal (WITS (Imports, 2007)) 3 % coverage
Gulf Cooperation Council	WITS (Inferred from exports, 2007)&WTO (non-MFN rates) 91.11 % coverage; WITS (Inferred from exports, 2007)&Reciprocal (WITS (Inferred from exports, 2007)) 8.89 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 99.97 % coverage	WITS&WTO (non-MFN rates) 99.91 % coverage	WITS&WTO (MFN rates) 70.72 % coverage; WITS&WTO (non-MFN rates) 29.21 % coverage
Egypt, Arab Republic of	WITS (Inferred from exports, 2008)&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 59 % coverage; WITS&WTO (MFN rates) 40.81 % coverage
Libya		WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (MFN rates) 80.11 % coverage; WITS&WTO (non-MFN rates) 15.71 % coverage; WITS&Reciprocal (WITS (Imports, 2007)) 4.18 % coverage
Tunisia	WITS (Inferred from exports, 2007)&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 89.82 % coverage; WITS&WTO (MFN rates) 10.18 % coverage
European Union	WITS (Inferred from exports, 2007)&Reciprocal (WITS (Inferred from exports, 2007)) 48.22 % coverage; WITS (Inferred from exports, 2007)&Country sources 43.7 % coverage; WITS (Inferred from exports, 2007)&GTAP 8.08 % coverage	WITS&WTO (MFN rates) 69.19 % coverage; WITS&Reciprocal (WITS (Imports, 2007)) 30.7 % coverage	WITS&Reciprocal (WITS (Imports, 2007)) 70.3 % coverage; WITS&Country sources 28.2 % coverage; WITS&GTAP 1.5 % coverage	WITS&Reciprocal (WITS (Imports, 2007)) 79.14 % coverage; WITS&Country sources 11.21 % coverage; WITS&GTAP 9.66 % coverage	WITS&WTO (non-MFN rates) 75.47 % coverage; WITS&WTO (MFN rates) 21.57 % coverage; WITS&Reciprocal (WITS (Imports, 2007)) 2.84 % coverage
Iraq		WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (MFN rates) 88.43 % coverage; WITS&WTO (non-MFN rates) 11.27 % coverage
Yemen	WITS (Inferred from exports, 2007)&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (MFN rates) 100 % coverage
Lebanon	WITS (Inferred from exports, 2007)&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 99.69 % coverage	WITS&WTO (MFN rates) 99.85 % coverage
Algeria	WITS (Inferred from exports, 2007)&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (non-MFN rates) 100 % coverage	WITS&WTO (MFN rates) 91.06 % coverage; WITS&WTO (non-MFN rates) 8.94 % coverage

Note: Unless specified otherwise, all information from WITS refers to imports for 2007.

Appendix B: Bilateral Tariff Protection in the Middle East and North Africa

Appendix Table B1: Turkey's tariff protection by source and product

Commodity	Primary agriculture	Food processing	Gas extraction and distribution	Oil extraction	Oth. natural resource extraction	Petroleum, coal products	Electricity generation & distribution	Chemical industry	Textiles and apparel	Resource-based manu-facturing	Equipment, vehicles and machinery	Metal products	Other manu-factures	Total
Morocco	25%	24%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Jordan	67%	3%	0%	0%	0%	0%	0%	1%	3%	0%	0%	0%	0%	1%
West Bank and Gaza	0%	55%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Syrian Arab Republic	10%	24%	0%	0%	0%	4%	0%	4%	6%	9%	2%	0%	2%	3%
Gulf Cooperation Council	1%	62%	0%	0%	0%	0%	0%	3%	5%	1%	0%	1%	0%	1%
Egypt, Arab Republic of	6%	43%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%
Libya	0%	0%	0%	0%	1%	0%	0%	0%	0%	4%	0%	1%	0%	0%
Tunisia	13%	34%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
European Union	13%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Iraq	11%	12%	0%	0%	0%	0%	0%	1%	6%	1%	0%	1%	0%	0%
Iran	37%	35%	0%	0%	1%	0%	0%	2%	5%	1%	3%	0%	0%	0%
Yemen	84%	38%	0%	0%	0%	1%	0%	0%	12%	8%	2%	4%	0%	51%
Lebanon	0%	16%	0%	0%	0%	0%	0%	1%	7%	0%	1%	3%	1%	1%
Algeria	2%	5%	0%	0%	0%	0%	0%	0%	4%	1%	0%	1%	0%	0%
China	17%	49%	0%	0%	0%	0%	0%	2%	5%	3%	0%	0%	0%	2%
India	5%	54%	0%	0%	1%	0%	0%	1%	4%	1%	2%	1%	0%	3%
Japan	18%	47%	0%	0%	0%	4%	0%	4%	5%	2%	4%	3%	5%	4%
Latin America	35%	28%	0%	0%	1%	0%	0%	1%	2%	1%	1%	1%	4%	8%
Newly industrialized countries	21%	31%	0%	0%	0%	4%	0%	4%	7%	1%	3%	3%	25%	4%
Sub-Saharan Africa	8%	21%	0%	0%	0%	0%	0%	1%	5%	1%	1%	0%	0%	2%
Rest of Asia	75%	21%	0%	0%	0%	0%	0%	1%	5%	2%	2%	0%	0%	5%
Rest of Europe and FSU	22%	35%	0%	0%	0%	0%	0%	4%	4%	0%	0%	0%	0%	6%
Rest of OECD	5%	19%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	0%
Russian Federation	30%	23%	0%	0%	0%	0%	0%	5%	2%	0%	1%	0%	0%	2%
USA	12%	20%	0%	0%	0%	3%	0%	2%	7%	0%	2%	2%	306%	6%

Appendix Table B2: Egypt's tariff protection by source and product

Commodity	Primary agriculture	Food processing	Gas extraction and distribution	Oil extraction	Oth. natural resource extraction	Petroleum, coal products	Electricity generation & distribution	Chemical industry	Textiles and apparel	Resource-based manufa-cturing	Equipment, vehicles and machinery	Metal products	Other manu-factures	Total
Morocco	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Jordan	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
West Bank and Gaza	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turkey	1%	9%	0%	0%	0%	0%	0%	2%	3%	3%	1%	4%	3%	2%
Syrian Arab Republic	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Gulf Cooperation Council	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Libya	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Tunisia	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
European Union	0%	53%	1%	0%	0%	0%	0%	0%	1%	1%	0%	1%	1%	2%
Iraq	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Iran	8%	7%	0%	0%	2%	5%	0%	2%	20%	11%	15%	12%	0%	6%
Yemen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lebanon	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Algeria	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
China	10%	31%	0%	0%	2%	11%	0%	8%	29%	25%	9%	16%	15%	16%
India	10%	6%	0%	5%	4%	5%	0%	6%	15%	14%	14%	13%	21%	10%
Japan	3%	9%	0%	0%	2%	5%	0%	9%	13%	12%	23%	11%	20%	19%
Latin America	3%	5%	0%	0%	1%	9%	0%	9%	16%	10%	8%	14%	9%	6%
Newly industrialized countries	15%	5%	0%	0%	0%	7%	0%	6%	16%	13%	20%	13%	15%	15%
Sub-Saharan Africa	1%	218%	1%	0%	2%	6%	0%	2%	17%	8%	13%	13%	5%	21%
Rest of Asia	9%	11%	0%	0%	2%	6%	0%	11%	16%	14%	15%	15%	20%	12%
Rest of Europe and FSU	2%	4%	0%	1%	2%	5%	0%	2%	13%	6%	6%	11%	5%	2%
Rest of OECD	2%	17%	0%	0%	1%	4%	0%	10%	17%	9%	7%	12%	13%	9%
Russian Federation	2%	3%	0%	0%	0%	5%	0%	3%	12%	6%	11%	11%	16%	3%
USA	2%	9%	0%	0%	1%	8%	0%	8%	15%	8%	6%	12%	16%	5%

Appendix Table B3: Lebanon's tariff protection by source and product

Commodity	Primary agriculture	Food processing	Gas extraction and distribution	Oil extraction	Other natural resource extraction	Petroleum, coal products	Electricity generation & distribution	Chemical industry	Textiles and apparel	Resource-based manufa-cturing	Equipment, vehicles and machinery	Metal products	Other manu-factures	Total
Morocco	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Jordan	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
West Bank and Gaza	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%
Turkey	4%	12%	0%	5%	0%	3%	0%	6%	4%	6%	6%	5%	4%	5%
Syrian Arab Republic	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Gulf Cooperation Council	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Egypt, Arab Republic of	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Libya	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Tunisia	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
European Union	2%	7%	0%	4%	1%	4%	0%	4%	3%	3%	3%	4%	1%	4%
Iraq	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Iran	5%	7%	0%	5%	2%	2%	0%	6%	5%	4%	5%	5%	5%	5%
Yemen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Algeria	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
China	15%	14%	0%	5%	2%	0%	0%	7%	4%	15%	7%	6%	7%	7%
India	4%	4%	0%	5%	3%	2%	0%	6%	4%	12%	4%	6%	0%	3%
Japan	24%	14%	0%	5%	0%	2%	0%	4%	4%	4%	7%	5%	6%	7%
Latin America	2%	4%	0%	5%	3%	5%	0%	5%	6%	7%	6%	6%	2%	3%
Newly industrialized countries	5%	12%	0%	5%	2%	6%	0%	3%	2%	5%	9%	5%	4%	6%
Sub-Saharan Africa	6%	20%	1%	5%	0%	0%	0%	1%	5%	1%	5%	4%	5%	3%
Rest of Asia	6%	7%	0%	5%	1%	2%	0%	5%	3%	11%	9%	6%	4%	7%
Rest of Europe and FSU	3%	5%	0%	5%	0%	2%	0%	5%	5%	4%	5%	6%	7%	3%
Rest of OECD	3%	5%	0%	5%	3%	2%	0%	1%	3%	3%	5%	5%	3%	2%
Russian Federation	1%	11%	0%	5%	0%	2%	0%	5%	6%	1%	6%	5%	3%	1%
USA	1%	6%	0%	5%	2%	2%	0%	5%	3%	2%	5%	5%	3%	3%

Appendix Table B4: Jordan's tariff protection by source and product

Commodity	Primary agriculture	Food processing	Gas extraction and distribution	Oil extraction	Other natural resource extraction	Petroleum, coal products	Electricity generation & distribution	Chemical industry	Textiles and apparel	Resource-based manufa-cturing	Equipment, vehicles and machinery	Metal products	Other manu-factures	Total
Morocco	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
West Bank and Gaza	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turkey	7%	47%	30%	5%	12%	0%	0%	5%	7%	7%	9%	4%	6%	9%
Syrian Arab Republic	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Gulf Cooperation Council	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Egypt, Arab Republic of	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Libya	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Tunisia	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
European Union	1%	5%	30%	0%	1%	0%	0%	4%	2%	2%	1%	4%	1%	2%
Iraq	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Iran	25%	20%	30%	5%	3%	13%	0%	6%	20%	11%	7%	11%	30%	16%
Yemen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lebanon	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Algeria	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
China	18%	8%	30%	5%	6%	7%	0%	7%	5%	19%	8%	12%	25%	8%
India	24%	7%	30%	8%	2%	10%	0%	2%	8%	13%	3%	10%	25%	7%
Japan	0%	11%	30%	10%	0%	10%	0%	6%	1%	7%	8%	16%	24%	7%
Latin America	6%	9%	30%	5%	25%	10%	0%	7%	2%	6%	8%	17%	18%	8%
Newly industrialized countries	0%	10%	30%	5%	17%	10%	0%	3%	2%	12%	7%	10%	7%	6%
Sub-Saharan Africa	7%	100%	30%	5%	10%	10%	0%	2%	3%	5%	13%	14%	24%	54%
Rest of Asia	3%	4%	30%	5%	9%	10%	0%	8%	4%	7%	11%	9%	16%	8%
Rest of Europe and FSU	1%	11%	30%	5%	0%	11%	0%	4%	20%	0%	2%	15%	30%	3%
Rest of OECD	5%	23%	30%	5%	15%	10%	0%	3%	6%	10%	7%	3%	15%	9%
Russian Federation	0%	48%	30%	5%	0%	29%	0%	0%	30%	1%	17%	8%	30%	0%
USA	2%	4%	19%	5%	2%	10%	0%	3%	7%	2%	4%	13%	12%	4%

Appendix Table B5: Syrian Arab Republic's tariff protection by source and product

Commodity	Primary agriculture	Food processing	Gas extraction and distribution	Oil extraction	Other natural resource extraction	Petroleum, coal products	Electricity generation & distribution	Chemical industry	Textiles and apparel	Resource-based manufa-cturing	Equipment, vehicles and machinery	Metal products	Other manufactures	Total
Morocco	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Jordan	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
West Bank and Gaza	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%
Turkey	4%	13%	5%	0%	1%	3%	0%	5%	7%	4%	8%	6%	6%	5%
Gulf Cooperation Council	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Egypt, Arab Republic of	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Libya	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Tunisia	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
European Union	3%	13%	5%	0%	5%	9%	0%	5%	11%	5%	14%	12%	10%	9%
Iraq	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Iran	18%	23%	5%	0%	6%	9%	0%	6%	13%	23%	25%	6%	5%	18%
Yemen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lebanon	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Algeria	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%
China	6%	17%	5%	0%	5%	6%	0%	5%	13%	18%	16%	13%	10%	11%
India	18%	7%	5%	5%	5%	9%	0%	4%	8%	10%	10%	10%	7%	8%
Japan	1%	28%	5%	0%	3%	5%	0%	6%	12%	1%	28%	9%	17%	24%
Latin America	7%	8%	5%	0%	1%	9%	0%	6%	7%	1%	22%	12%	6%	8%
Newly industrialized countries	5%	4%	5%	0%	3%	9%	0%	3%	9%	2%	30%	9%	8%	21%
Sub-Saharan Africa	7%	14%	5%	0%	3%	8%	0%	9%	7%	6%	23%	9%	24%	7%
Rest of Asia	7%	7%	5%	0%	2%	9%	0%	5%	9%	4%	25%	14%	8%	9%
Rest of Europe and FSU	4%	2%	5%	0%	1%	9%	0%	2%	11%	3%	13%	23%	25%	2%
Rest of OECD	1%	8%	5%	0%	1%	9%	0%	2%	7%	3%	9%	12%	25%	7%
Russian Federation	3%	3%	5%	0%	0%	9%	0%	2%	21%	2%	15%	7%	24%	8%
USA	2%	12%	5%	0%	3%	5%	0%	4%	7%	4%	14%	6%	26%	3%

Appendix Table B6: Iraq's tariff protection by source and product

Commodity	Primary agriculture	Food processing	Gas extraction and distribution	Oil extraction	Other natural resource extraction	Petroleum, coal products	Electricity generation & distribution	Chemical industry	Textiles and apparel	Resource-based manufa-cturing	Equipment, vehicles and machinery	Metal products	Other manufa-ctures	Total
Morocco	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Jordan	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
West Bank and Gaza	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%
Turkey	6%	17%	0%	10%	13%	5%	10%	9%	15%	14%	11%	12%	8%	12%
Syrian Arab Republic	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Gulf Cooperation Council	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Egypt, Arab Republic of	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Libya	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Tunisia	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
European Union	5%	22%	10%	8%	13%	5%	10%	7%	13%	12%	8%	11%	12%	9%
Iran	8%	43%	10%	9%	2%	10%	10%	6%	19%	11%	17%	11%	3%	15%
Yemen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lebanon	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Algeria	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
China	2%	14%	10%	1%	19%	5%	10%	9%	17%	19%	16%	11%	16%	15%
India	10%	11%	10%	1%	6%	5%	10%	9%	18%	15%	9%	11%	26%	9%
Japan	75%	47%	10%	10%	1%	5%	10%	9%	13%	12%	14%	9%	22%	14%
Latin America	8%	15%	10%	1%	4%	4%	10%	9%	7%	19%	9%	15%	30%	14%
Newly industrialized countries	3%	26%	10%	1%	3%	7%	10%	9%	24%	11%	13%	9%	8%	16%
Sub-Saharan Africa	14%	28%	10%	1%	1%	6%	10%	11%	9%	17%	10%	8%	16%	10%
Rest of Asia	10%	13%	10%	1%	2%	6%	10%	9%	18%	16%	20%	10%	16%	14%
Rest of Europe and FSU	10%	21%	10%	1%	2%	4%	10%	5%	21%	13%	11%	7%	9%	7%
Rest of OECD	1%	15%	10%	1%	1%	5%	10%	5%	7%	8%	8%	8%	18%	3%
Russian Federation	6%	80%	10%	7%	0%	7%	10%	3%	19%	5%	12%	7%	3%	8%
USA	2%	7%	10%	10%	3%	5%	10%	10%	7%	14%	10%	13%	13%	7%