

WORLD BANK MIDDLE EAST AND NORTH AFRICA REGION

THE IMPACT OF THE SYRIAN CONFLICT ON LEBANESE TRADE



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A World Bank report¹

Note:

Depending on the availability, the analysis uses data up until November 2014.

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THE IMPACT OF THE SYRIAN CONFLICT ON LEBANESE TRADE²

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Executive Summary

The devastating civil war in Syria is arguably one of the major civil conflicts in recent times. The economic effects of the war extend beyond the country's borders affecting also the neighbouring countries. In particular, trade is one of the main channels through which the effects of the crisis are transmitted to neighbouring countries. This report examines the effects of the Syrian war on the Lebanese economy. In doing so, it partly updates and extends the previous economic assessment of the World Bank (2013b) carried out last year.

It uses a variety of analytical instruments to find - perhaps surprisingly – that the Syrian war has so far had a mixed impact on Lebanese trade. It shows that the fall in Lebanese merchandise exports recorded in the period 2011-13 seems to have been caused by factors unrelated to the Syrian war, chiefly the fall in previous stones and jewellery exports particularly to South Africa and Switzerland.

The war has reduced the Syrian demand for goods and services, including those of Lebanese origin. Using custom transaction data we found that, on average, an exporter of goods to Syria before the war lost US\$ 90,000 in exports to Syria by 2012, around a quarter of the average pre-crisis export level to Syria. While this effect is significant, it is much smaller than the effect for Jordanian exporters. This is also confirmed by the gravity analysis, which reveals that the effect of the war on aggregate exports to Syria has been smaller for Lebanon than for Turkey and Jordan.

This effect of the Syrian conflict has been heterogeneous across exporters. It has mainly affected exporters highly exposed to the Syrian market, while it has not had a significant impact on relatively marginal exporters. The heterogeneity is also across sectors. Lebanese exports to Syria in the beverages and tobacco sector, and to some extent food, benefited from the war as they replaced some of the lost production in Syria. For example, exports of wheat to Syria increased 14-fold between 2011 and 2013. On the other hand the crisis had a particularly negative impact on exporters of manufactured goods, a result common to Jordanian exporters as well, and of mineral fuels.

The war has also increased the cost of trading through Syria, which is the only overland connection with the rest of the world for Lebanon. This effect has caused the re-direction of much of the trade through Syria towards sea trade mainly through the Port of Beirut, containing the effect of the increased trade costs. The existing spare capacity of the port has allowed to avoid delays from the additional traffic. On the other hand, the data do not show any clear effects of the Syrian war on Lebanese merchandise imports. Firm-level exports to countries served through Syria have declined somewhat although by less than Syrian exports.

On the other hand the Syrian war has also generated opportunities for Lebanese exporters to replace the loss of Syrian production in the Syrian and other markets. The firm-level analysis shows that the war has spurred some exports to Syria among Lebanese exporters that were not previously exporting to the country. This replacement effect was large enough to offset the negative effect of the war for exporters via the loss in the Syrian market. Conversely Jordanian exporters did not benefit significantly from this replacement effect, thus the effect of the war has been on average negative for the individual Jordanian exporter. This confirms the evidence from the gravity analysis of the greater ability of the Lebanese traders relative to the other Syrian neighbours to adapt to the war environment in Syria.

Services dominate the Lebanese export sectors, being 4-5 times larger than goods' exports. Thus, much of the overall impact of the civil war on trade depends on the effects on services. Unfortunately the data quality does not allow a neat assessment of these effects. In particular data from different sources paint

a different trend in services exports in the 2011-13 period. We present a wealth of other data on domestic services turnover and on foreign investments to provide suggestive evidence that the declining trend in services exports derived from Banque du Liban (BdL) data may be less accurate than the stable or increasing trend derived from the International Monetary Fund (IMF) or the United Nations Conference on Trade and Development (UNCTAD) data.

Excluding Syrian and Lebanese nationals, the number of visitors into Lebanon declined by 23% between 2010 and 2011 and further 15% in 2012 and 2% in 2013. The first four months of 2014 witnessed a further decline of 16% vis-à-vis the same period in 2013. To a large extent, this reflects bans, formal or informal, that several countries have placed on travel to Lebanon due to security incidents and political disagreements, arguably mostly the result of infighting in Syria spilling over to Lebanon.

While tourism receipts have suffered the fallout of the Syrian war, the other services sectors have mostly proven resilient to the war. Contrary to most economies in the region, Lebanon's services exports do not rely exclusively on exports of transport and tourism, but rather expand to cover modern sectors like financial, real estate and business services. Overall non tourism services exports have grown unabatedly during the Syrian war. Even the real estate sector that contracted in 2010-12, most likely due to the spillovers of the Syrian conflict, rebounded in 2013. And the financial sector has remained resilient throughout the crisis despite some loss of profitability of the Syrian affiliates of major Lebanese banks.

The VAR analysis suggests that at least part of the resilience of services exports and production is related to the increased demand for Lebanese services spurred by Syrian refugees. While the large refugees' inflow has had a wider socio-economic impact some of which the World Bank (2013b) has discussed in detail, our analysis also shows that a 1% increase in refugees' stock increases services exports by about 1.5% after two months. This positive demand channel through which refugees affect the local host economy is not uncommon in refugees' hosting population, for example in Tanzania with refugees from Burundi and Rwanda (Maystadt and Verwimp, 2014).

There are a few early signs of recovery for the tradable sector, which was negatively affected by the Syrian war, although it remains far too early to assess whether this recovery will prove sustainable. However, the deterioration of the security conditions may quickly reverse these early signs. The trade prospects for Lebanon will crucially depend on a number of factors mainly linked to the Syrian war and to its regional spillovers: domestic security conditions, the evolution of the war in Syria and of the incipient war in Iraq, and the economic and social sustainability of the Syrian refugees. A close and continuous monitoring of these trends is necessary to prevent possible negative fallout of the Syrian civil conflict on the neighbouring economies and beyond.

The report suggests some tentative policy implications of the findings, including to provide support to affected firms to diversify away from Middle Eastern markets and to workers laid off by firms negatively affected by the conflict; to assist with the development of alternative arrangements to overland trade; and to facilitate a more formal integration of the Syrian refugees into the Lebanese economy.

1. Introduction

The devastating civil war in Syria is arguably one of the major civil conflicts in recent times. The conflict started with protests in March 2011 and soon after escalated to a violent internal war with no end in sight to this date. The conflict has by the end of 2014 caused well in excess of 150,000 fatalities, and 6 million internally displaced people (UN), and led 3 million refugees to move out of the country (UNHCR). Beyond the human tragedy, the conflict has disrupted the functioning of the economy in many ways. It has destroyed infrastructure, prevented children from going to school, closed factories and deterred investments and trade.

The economic effects of the war extend beyond the country's borders affecting also the neighbouring countries. In particular trade is one of the main channels through which the effects of the crisis are transmitted to neighbouring countries. For example, the demand for goods and services in Syria is likely to have fallen thus affecting the many exporters to Syria in neighbouring countries. Moreover, to the extent that Syria has become harder to cross, the war may have made trade through Syria more difficult. At the same time producers in neighbouring countries may have replaced Syrian producers in Syria and in other markets as their productive assets in Syria were destroyed.

Probably the neighbouring country with strongest links to Syria is Lebanon. Indeed, Syria forms Lebanon's largest border and a main economic conduit to the outside world (figure 1). Organic social and political ties further elevate the relationship between the two countries. Moreover, a Syrian military presence and penetrating political influence over Lebanon lasted about 30 years until 2005, 15 years of which Syria had the dominant say in its neighbour's domestic and foreign affairs. More recently, Lebanon has been experiencing perturbing security and political spillovers from its neighbour's turmoil.

The Syrian crisis represents one of the most serious challenges to stability in Lebanon, which was largely, albeit imperfectly, regained after Lebanon's own civil war ended in 1990. It has also resulted in serious disruptions to some of Lebanon's principal economic drivers, particularly tourism. And yet, growth has remained positive, even as it tumbled from exceptionally high rates prior to 2011; the average real GDP growth rate during the period 2011-2014 was 1.6 percent, compared to 9.2 percent for the period 2007-2010. Lebanon has experienced contraction under less strenuous conditions such as in 1999 when growth was -0.8 percent.

This report examines the effects of the Syrian war on the Lebanese economy via one of the most important channels through which the economic impact of the war occurs, i.e. the trade channel. In doing so, it partly updates and extends the previous economic assessment of Wold Bank (2013b) carried out last year. Focusing specifically on trade allows us to examine in more depth the trade effects than that report was able to do. Indeed, we go beyond the effects on aggregate and sectoral imports and exports to also examine the effects on exports at firms' level, comparing the effects in Lebanon with those in other neighbouring countries, including Jordan, Turkey and Iraq.

The report does not only examine the pattern of goods' trade but it looks at services trade as well. While services are intangible flows not subject to the same physical disruption as trade in goods, services are still affected by the changes in the demand spurred by the conflict. The report shows how services exports such as tourism and real estate have been particularly affected and that these sectors may take some time to recover as the security situation remains unstable.

Moreover, the report also explores the implications of the massive refugees' flow induced by the war on trade and remittance flows. The increase in non-resident population in Lebanon has been equal to over a quarter of the total Lebanese population. This flow has impacted the demand for goods and services as well as the pattern of remittance inflows and outflows. The use of a vector Auto-Regressive (VAR) analysis allows us to examine the impact of the refugee inflows on various such flows.

The report is organized as follows. The next section reviews the literature on the trade impact of civil wars in neighbouring countries, highlighting also the various channels behind this impact; section 3 presents a series of descriptive statistics on the recent trends in Lebanese trade also in relation to the other Syrian neighbours; section 4 develops a gravity-type analysis to investigate more formally the aggregate impact of the Syrian war on Lebanese merchandise trade, comparing it with the impact on the other Syrian neighbours; section 5 complements this analysis with a firm-level difference-in-difference analysis on the impact of the war on Lebanese and Jordanian merchandise exporters; section 6 analyses the impact of the war on various components of the Balance of Payments via the refugees' inflow into Lebanon using a VAR analysis; finally, section 7 summarizes the findings and highlights some of the possible policy implications.

Figure 1: Lebanon and Syria: a close link



2. How civil conflict affects neighbours via trade

The relationship between war and trade has been investigated from various angles. Glick and Taylor (2010) show that war has a persistent and strong negative effect on trade volumes and that commercial losses affect also neutral countries, suggesting that war generate negative externalities on trade. Martin et al. (2008) looks at the effect of trade on the probability of engaging in war. They find that bilateral trade decreases the probability of war between a pair of countries, but that multilateral trade increases the probability of bilateral war because globalization reduces the bilateral dependence for any given country, reducing the cost of a bilateral war.

However, our report is more concerned with the effects of civil conflicts rather than of war between countries. Bayer and Rupert (2004) show that there is a significant negative impact of civil war on the bilateral trade between the afflicted country and trading partners. Ades and Chua (1997) move the focus on neighbouring countries and find evidence that coups and revolutions in a neighbor has a strong negative effect on a country's steady state per-capita income. They identify the disruption of trade flows as one of the main channels of this effect. More recently, Qureshi (2013), by looking at a panel of 145 countries over 58 years, estimates that bilateral trade between neighbouring countries decreases by 12% if one of the countries is involved in an intrastate conflict; whereas bilateral trade decreases by 4% if the conflict involves one of the neighbours of a trading country (without the trading partners being involved). These penalties are even higher for landlocked countries, who rely on countries in conflict for access to global markets (Moore, 2015).

Our project is closest in spirit to Qureshi (2013). Our contribution is that, by focusing on a specific case like the Syrian conflict, we are able to disentangle and quantify alternative mechanisms through which a civil war can affect neighbouring countries' trade. Moreover, we use data both from aggregate trade flows between a large sample of countries and firm level exporters' data for Lebanon and Jordan. Therefore, we can implement two different econometric approaches, one based on gravity analysis and another based on firm level difference-in-difference estimates. This enhances the robustness of our analysis and allows us to exploit different type of variations in the data.

We aim to explore four different potential channels through which the Syrian war can affect neighbours' trade: a *direct effect* where demand from Syria collapses; a *transit effect* where exports towards other countries that are usually transported through Syria need to find alternative routes; a *replacement effect* that can stem either from exporters in Syria moving production to the neighbouring country, or from exporters of the neighbouring countries that substitute for Syrian lost production capacity; a *refugees' effect* that may affect the demand for goods and services in Lebanon due to the inflows of refugees into the country. This effect can thus influence both goods' imports and services' exports (i.e. Lebanese services sold to Syrian nationals in Lebanon). For example Maystadt and Verwimp (2014) show that refugees from Burundi and Rwanda had a long-term aggregate positive impact on the refugees' hosting population in Tanzania.

This assessment does not take into account the political and security spillovers of the war, which are having a clearly negative impact on the Lebanese economy. However, these spillovers are complex to measure and go well beyond the scope of the analysis.

In the next session, we focus on estimating the direct and the transit effect, leaving the assessment of the replacement effect to further studies.

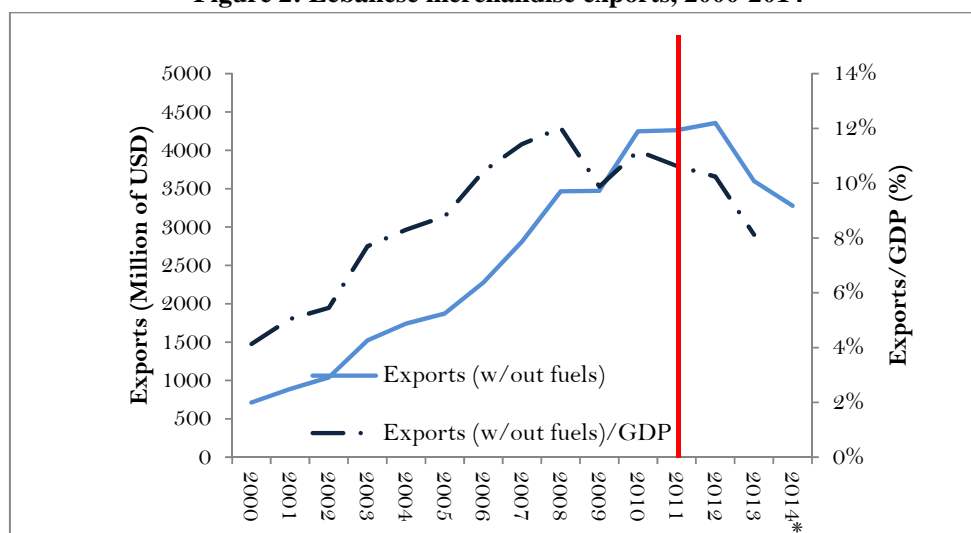
3. Recent trends in trade

Before undertaking a more formal analysis it is useful to map the recent trends in the country's trade sector to have an overall impression of the possible impact of the Syrian conflict on trade. We exclude fuel trade from the figures as that has been subject to various shocks in recent years which are unrelated to the overall performance of the trade sector.³

3.1. Merchandise trade

Merchandise exports have declined markedly since 2012, arresting the robust growth of the previous decade, especially during the 2000-2010 period (Figure 2).⁴ Overall, exports represent a small portion of GDP (~10%), and this share has been declining since 2008. While remaining positive, growth in goods' export dropped in 2011, following a similar drop during the 2008-09 global financial crisis. Since 2012, however, the growth has become negative. To what extent is this trend driven by the role of Syria as an important trading partner for Lebanon? In 2011, Syria was the fifth largest export destination, accounting for 5.4% of total exports.⁵

Figure 2: Lebanese merchandise exports, 2000-2014



* Export data estimated on the basis of Lebanese customs data up to October 2014.

Source: Lebanese Customs, World Development Indicators and World Bank staff estimates.

While the timing of the change in export growth coincided with the Syrian war, a closer look at the export data suggests that the swings in exports of the recent years have been mainly driven by pearls and precious stones and other metals (Table A1 in the Appendix). Figure 3, which shows the main

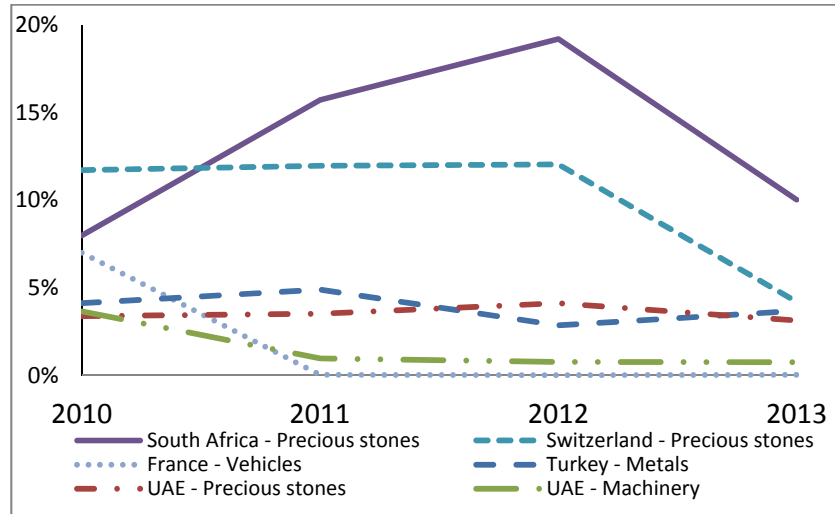
³ In particular, in February 2012 Electricité du Liban (EDL) declared all of its imports of diesel and fuel between January 2010 and February 2012 (worth USD 1.3 bn). These imports were entirely imputed to February 2012 thus biasing the fuel figures through the period. In addition, in 2013, the customs data has been reporting EDL imports of diesel but not of fuel. Finally, there was a dramatic increase in the re-export of fuel from Lebanon to Syria as it temporarily replaced its traditional Syrian suppliers. However, this increase was short-lived and subsided in 2014.

⁴ Exports and imports for 2014 have been estimated on the basis of Lebanese custom data through October 2014. This data has been complemented with estimates for November and December 2014 obtained by applying the percentage change in exports between the period August-October 2014 and August-October 2013 to the export data for November and December 2013.

⁵ This share jumped to 6.6% in 2012 due to the dramatic growth in fuel re-exports.

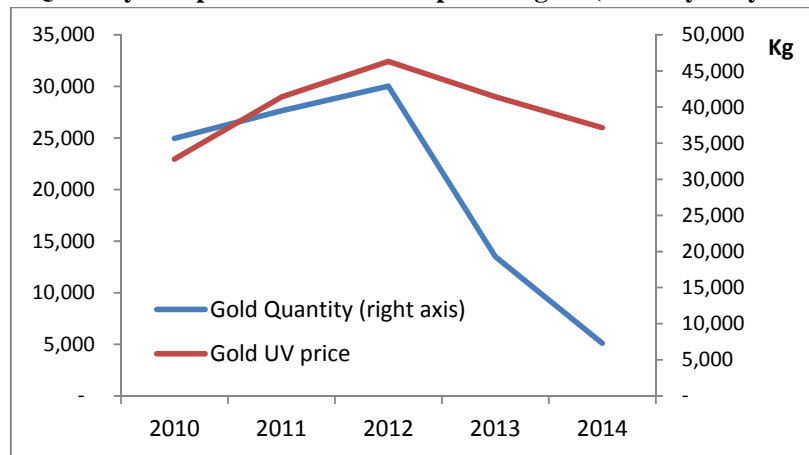
product-destination pairs in terms of export shares, also confirms that the Syrian war does not seem to be the main cause behind the changes in exports of the last years. The drop in exports in 2012-13 is almost entirely explained by the drop in exports of precious stones to South Africa and Switzerland. Exports to South Africa were also the main driver behind the growth in exports in 2010-11 and 2011-12. These changes in precious stones' exports are driven mainly by gold, the largest Lebanese export, whose international demand has fluctuated greatly over the past years. Both the international price of gold and the quantity exported by Lebanon have dropped between 2012 and 2014 (Figure 4).⁶

Figure 3: Main product-destination of Lebanese exports (share of total export value), 2010-13



Source: Lebanese Customs

Figure 4: Quantity and price of Lebanese exports of gold (January-May of each year)

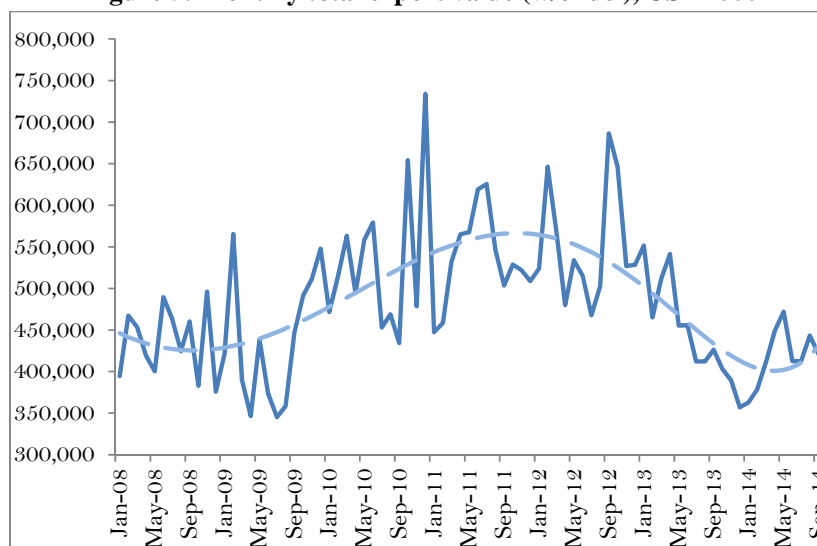


Source: Lebanese Customs

The monthly figures presented in Figure 5 indicate that Lebanese exports may have bottomed out around January-February 2014 and have since experienced a timid recovery. Indeed, the (non fuel) export value in the period August-October 2014 was slightly above that of the previous years.

⁶ For comparability purposes we only consider the first five months of each year, as we only have data on gold quantities and unit values for the first five months of 2014.

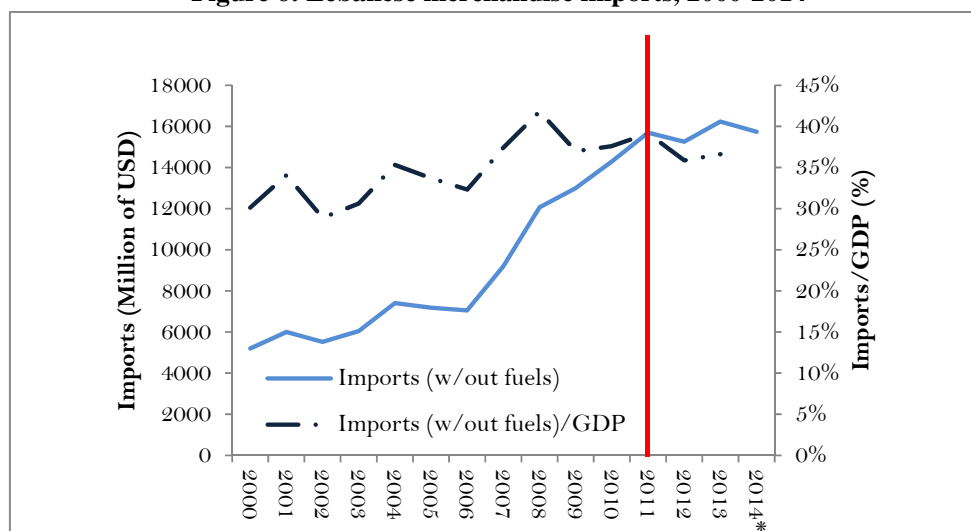
Figure 5: Monthly total export value (w/o fuel), USD ‘000



Source: Lebanese customs

Lebanese merchandise imports experienced a slowdown in growth after 2011 vis-à-vis the previous decade (Figure 4). However, unlike exports imports continued to grow through 2013 with a small expected drop in 2014, while the merchandise imports-GDP ratio (which is 4 times as high as the merchandise export-GDP ratio) decreased after 2011. The relative stability of import values over time is likely to be the product of two competing forces related to the war. On one hand, the refugee inflow into Lebanon has pushed imports upwards due to increased demand for consumption and capital goods (as also shown below). On the other hand, the increased trade costs due to the war have hampered the ability of Lebanese traders to import via land, thus decreasing the import propensity of the economy.

Figure 6: Lebanese merchandise imports, 2000-2014



* Export data estimated on the basis of Lebanese customs data up to October 2014.

Source: Lebanese Customs, World Development Indicators and World Bank staff estimates.

Syria is also important for Lebanese trade as a transit country since a sizable share of Lebanese trade travels through Syria. For example, a third of the non fuel Lebanese exports went to neighbouring

countries in the Middle East, which would be ideally reached overland, and thus, transiting through Syria. The most important export destinations among those countries are United Arab Emirates, Saudi Arabia, Jordan, Iraq, Iran, Kuwait, Oman, Qatar, Bahrain and Turkey, hereafter referred to as the “affected countries”.

Despite Lebanon’s export and import bundles being relatively diversified given its level of GDP (e.g., exporters reach 110 destinations, well above the average for countries of similar size), more than 20% of total exports and about 6% of total imports transit by land through Syria, mainly to and from the Arab markets. These trade flows clear customs in the border cities of Masnaa, by far the most important border for trade through Syria, Abboudieh, Arida, or Kaa (see Figure 7 for the share of exports by customs office and Figure 8 for imports).

The figures show a re-direction of both exports and imports away from Masnaa and Abboudieh especially between 2012 and 2013. On the other hand, Arida and Kaa have been marginal border-posts even before the Syrian war. The main beneficiary of this re-direction has been Port of Beirut (PoB), whose share in total export value jumped to 44% in 2013 (from 28% in 2012), while its share in imports rose to 71% (from 66% in 2012).⁷ However, it seems that this trend away from Syrian border-posts has been partly reversed in the first 10 months of 2014, particularly for exports, as also shown in Figure 9, which reports the overall share of merchandise imports and exports going through Syrian border-posts.

Figure 7: Share of non fuel exports by custom office

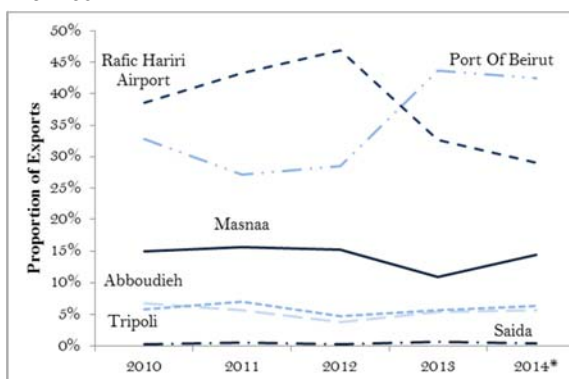
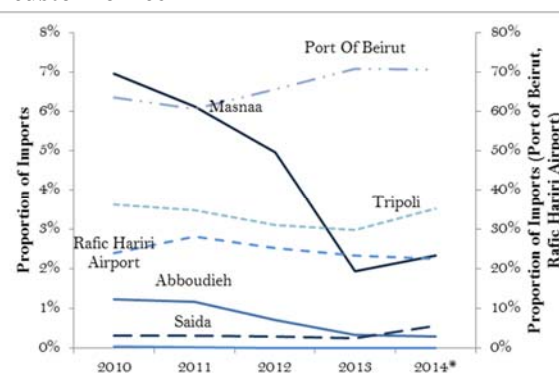


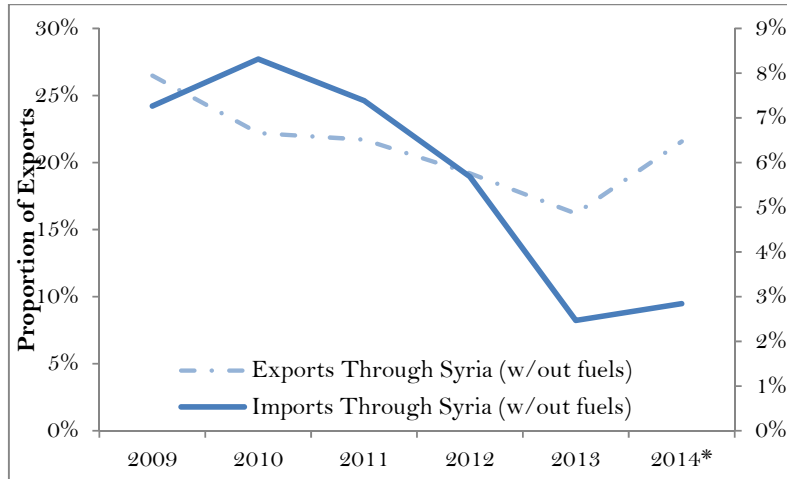
Figure 8: Share of non fuel imports by custom office



Note: data for 2014 until October. Source: Lebanese customs

⁷ In the case of exports, the jump in the PoB’s share is also explained by the reduction in exports via air following the drop in exports of valuable jewellery and precious stones.

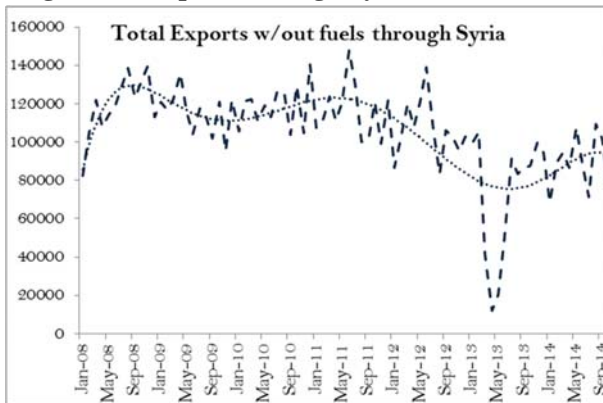
Figure 9: Share of non fuel trade through Syria



Note: data for 2014 until October. Source: Lebanese customs

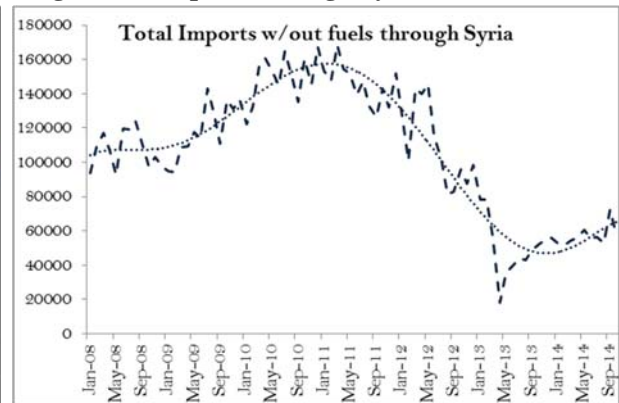
While the share of exports via Syria has started to bounce back in 2014, reaching a similar share to the pre-war period, the level of exports via Syria are still well below 2010-11, as the total export value in 2014 is much lower than before the war. This is clear when looking at the monthly figures for exports (Figure 10) and imports (Figure 11), which show for instance that imports through Syria in October 2014 were a third of the value in October 2010 and less than half than in October 2011. The figures also show that monthly exports and imports through Syria have been increasing since the huge dip in May 2013. This pattern is consistent with interviews with Lebanese firms trading with and through Syria, which suggest a rapid deterioration of the security conditions in Syria in May 2013, followed by slight and relatively steady improvement in the conditions as for instance the road to Damascus – the main trading link to Syria - became more secure.⁸

Figure 10: Exports through Syria, USD ‘000



Source: Lebanese customs

Figure 11: Imports through Syria, USD ‘000



⁸ These accounts are also in line with recent evidence of recovering trade throughout 2014 between Turkey and the northern parts of Syria controlled by the Islamic state (Yalinkilic et al., 2014).

The data suggest that overland trade (both imports and exports) has been severely disrupted by the Syrian war. However, the trend in Lebanese exports to both Syria and the affected countries remained the same as the pre-war period (Figure 12). For imports, the trend to the affected countries was also the same, while imports from Syria dropped dramatically (Figure 13). Taken together, these figures suggest a number of interesting findings. First, Syria has continued to be a destination market for Lebanon throughout the war. As we will see below, there has been a lot of churning in the Syrian demand for Lebanese products with the demand dropping for certain goods but picking up for others as Syrian production was undermined. Overall, Syrian demand for Lebanese products seems to have withstood the crisis. And that seems to have been the case also for the other countries in the region. The fall in overland exports post-2011 suggests that these markets have been served increasingly via air and more importantly via sea. As we explained above, the drop in the Lebanese exports to the rest of the world seems to be unrelated to the Syrian war.

On the other hand, the collapse in Syrian production has led to a dramatic decline in Lebanese imports from Syria, which almost halved between 2010 and 2013 (Figure 13). Other Syrian neighbouring countries, Jordan and Turkey experienced also a reduction in imports from Syria although to different degrees. Turkish imports almost came to a halt (from close to US\$ 700 million in 2011 to less than US\$ 100 million in 2012), while Jordanian imports fell by 30%. Anecdotal evidence gathered through our interviews suggests that the Turkish import collapse may have also been a by-product of the fact that some Syrian firms managed to relocate to Turkey during the war to serve its market and Syria itself.

Jordan and Turkey, unlike Lebanon, saw a significant reduction in exports to Syria following the war (Figure 12). This suggests a different ability to replace Syrian production vis-à-vis Lebanese exports and perhaps a larger drop in the demand for Jordanian and Turkish products, for example, due to the higher incidence of the war on areas close to Jordan and Turkey vis-à-vis Damascus, the main Syrian market for Lebanese products. Exports to the region have not been affected for Jordan as Syria is not a necessary transit between Jordan and most of the region, while Turkish exports to the Middle East experienced a drop in 2012-13, similar in magnitude to that of the global financial crisis of 2008-09. That is unsurprising given that Syria is a key transit for Turkish exporters trying to reach the rest of the Middle East.

In sum, Lebanese exporters appear to have been more effective in withstanding the fallout of the crisis than other neighbouring countries' exporters.

Figure 12: Syria's neighbours exports by destination (US\$ mln)

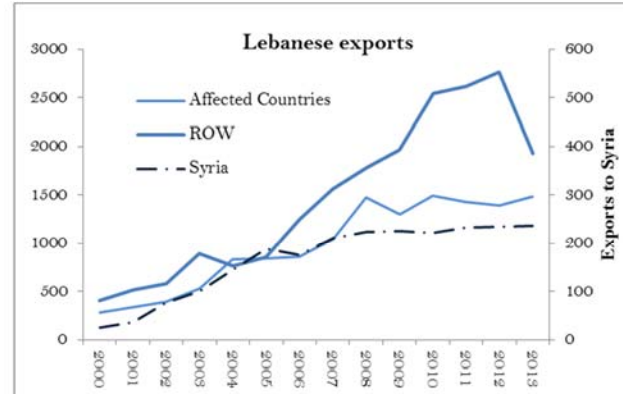
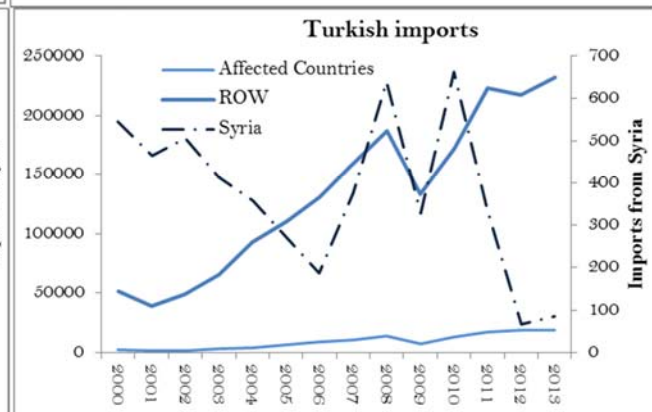
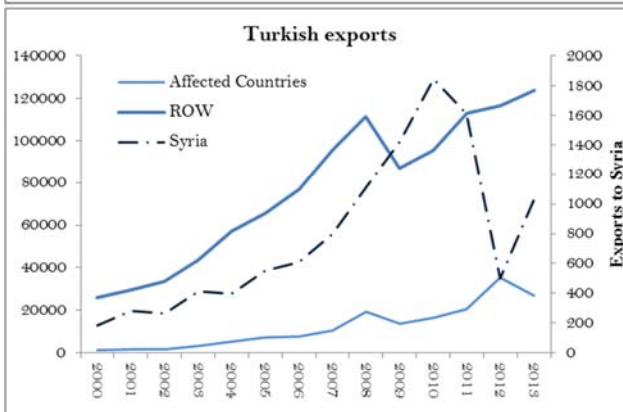
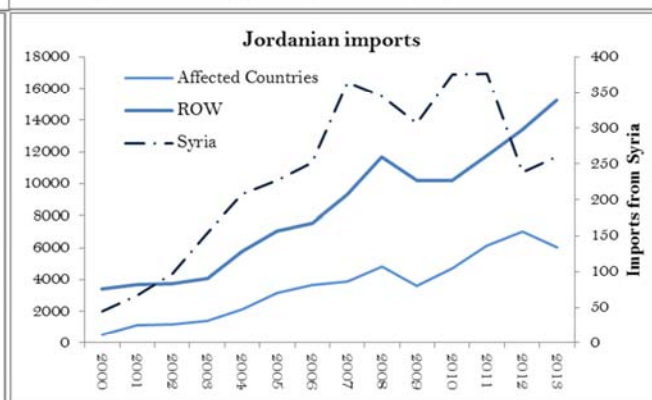
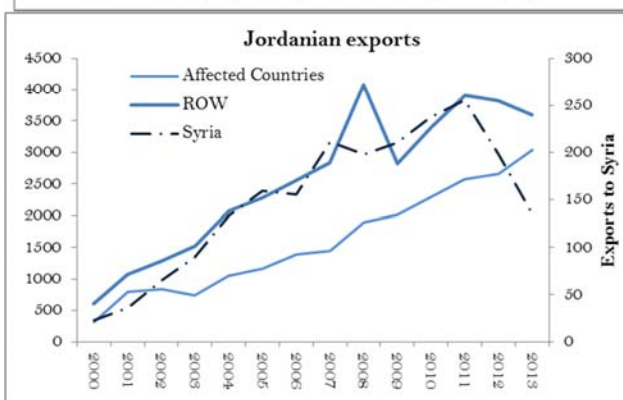
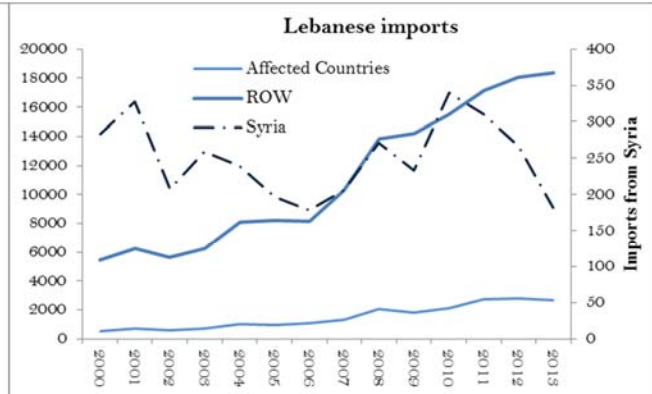


Figure 13: Syria's neighbours imports by destination (US\$ mln)



Source: Authors' elaboration on WITS

3.2. Food trade

The effects of the war on trade are expected to be stronger for goods that are typically traded with Syria and the rest of the region. Food products are a case in point. Two thirds of Lebanese exports of food and beverages before the war were destined to the affected group of countries (Figure 14). Nuts, ground nuts and other seeds, bananas, lemons and oranges, and potatoes are among the most heavily traded products. Lebanese exports of foodstuffs to both Syria and the group of affected countries have increased substantially between 2010 and 2013 (Figure 14). In particular, exports to the rest of the Middle East almost doubled during this period. In addition, Lebanon moved from a food trade deficit with Syria to a surplus, as foodstuff imports from Syria almost halved between 2010 and 2013, while

Lebanese exports slightly increased (see Figure 14 and Figure 15). This pattern is consistent with Lebanese foodstuff producers and traders replacing Syrian food production both in Syria and in other regional markets. Indeed the war has caused the destruction of much of the Syrian manufacturing base (including the food processing industry), notably in Aleppo and Homs, and of the reduction in agricultural output (World Bank, 2013a).

These changes have spurred an overall increase in Lebanese foodstuff exports (from US\$ 482 in 2010 to US\$ 695 million in 2013) as well as a re-direction of exports towards the Middle East and away from the rest of the world. The concomitant 20% increase in Lebanese food imports over the same period (Figure 15), especially from the rest of the world, suggests that Lebanese food production may also have been partly re-oriented away from the domestic market to satisfy the growing external demand. However the increase in food imports may also be due to the increasing number of refugees.

Figure 14: Lebanon's food exports by destination

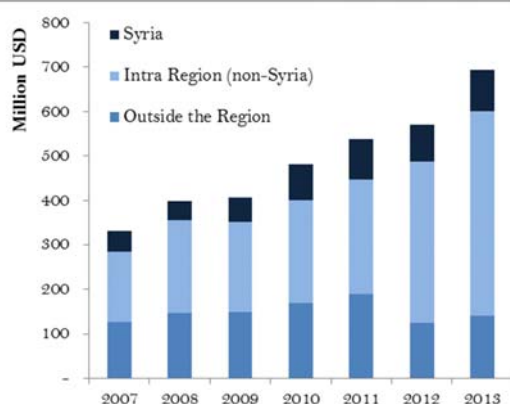
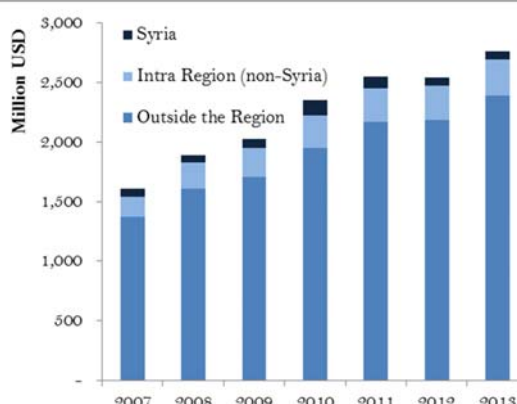


Figure 15: Lebanon's food imports by origin



Source: Authors' calculations based on WITS

Figure 16 and Figure 17 show two illustrative cases – wheat flour and sunflower oil respectively - of this changing food trade pattern. Lebanese exports of both items to Syria have soared since 2011, with exports of wheat flour increasing 14-fold between 2011 and 2013 (with a 10-fold increase in quantities) and exports of sunflower oil growing 2.5 times in 2011-12.⁹ Meanwhile imports from Syria of sunflower oil dropped from US\$ 5.5 million in 2010 to only US\$ 78,000 in 2013, confirming once again the destruction of much of Syrian productive capacity.

On the import side, the disruptions in the trade route via Syria are likely to have affected some manufacturing firms in Lebanon. In particular, around one fourth of total imports of industrial supplies are sourced from Syria and the Middle East and Turkey and include semi-finished base metal clads, aluminium alloys, and polyethylene, among others. Their share of imports has declined markedly after 2011, suggesting that the increased trade costs has made this input unviable for Lebanese producers. We leave it to further analyses to establish the extent to which this increased cost of industrial inputs may have affected the competitiveness of Lebanese producers.

⁹ The increase in exports of wheat flour also brought about an increase in imports of wheat. In addition data from the World Food Program shows that food vouchers distributed to Syrian Refugees in Lebanon were also geared towards wheat and flour products.

Figure 16: Lebanon's exports of wheat flour to Syria

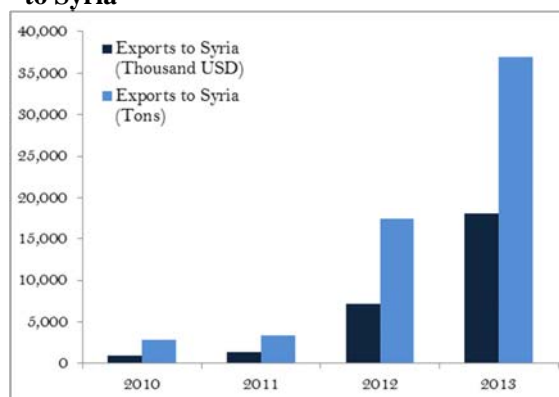
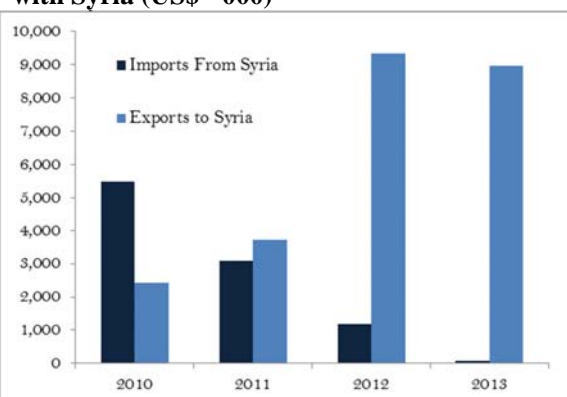


Figure 17: Lebanon's trade of sunflower oil with Syria (US\$ '000)



Source: Authors' calculations based on WITS

3.3. Services trade

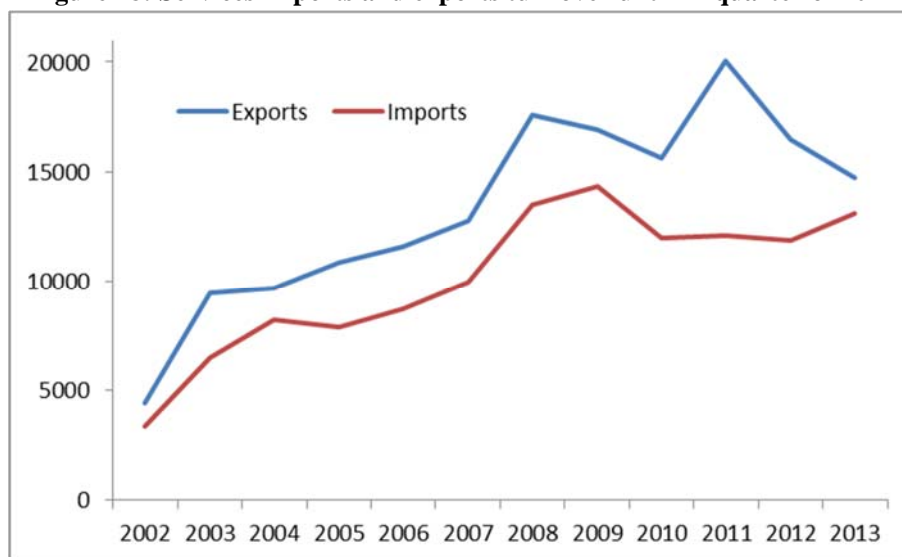
Lebanon's export sector is dominated by services, which account for around 80% of total exports. Indeed Lebanon is a net service exporter and the net balance has been compensating for part of the merchandise trade deficit. In addition, services, including tradable services such as tourism and transport, represent a large source of employment in the economy, particularly concentrated among the lower skilled. This makes services a key sector for the reduction of poverty and increase of living standards of the bottom share of the income distribution.

In principle, we would expect two separate effects of the Syrian war on services trade. The first is an increased demand for services due to the refugees' inflows. To the extent that the refugees are considered foreign residents in the Balance of Payment (BoP) statistics, that would spur an increase in services exports.¹⁰ The other effect is a reduction in the demand of services due to the disruption caused by the war. In particular, tourism could be affected as the costs of reaching Lebanon overland are higher and as the nearby civil war can deter potential tourists from travelling to the region. Services like land transport may also be affected as the volume of merchandise trade via land has dropped.

Figure 18 shows the annual services imports and exports using data collected by the main source of data for services trade, the Central Bank (Banque du Liban – BdL). The data shows a long-term growing trend for both exports and imports since 2002, with the former being systematically above the latter. This surplus in services trade, which has ranged between US\$ 1 and US\$ 8 billion, partly offsets the large merchandise trade deficit. While both flows follow a similar pattern through most of the period, they start to diverge after 2010, with a marked departure after 2011, when imports began growing modestly and exports decline substantially. According to BdL, data services exports dropped by 27% between 2011 and 2013, marking an unprecedented drop in recent times. This drop coincides with the timing of the Syrian war, although from the discussion above it is difficult to understand why the war may have affected so negatively services exports but not imports.

¹⁰ This modality of services export is called in WTO jargon 'mode 2', or via consumption of services abroad.

Figure 18: Services imports and exports turnover until 1st quarter of 2014



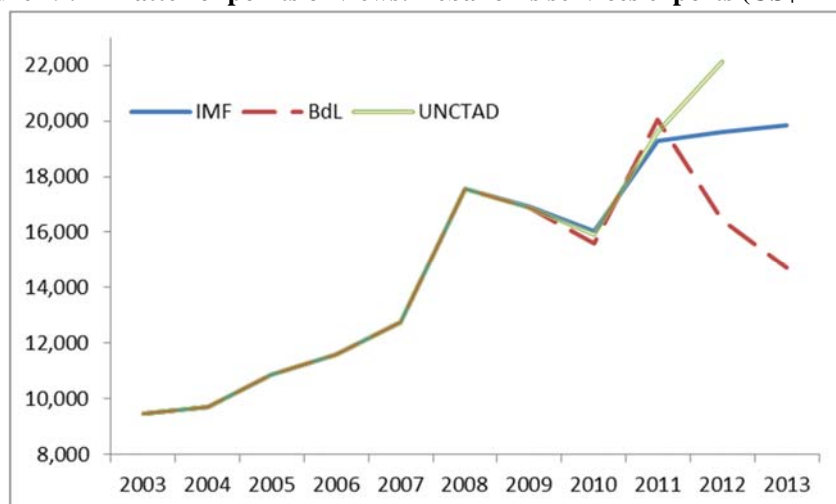
Source: Banque du Liban online BoP data

Unfortunately, as it is often the case with services trade, the quality of the data is not on par with that of merchandise trade, as the trade is not associated with the physical movement of a good across the border. This makes it hard to understand the actual effect of the war on this trade. The BdL produces statistics for the Balance of Payment on the basis of data collected from the banking system, which records the payments of foreign residents into the Lebanese system and classifies them according to an international classification system.¹¹ Other organizations, such as the IMF and UNCTAD, also report services trade data for Lebanon on the basis of the BdL statistics. Despite the common basis the data can differ substantially across sources, as Figure 19 documents for services exports. The three sources produce virtually identical data until 2011, showing rapidly growing exports since 2003, except for the blip during the global financial crisis in 2008-10. However, after 2011 the patterns diverge. According to BdL, data exports of services declined dramatically both in 2012 and 2013. The opposite is true according to UNCTAD data (though the data is available only until 2012), while the IMF records a flat trend.¹²

¹¹ The classification system used so far by the BdL is the Balance of Payment Manual 5 (BDM5), but the institution is currently transitioning towards the BDM6.

¹² The source of the difference is not entirely clear. One issue is that the data undergoes periodic adjustments to reflect corrections made once the raw data from the banking system are examined and these adjustments can be relatively large. For example, services exports in 2012 were initially estimated by the BdL at \$ 22 billion, a figure which is currently reported by UNCTAD. However, the data was subsequently revised downwards by BdL to \$20 billion and only recently, with the release of the last semester of BoP data, revised further downwards to the current \$ 16 billion.

Figure 19: A matter of points of views: Lebanon's services exports (US\$ million)



Source: Banque du Liban online BoP data, UNCTAD online statistics and IMF (2014)

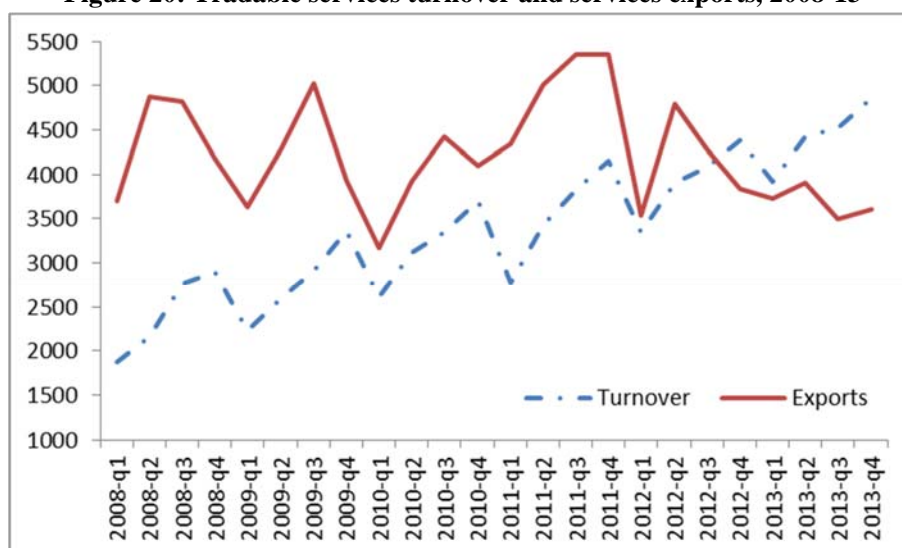
The difference between the data makes it particularly challenging to identify the effects of the Syrian war on services exports. It is difficult to gauge which of the figures is more likely to be accurate. A crude way to do so is to compare the export data with the data on services turnover from the Ministry of Finance. These data are compiled for the purpose of collecting the value added tax from domestic businesses, therefore the incentives to collect accurate data on the side of the government are strong as that is necessary for fiscal revenues. We focus in particular on those services sectors which are more typically tradable in order to mimic more closely the dynamic of services trade.¹³ The comparison between the quarterly MoF data on services turnover and quarterly BdL services exports from the BoP for the period 2008-13 is presented in Figure 20. The turnover is lower than the exports through most of the period as that does not include all services sectors. However, the quarter-to-quarter changes are remarkably close between the two series until the last quarter of 2011, after which the relationship between the two series disappears. The services turnover keeps growing unabatedly (including in the first quarter of 2014) and in the 3rd quarter of 2013 it becomes larger than the services exports, which instead decline rapidly.¹⁴ This may be suggestive evidence that BdL data for 2012 and 2013 may be underestimated and that the IMF or UNCTAD data may be closer to the real services export value.¹⁵ To be sure, this change in the relationship between the two series may also be genuine although it is unclear what factors may have determined it at the end of 2011.

¹³ These sectors include: printing, publishing & reproduction of recorded media; construction; hotels and restaurants; land transport and transport via pipelines; water transport; air transport; supporting and auxiliary transport activities and activities of travel agencies; post and telecommunications; financial intermediation, except insurance and pension funding; insurance and pension funding, except compulsory social security; activities auxiliary to financial intermediation; real estate activities; computer related services and business services.

¹⁴ The coefficient of services turnover is positive and significant at the 3% level in the regression of services export on turnover between the 1st quarter of 2008 and the 4th quarter of 2011. After that the coefficient becomes negative but not significant.

¹⁵ In the refugees analysis below we are bound to use the BdL data as that is the only available source with monthly services exports. As explained below, we account for the change in level of services exports after 2011 with a step dummy in the regression.

Figure 20: Tradable services turnover and services exports, 2008-13



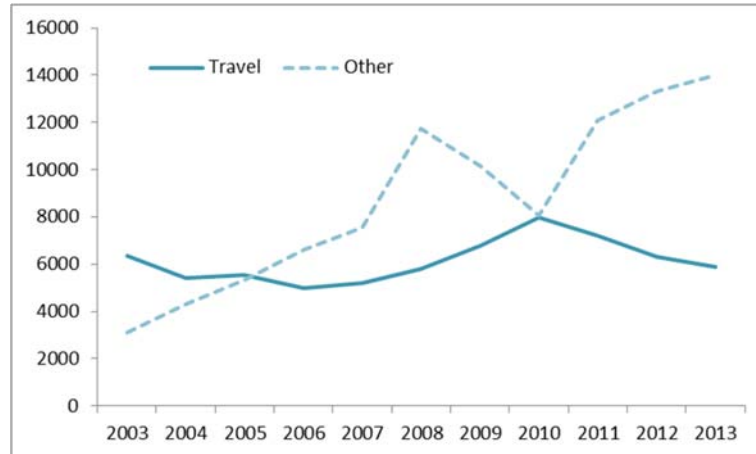
Note: Turnover figures include the following services sectors: printing, publishing & reproduction of recorded media; construction; hotels and restaurants; land transport and transport via pipelines; water transport; air transport; supporting and auxiliary transport activities and activities of travel agencies; post and telecommunications; financial intermediation, except insurance and pension funding; insurance and pension funding, except compulsory social security; activities auxiliary to financial intermediation; real estate activities; computer related services and business services.

Source: BdL and Lebanese Ministry of Finance

One services export where the different data sources seem to agree on is tourism. Both the BdL data on travel exports (The decline of the tourism sector is also confirmed by the data on loans to small and medium enterprises provided by Kafalat, the largest such credit scheme in Lebanon. The data shows that tourism suffered from the largest drop in credit between the first semester of 2011 and that of 2014 among the five main sectors targeted by Kafalat (the others being agriculture, industry, advanced technology and craft industry).

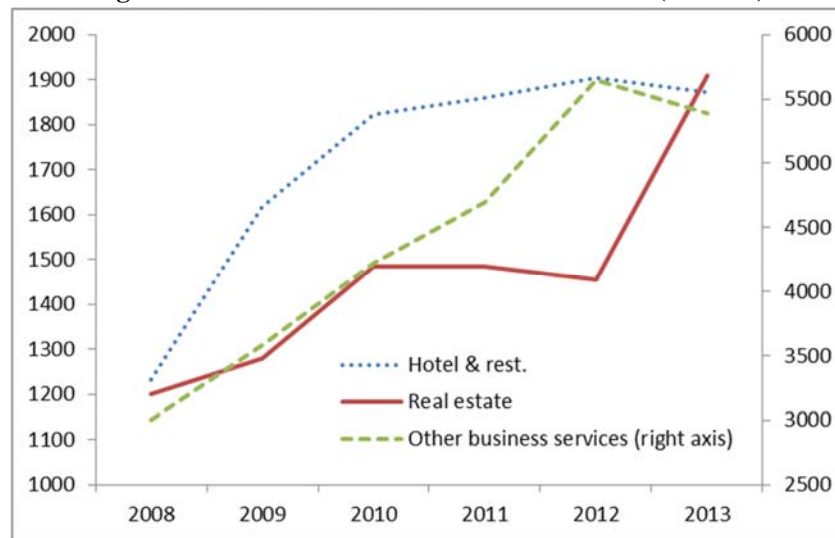
Figure 21) and the turnover data on hotels and restaurants - the closest proxy to tourism in the domestic classification (Figure 22) – show a slowing growth trend after 2010 and eventually a drop after 2012. Travel exports declined by 19% between 2011 and 2013, while turnover on hotels and restaurants dropped by 2% between 2012 and 2013 and by 5% between the first quarters of 2013 and of 2014. The decline of the tourism sector is also confirmed by the data on loans to small and medium enterprises provided by Kafalat, the largest such credit scheme in Lebanon. The data shows that tourism suffered from the largest drop in credit between the first semester of 2011 and that of 2014 among the five main sectors targeted by Kafalat (the others being agriculture, industry, advanced technology and craft industry).

Figure 21: Travel and other export services (in mln US\$)



Source: BdL (for travel service exports) and IMF (for total services exports)

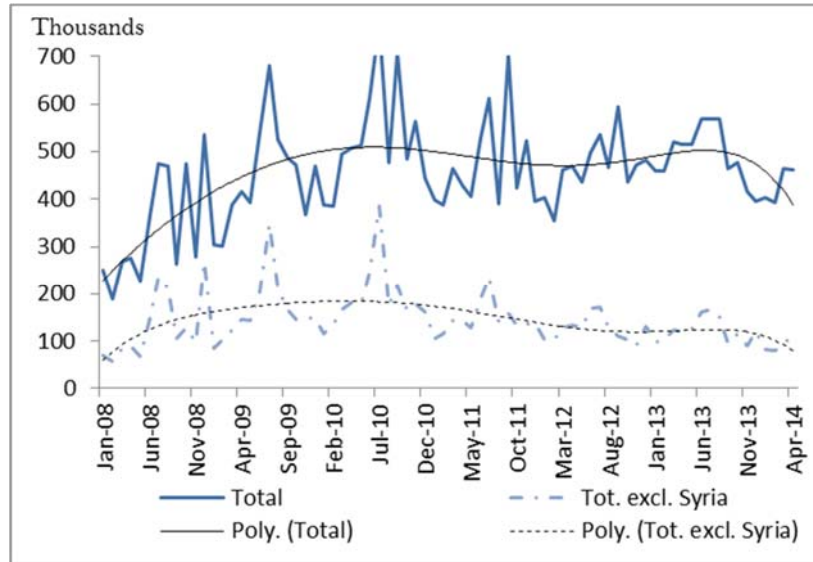
Figure 22: Turnover of selected services sectors (bn LBP)



Source: Ministry of Finance VAT data

Visitors from all parts of the world have steadily declined since 2010. Excluding Syrian and Lebanese nationals, the number of visitors into Lebanon declined by 23% between 2010 and 2011 and by a further 15% in 2012 and 2% in 2013 (Figure 23). The first four months of 2014 witnessed an additional decline of 16% vis-à-vis the same period in 2014. To a large extent, this reflects bans, formal or informal, that several countries have placed on travel to Lebanon due to security incidents and political disagreements, arguably mostly the result of infighting in Syria spilling over to Lebanon. Tourists are no longer crossing by land through Syria (the only land access to Lebanon aside from Israel), and Arab countries (excluding Syria) represented 53% of tourists in 2010. Visitors from other regions of the world have also declined, most notably Asia and Europe, as the Syrian crisis has increased the general public perception of danger in the Middle East in non-Arab countries.

Figure 23: Visitors to Lebanon



Note: visitors exclude Lebanese nationals. Source: Lebanese Ministry of Tourism

The crisis of tourism is problematic as tourism is one of Lebanon's leading services export sectors with inflows representing a major source of revenue. According to Lebanon's balance of payments, tourism spending as a share of GDP totalled 5.7% in 2010, and World Bank staff estimate the figure to have fallen to 5.0% in 2011 and 4.5% in 2012. The World Tourism Organization estimates total tourism receipts in 2010 closer to 22% of GDP (39% of total exports). This figure dropped to 18% of GDP in 2011 (28% of total exports), amounting to a decline of US\$ 1.1 billion.

While tourism receipts have suffered the fallout of the Syrian war, other services sectors have mostly proven resilient to the war. Contrary to most economies in the region, Lebanon's services exports do not rely exclusively on exports of transport and tourism, but rather expand to cover modern sectors like financial, real estate and business services.

Figure 21 shows that non-tourism services exports have grown unabatedly during the Syrian war after the 2008-10 blip due to the global financial crisis.¹⁶ This growth is confirmed also by considering the turnover figures of some of the main modern tradable services, including real estate and business services (Figure 22).¹⁷ In particular, real estate services re-bounced in 2012-13 after a slowdown in 2012. Part of this resilience has been helped by real estate investments by Syrian nationals. According to BdL data, these grew from US\$ 440 to US\$ 673 million between 2011 and 2012 and in 2014 Syrians replaced the Saudis as the largest foreign real estate investor in Lebanon, responsible for a quarter of total foreign investments in the sector. This growth in Syrian investments is likely to have been spurred by the crisis, which has forced millions of Syrians to relocate to neighbouring countries, including Lebanon. Some of them used their savings to buy properties in Lebanon thus spurring the Syrian investment surge.

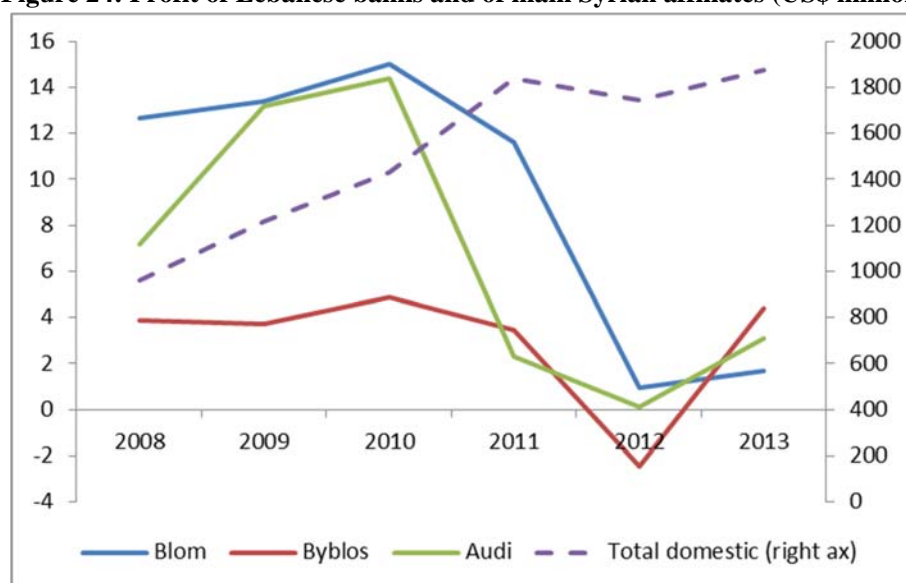
¹⁶ We compute non tourism export services by subtracting travel service exports (from the BdL) from the total value of services exports (from the IMF).

¹⁷ Other large sectors including transport and construction display a similar pattern (not shown here but available upon request).

Other business services encompass legal, accounting, engineering, architecture, advertising and media services, whose turnover in 2013 was around US\$ 3.6 billion, i.e. larger than the entire merchandise exports. These sectors have continued to be resilient despite the challenging economic environment relying on well-developed skills and budding services infrastructure. Some business services firms may have even replaced Syrian firms in providing services especially in the regional markets.

The Syrian war has also hurt somewhat Lebanese banks through their Syrian affiliates. In September 2012, subsidiaries and associates of Lebanese banks accounted for 6 out of the 20 banks in Syria with a total number of branches equal to 114. The Syrian affiliates of major Lebanese banks were affected by the crisis and experienced a drastic drop in profits in 2011 and 2012, with Byblos Bank even registering a small loss in 2012 (Figure 24). The reduction in profits was mainly due to the steep increase in non-performing loans. However, the losses were marginal relative to the overall income of the Lebanese banks, which in fact was little affected with only a 5% reduction in profits in 2011-12, followed by a 7% increase in 2013. Even the profits of Syrian affiliates rebounded in 2013 although not yet to the pre-crisis level.

Figure 24: Profit of Lebanese banks and of main Syrian affiliates (US\$ million)



Source: Liban Bilan Banques

Overall, the descriptive data suggests that the Syrian war has caused some disruption in overland trade, causing a re-orientation of some of that trade via sea and a reduction of imports from the Middle East. That is the consequence of Syria being the only viable land connection to the rest of the world for Lebanon (as the border between Lebanon and Israel is sealed). Lebanon's merchandise exporters to Syria and to the region seem to have suffered the fallout of the war less than the other Syrian neighbours, Jordan and Turkey. Some have even managed to replace Syrian production affected by the war in the region, particularly in the food sector. The data do not allow a complete picture of the performance of services exports, which represent the bulk of Lebanese exports, since the beginning of the war. Tourism has been negatively impacted by the crisis-related political and security spillovers. However there are signs of relative resilience by other services exports, including real estate, business services, transport and financial services, which have maintained a positive rate of growth throughout the crisis so far. In the next sections we'll complement this descriptive data with analyses of the impact of the Syrian war on Lebanese trade using a variety of data.

4. Gravity analysis

We employ a gravity analysis in order to obtain more rigorous aggregate evidence on the effects of the crisis on merchandise exports and imports. In a nutshell, the gravity model measures the difference in imports (exports) of Lebanon between the war and the pre-war period vis-à-vis that of all other countries.

4.1. Methodology and data

The gravity model is the workhorse of empirical analysis in international trade. It dates back to the seminal paper of Tinbergen (1962) and, after falling into disrepute in the 1970s and 1980s, it has re-emerged since the mid-1990s with the work of McCollum (1995) and Leamer and Lavinsohn (1995). The work of Eaton and Kortum (2002) and Anderson and Van Wincoop (2003) provided microfoundation to the gravity model, granting it full legitimacy within the economic discipline. The success of the gravity model relies on its ability to fit the data very well. Bilateral trade flows can be greatly explained by the mass of the two countries involved, proxied by GDP, and distance as well as other trade barriers. Gravity models have been used to assess the impact on trade of free trade agreements, currency unions, colonial linkages and many other variables that can affect trade flows.

In this report we use the gravity model to analyze the impact that the Syrian civil war had on neighbouring countries' trade. The gravity framework allows us to have a preliminary overview of this effect before moving into the firm level study. The starting point of our gravity analysis is:

$$X_{ijt} = \beta_0 (Y_{it})^{\beta_1} (Y_{jt})^{\beta_2} \left(\frac{T_{ijt}}{P_{it}P_{jt}} \right)^{1-\sigma} \quad (1)$$

where X_{ijt} represents exports from country i to j at time t ; Y_{it} and Y_{jt} are gross domestic product in country i and j ; T_{ijt} denotes any type of trade barriers between countries i and j ; P_{it} and P_{jt} are the overall domestic price indices, and capture how the bilateral trade between countries i and j is affected by trade resistance of i and j with all the countries in the world.

Equation (1) is a structural gravity model with multilateral resistance terms, as derived by Anderson and Van Wincoop (2003) and Eaton and Kortum (2002). The empirical estimation of (1) takes the usual following form:

$$\ln X_{ijt} = \beta_0 + \beta_1 \ln Y_{it} + \beta_2 \ln Y_{jt} + \beta_3 \text{Treatment}_{ijt} + \beta_4 \ln D_{ij} + \beta_5 \text{RTA}_{ijt} + S_i + S_j + \lambda_t + \varepsilon_{ijt} \quad (2)$$

where D_{ij} denotes distance between i and j ; RTA_{ijt} refers to regional trade agreements between the two countries; S_i and S_j are country fixed effects that capture the multilateral resistance term (Anderson and Van Wincoop, 2003; and Feenstra, 2004); λ_t is a time dummy; and ε_{ijt} is a random error term.

The variable Treatment_{ijt} captures the effect of the Syrian conflict on neighbouring countries. In particular, we consider three types of treatment:

Treatment A = 1 if i is a neighbor of Syria and year=2011 or 2012; 0 otherwise

Treatment B = 1 if i is a neighbor of Syria, j is Syria, and year=2011 or 2012; 0 otherwise

Treatment C = 1 if i is a neighbor of Syria, j is reached through Syria, and year=2011 or 2012; 0 otherwise

We also experiment a specification with 2012 as the only war year obtaining very similar results.¹⁸

Treatment A captures the overall exports difference before and after the Syrian war for neighbouring countries; Treatment B identifies the impact of the war on exports towards Syria; Treatment C measures the effect of the war on neighbouring countries' exports towards countries that traditionally are reached passing through Syria.

As shown in the Appendix, these dummy variables capture the average treatment effect of the Syrian war on a country pair. A consistent estimation of parameters depends on the correlation of treatment with differences in unobservables for partners to which the treatment applies versus partners to which it does not. This correlation depends on: (i) endogeneity problems and omitted variable bias, and (ii) selection bias.

We believe that the Syrian conflict is a truly exogenous shock. and there cannot be a selection bias in being a neighbor of Syria when it is undergoing a conflict. As for possible endogeneity bias, the question is whether there is some third variable that simultaneously influences the war in Syria and the volume of trade. In order to minimise this risk, we control for time invariant bilateral variables through the following specification:

$$\ln X_{ijt} = \beta_0 + \beta_1 \ln Y_{it} + \beta_2 \ln Y_{jt} + \beta_3 \ln D_{ij} + \beta_4 RTA_{ijt} + \beta_5 Treatment_{ijt} + S_{ij} + S_i + S_j + \lambda_t + \varepsilon_{ijt} \quad (3)$$

where S_{ij} , which captures time invariant bilateral variables, is added respect to (2). Following Baier and Bergstrand (2007), this is our preferred specification.

Finally, Santos Silva and Tenreyro (2006) show that the log-linearization of the gravity model in equation (1) undermines the consistency of the estimator under heteroskedastic errors. This is because the variance of the error term turns to depend on the regressors. In order to solve this problem, they propose to estimate the gravity equation through a Poisson pseudo-maximum-likelihood estimator. This estimator has also the advantage of keeping the values of trade that are zero, without dropping those observations as when taking logs. Therefore, we also run the following regression:

$$X_{ijt} = \beta_0 (Y_{it})^{\beta_1} (Y_{jt})^{\beta_2} D_{ij}^{\beta_3} e^{(Treatment_{ijt} + S_{ij} + \lambda_t)} \varepsilon_{ijt} \quad (4)$$

We run our analysis using aggregate trade flows from IMF DOTS. Trade flows are expressed in real terms using country GDP deflator, with the base year 2005 from the World Economic Outlook data. Data on GDP come from WEO. Distance and regional trade agreements come from CEPII database. We focus our analysis on the subsample of Middle East countries between 2004-2012 (data for 2013 are still too incomplete to be included in the analysis). This is because the trade flow between China and Malaysia, as an example, carries little information on the effect of the Syrian war on Lebanese trade flows.¹⁹

4.2. Empirical results

Table 1 provides evidence of the effects of Treatment A, which refers to the overall pattern of trade that Syria's neighbouring countries experienced after the war, irrespectively of the destination of exports or

¹⁸ Results are not shown here to save clutter, but available upon request.

¹⁹ We run our analysis also on the full sample including all countries, but for space parsimony we do not always include these estimates in the report. We will highlight some differences from the main results when they occur. Our sample includes Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria, Turkey, UAE, Yemen. We exclude Israel and Palestine because of representation issues. For our research question, this does not influence our results.

source of imports. Both specifications (2) and (3) show that neighbouring countries experienced a contraction of 22% in overall imports, and an increase of 42% in overall exports (columns 1-2). However, these results are not robust to the pseudo-Poisson estimation, although the coefficient of treatment A for exports remains negative.²⁰ Taken at their face value, these results suggest that Syrian neighbouring countries seem to have underperformed compared to other Middle Eastern countries in terms of exports.²¹

Table 1: Treatment A: Overall trade pattern of neighbouring countries

Dep. variable	imports	imports	imports	exports	exports	exports
Method	OLS	OLS	PPML	OLS	OLS	PPML
	(1)	(2)	(3)	(1)	(2)	(3)
Treatment A	0.22** [2.23]	0.22** [2.22]	0.1 [1.62]	-0.42*** [-4.06]	-0.42*** [-4.11]	-0.11 [-1.08]
GDP partner (ln)	-0.37 [-1.64]	-0.37* [-1.65]	0.00* [1.94]	0.36 [1.50]	0.36 [1.49]	0.00 [0.55]
GDP reporter (ln)	0.75*** [2.78]	0.74*** [2.77]	0.00*** [3.01]	1.59*** [14.03]	1.64*** [5.62]	0.00 [-0.32]
Distance (ln)	-2.35*** [-5.93]			-3.08*** [-8.34]		
RTA	-2.77*** [-7.02]			-2.00*** [-5.09]		
Observations	15,477	15,477	12,525	15,477	15,477	12,622
R-squared	0.75	0.02		0.70	0.03	
reporter fx	yes	yes	yes	yes	yes	no
partner fx	yes	yes	yes	yes	yes	no
pairwise fx	no	yes	no	no	yes	yes
vce cluster	pairwise	pairwise	pairwise	pairwise	pairwise	pairwise
year dummies	yes	yes	yes	yes	yes	yes

*Note: t-values in brackets. *, **, *** indicate significance at 10%, 5% and 1% level respectively. Specification (1) is with country fixed effects; specification (2) adds pairwise fixed effects; and specification (3) is a Pseudo-Poisson estimation.*

In order to investigate further to what extent the Syrian war has affected the Lebanese and other neighbouring countries' trade performance, we analyse the effect of Treatment B, which captures the loss in trade flows with the Syrian market by neighbouring countries after the beginning of the war. In Table 3, we run the same gravity model testing for treatment B but for individual countries. Both imports from and exports to Syria are negatively affected by the war in each of the neighbouring country, with Turkey experiencing the largest relative drop in imports, and Jordan the largest drop in exports. The reduction in trade applies also to Lebanese exports to Syria, which experience a 26% reduction relative to the other export flows (columns 1-2), while the drop in imports is not significant in the PPML specification (column 3). The reduction in trade for Lebanon is consistently lower than for the other neighbours – except Iraq – in line with the descriptive statistics presented in section 3. It provides further evidence of the greater ability to adapt of the Lebanese traders to the war environment in Syria.

²⁰ When we run these specifications on the full database, the results on Treatment A turn insignificant. Hence, there is a possibility that a sample selection bias might be driving the results.

²¹ The results for the other control variables indicate that distance has the expected negative and significant effect. The variable regional trade agreement drops out in the specification with country-pair fixed effects because they do not vary in our sample between 2004 and 2012. Surprisingly, the coefficient is negative and significant in the regression with country fixed effects. This might be due to the short span of time for a positive effect to emerge, given that the data do not have enough variation before and after the trade agreement. Finally, the partner GDP has a insignificant, or even negative coefficient. This is something related to the Middle East subsample; as we run the regression for the full sample, the coefficient turns positive and significant as expected.

Table 2 suggests a significant contraction in neighbouring countries' exports to (by 64%) and imports from (by 79%) Syria, vis-à-vis the flow towards the other partner countries, and vis-à-vis the changes in the other countries' trade with Syria. The result for exports is robust to the pseudo-Poisson estimation, even if the size of the coefficient decreases to 36%, while it is not robust for imports, although it remains negative (column 3).²² When we exclude bilateral fixed effects, the coefficient is very large in magnitude but marginally insignificant. This confirms the importance to control for time invariant bilateral characteristics in order to explain trade flow.

In Table 3, we run the same gravity model testing for treatment B but for individual countries. Both imports from and exports to Syria are negatively affected by the war in each of the neighbouring country, with Turkey experiencing the largest relative drop in imports, and Jordan the largest drop in exports. The reduction in trade applies also to Lebanese exports to Syria, which experience a 26% reduction relative to the other export flows (columns 1-2), while the drop in imports is not significant in the PPML specification (column 3). The reduction in trade for Lebanon is consistently lower than for the other neighbours – except Iraq – in line with the descriptive statistics presented in section 3. It provides further evidence of the greater ability to adapt of the Lebanese traders to the war environment in Syria.

Table 2: Treatment B: loss of the Syrian market

Dep. variable	imports	imports	imports	exports	exports	exports
Method	OLS	OLS	PPML	OLS	OLS	PPML
	(1)	(2)	(3)	(1)	(2)	(3)
Treatment B	-2.08	-0.79***	-0.09	-2.39	-0.64***	-0.36***
	[-1.13]	[-3.71]	[1.47]	[-1.38]	[-7.13]	[-3.50]
lgdppartner	-0.38*	-0.37*	0.00*	0.36	0.36	0.00
	[-1.67]	[-1.66]	[1.87]	[1.47]	[1.47]	[0.62]
lgdpreporter	0.72***	0.71***	0.00***	1.68***	1.69***	0.00
	[2.67]	[2.66]	[3.06]	[5.79]	[5.83]	[-0.09]
ldist	-2.36***			-3.10***		
	[-5.96]			[-8.38]		
rta	-2.78***			-2.01***		
	[-7.04]			[-5.11]		
Observations	15,477	15,477	12,525	15,477	15,477	12,622
R-squared	0.75	0.02		0.70	0.03	
reporter fx	yes	yes	yes	yes	yes	no
partner fx	yes	yes	yes	yes	yes	no
pairwise fx	no	yes	no	no	yes	yes
vce cluster	pairwise	pairwise	pairwise	pairwise	pairwise	pairwise
year dummies	yes	yes	yes	yes	yes	yes

*Note: t-values in brackets. *, **, *** indicate significance at 10%, 5% and 1% level respectively. Specification (1) is with country fixed effects; specification (2) adds pairwise fixed effects; and specification (3) is a Pseudo-Poisson estimation.*

Finally, Table 4 shows the effect of Treatment C, which refers to the impact on neighbouring countries' trade for flows to destinations usually shipped through Syria. We have investigated flows to closeby countries (i.e. from Lebanon to Jordan or Turkey), as well as flows to countries further away (i.e. from

²² These results hold also if we run the estimates on the full sample of countries, so they are not driven by an eventual sample selection bias. In the full sample case, the coefficient for exports is -42% and that for imports - 64%. Results available upon request.

Table 3: Treatment B: loss of the Syrian market, individual countries

	(1)	(2)	(3)	(1)	(2)	(3)
Method	OLS	OLS	PPML	OLS	OLS	PPML
Dep. Variable	imports	imports	Imports	exports	exports	exports
Leb	-5.82*** [-5.12]	-0.45*** [-7.23]	-0.06 [-1.58]	-5.99*** [-5.15]	-0.57*** [-8.86]	-0.26*** [-4.91]
Jor	-1.98* [-1.95]	-0.75*** [-12.68]	-0.38*** [-9.40]	-2.99*** [-2.86]	-0.81*** [-14.02]	-0.64*** [-11.33]
Tur	-6.52*** [-7.08]	-1.48*** [-17.51]	-1.00*** [-21.93]	-6.04*** [-6.26]	-0.46*** [-5.85]	-0.52*** [-7.64]
Irq	5.96*** [6.28]	-0.50*** [-6.18]	-0.04 [-1.20]	5.43*** [5.59]	-0.73*** [-8.25]	-0.20*** [-4.73]
GDP pairs	YES	YES	YES	YES	YES	YES
Observations	15,477	15,477	12,525	15,477	15,477	12,622
R-squared	0.75	0.02		0.70	0.03	
reporter fx	yes	yes	yes	yes	yes	yes
partner fx	yes	yes	yes	yes	yes	yes
pairwise fx	no	yes	yes	no	yes	yes
vce cluster	pairwise	pairwise	pairwise	pairwise	pairwise	pairwise
year eff.	yes	yes	yes	yes	yes	yes

Note: t-values in brackets. *, **, *** indicate significance at 10%, 5% and 1% level respectively. Specification (1) is with country fixed effects; specification (2) adds pairwise fixed effects; and specification (3) is a Pseudo-Poisson estimation.

Table 4: Treatment C: neighbours trade to countries passing through Syria

Dep. variable	imports	imports	imports	exports	exports	exports
Method	OLS	OLS	PPML	OLS	OLS	PPML
	(1)	(2)	(3)	(1)	(2)	(3)
Treatment C	-2.78*** [-2.82]	0.00 [0.03]	0.27*** [2.36]	-2.64*** [-2.14]	-0.23 [-1.37]	0.00 [0.62]
lgdppartner	-0.36 [-1.58]	-0.37* [-1.65]	0.00* [1.87]	0.37 [1.52]	0.36 [1.47]	0.00 [0.63]
lgdpreporter	0.71*** [2.64]	0.71*** [2.66]	0.00*** [3.08]	1.68*** [5.76]	1.69*** [5.83]	-0.00 [-0.08]
ldist	-2.38*** [-6.01]			-3.11*** [-8.43]		
rta	-2.79*** [-7.06]			-2.02*** [-5.14]		
Observations	15,477	15,477	12,525	15,477	15,477	12,622
R-squared	0.75	0.02		0.70	0.03	
reporter fx	yes	yes	yes	yes	yes	yes
partner fx	yes	yes	yes	yes	yes	yes
pairwise fx	no	yes	yes	no	yes	yes
vce cluster	pairwise	pairwise	pairwise	pairwise	pairwise	pairwise
year dummies	yes	yes	yes	yes	yes	yes

Note: t-values in brackets. *, **, *** indicate significance at 10%, 5% and 1% level respectively. Specification (1) is with country fixed effects; specification (2) adds pairwise fixed effects; and specification (3) is a Pseudo-Poisson estimation.

The results from the gravity exercise show an overall negative but not particularly robust effect of the Syrian war on neighbouring countries' trade flows. This comes mainly from the loss of the Syrian market. This effect is smaller in magnitude and less robust for Lebanon than it is for Turkey and Jordan. The empirical analysis using micro level exporter data in the next section allows us to investigate this evidence further.

5. Firm level analysis

5.1. Data and methodology

We use firm level custom data for Lebanon and Jordan from the exporter dynamics database (Cebeci et al., 2012) in order to examine the evidence of the impact of the war on exporters. The data covers the period 2008-2012 for Lebanon, and 2003-2012 for Jordan. For comparability purposes, we restrict the analysis to the 2008-12 period focusing in particular on the change between 2010 and 2012.

The data includes the universe of all custom-level transactions of exports comprising the firm identifier, the value in US\$, the destination and the HS 6 digit sector.²³ Table 5 presents the summary statistics for Lebanon, which show that there are over 5,000 individual exporters every year in Lebanon, exporting products in over 3,000 6-digit HS sectors. Around 600 of these exporters export to Syria, a number which has slightly increased in 2011 and 2012 (relative to 2010). However exports to Syria cover a smaller range of products since the beginning of the war.

Table 5: Lebanese exporters, 2008-12

	2008	2009	2010	2011	2012
<i>All exporters</i>					
Nr. exporters	5,608	5,272	5,193	5,220	5,308
Nr. of products	3,124	3,047	3,041	3,105	3,024
Nr. of prod. per firm	7.53	7.83	8.21	8.59	8.93
Nr. destinations per firm	2.94	2.98	2.99	3.02	3.04
Tot. Export per firm (US\$)	620,031	660,919	818,952	817,137	844,599
Exp. per firm-dest-year (US\$)	210,991	221,708	273,916	270,137	278,093
Exp. per firm-dest-prod-year (US\$)	52,016	53,528	61,919	57,184	56,913
<i>Syrian exporters</i>					
Nr. exporters	585	629	592	605	617
Nr. products (to Syria)	823	745	707	660	684
Nr. prod. per firm (to Syria)	17.72	15.30	14.86	16.56	15.56
Nr. destinations per firm	7.44	7.07	7.07	7.31	7.27
Syrian exp. per firm (US\$)	382,192	358,416	372,846	355,104	476,945
Tot. Export per firm (US\$)	2,542,748	1,833,536	2,267,926	2,246,749	2,307,143
Syrian export per product-firm (US\$)	118,486	139,940	149,746	143,512	180,426
Exp. per firm-dest-prod-year (US\$)	73,219	62,344	75,935	68,849	70,342

Source: Authors' elaboration on Cebeci et al. (2012)

There are around 2,500 exporters in Jordan, exporting an average of 1,500 products per year (Table 6) confirming that the Lebanese export sector is more diversified than the Jordanian one. Before the war, between 350 and 380 exporters served Syria as well, a number which has increased to almost 800 by

²³ Only in the case of Jordan, also the quantity transacted is available.

war, between 350 and 380 exporters served Syria as well, a number which has increased to almost 800 by 2012. By contrast, the average value of exports to Syria declined by over 70% between 2010 and 2012, a pattern that contrasts with that of Lebanese exporters, which increased the average exports to Syria from US\$ 372 to US\$ 477 thousand during the same period.

A common pattern to both Lebanese and Jordanian exporters is that firms exporting to Syria export on average more products, to more destinations and with a higher average value than the rest of the exporters.

In order to test more formally for the impact of the Syrian crisis, we sum the value of exports by product so as to obtain firm-destination-year combination as the unit of analysis. We then construct a balanced panel by adding zero values for every firm-destination combination that has a positive export values for some of the years but not for all. We then compute the difference between the exports pre-war in 2010, and the export during the war in 2012. We use this variable as the main dependent variable to test for the effects of the war on the exports to Syria (the equivalent of treatment B above) as well as the exports through Syria (the equivalent of treatment C above).

Table 6: Jordanian exporters, 2008-12

	2008	2009	2010	2011	2012
<i>All exporters</i>					
Nr. exporters	2,158	2,326	2,464	2,805	2,505
Nr. of products	1,418	1,426	1,411	1,631	1,363
Nr. of prod. per firm	2.93	2.92	2.85	4.85	5.43
Nr. destinations per firm	3.26	3.07	3.09	3.84	4.36
Tot. Export per firm (US\$)	2,214,511	2,016,737	2,082,435	1,843,495	2,530,166
Exp. per firm-dest-year (US\$)	678,630	656,166	674,970	479,729	580,888
Exp. per firm-dest-prod-year (US\$)	419,497	399,636	417,029	261,757	316,887
<i>Syrian exporters</i>					
Nr. exporters	352	374	381	640	777
Nr. of products (to Syria)	284	292	274	262	208
Nr. of prod. per firm (to Syria)	5.69	5.68	5.40	12.13	12.16
Nr. destinations per firm	6.89	6.82	7.03	8.61	8.83
Syrian exp. per firm (US\$)	340,334	429,443	450,780	187,617	119,824
Tot. Export per firm (US\$)	4,228,761	5,528,064	6,042,214	6,483,840	7,493,973
Syrian exp. per product-firm (US\$)	213,543	280,300	319,827	86,261	55,156
Exp. per firm-dest-prod-year (US\$)	341,483	447,704	492,530	342,099	400,249

Source: Authors' elaboration on Cebeci et al. (2012)

First we identify the effects of the war on exports to the Syrian market for firms that exported to Syria before the war:

$$\Delta Exp_{id} = \beta_0 + \beta_1 Syria_{id} + \varepsilon_{id} \quad (5)$$

for each firm i and destination d , where $Syria$ is a dummy that takes the value 1 if i was an exporter to Syria in 2010 and if $d=Syria$. This specification measures to what extent exports to Syria, which were positive in 2010, experienced a different change in 2010-12 vis-à-vis the other export flows of other exporters and of the same exporter to other destinations.

$$\Delta Exp_{id} = \beta_0 + \beta_1 Syria_{id} + \alpha_i + \varepsilon_{id} \quad (6)$$

The effect of the civil war on exporters to Syria is likely to be heterogeneous according to the relative importance of the Syrian market for the firm. We distinguish between firms for which the share of exports to Syria relative to all other destinations is above or below the median share in 2010. The specification we run is:

$$\Delta Exp_{id} = \beta_0 + \beta_1 AboveMed_{id} + \beta_1 BelowMed_{id} + \varepsilon_{id} \quad (7)$$

As discussed above, the war may have also provided an opportunity to some exporters to replace Syrian production in Syria. In order to test for this effect, we add a dummy $Syria_d$, which takes the value of 1 for all exports to Syria:

$$\Delta Exp_{id} = \beta_0 + \beta_1 Syria_{id} + \gamma Syria_d + \varepsilon_{id} \quad (8)$$

The coefficient γ measures the change in export to Syria regardless of whether the exports were zero or not in 2010. Controlling for the variation in exports to Syria which were positive in 2010 (captured by the β_1 coefficient), γ captures the replacement effect in the Syrian market.

Finally, we test for the effect of the war on the exports to the destinations which can best be reached via Syria. To do that, we construct a variable $SyrTransit$ similar to $Syria$, which takes the value of 1 for the exports towards one of these destinations, which were positive in 2010.²⁴

$$\Delta Exp_{id} = \beta_0 + \beta_1 Syria_{id} + \beta_2 SyrTransit_{id} + \varepsilon_{id} \quad (9)$$

5.2. Empirical results

Table 7 presents the results of the main specifications. Column (1) reports the result of specification (5). On average, a firm that was exporting to Syria in 2010 experienced by 2012 a drop of US\$ 90,000 in its exports to Syria relative to the other exports of the same firm, as well as to the other exports of firms that were not exporting to Syria in 2010. That is roughly a quarter of the average firm-level export to Syria in 2010. The effect is smaller and less significant when compared only to the other exports of the same firm, a result obtained by implementing specification (6) (column 2). This is *prima facie* evidence that Syrian exporters have not been able to re-orient their exports to other destinations. In column 3, we show that all of the negative effect of the war on Syrian exporters is explained by the relatively large export flows.

The impact of the war is much larger on Jordanian exporters to Syria. On average, the drop relative to the other flows is US\$ 340,000, equivalent to three quarter of the average export to Syria in 2010 among exporters to Syria (column 4). The effect is even larger relative to the other flow of the same exporter, a result that suggests some re-orienting of the exporter towards other destinations (column 5). Again, the effect is almost entirely explained by the relatively large export flows (column 6). All these results are robust to using the change between the average 2008-10 and the 2010-12 export (Table A2).

In columns (7)-(8) we test for the replacement effect of the war by running specification (8). The results suggest that many firms which were not exporting to Syria in 2010 did start to export by 2012. On average, exports to Syria increased by US\$ 125,000 per firm relative to the other flows of the same firm

²⁴ For Lebanon, the relevant destinations are Turkey, Iraq, Jordan, Saudi Arabia, Kuwait, Arab Emirates, Qatar, Yemen, Oman and Iran. For Jordan, those are Lebanon and Turkey.

The result is similar also when measuring the effect relative to the other exports of the same firm (column 8). The replacement effect seems to be large enough to compensate the negative impact of the war on the pre-crisis exporters to Syria. Indeed, for the average exporter, the change in exports to Syria in the period 2010-12 has been positive overall although not significant (column 9). The replacement effect has been much smaller for Jordanian exporters, which have been less able to replace Syrian production in Syria than their Lebanese counterparts (columns 10-12).

Table 7: Difference in difference: export to Syria, 2010-12

Country Dep. Var.	(1) LBN ΔExport	(2) LBN ΔExport	(3) LBN ΔExport	(4) JOR ΔExport	(5) JOR ΔExport	(6) JOR ΔExport
Exp. to Syria (2010)	-89,599*** (-2.636)	-55,846 (-1.128)		-339,669*** (-3.173)	-454,608* (-1.648)	
Above median initial exp to Syria			-179,190*** (-2.856)			-659,399*** (-3.371)
Below median initial exp to Syria			-8 (-0.001)			-18,256 (-0.336)
Firm FE	NO	YES	NO	NO	YES	NO
Observations	43,298	43,298	43,298	23,334	23,334	23,334
Country Dep. Var.	(7) LBN ΔExport	(8) LBN ΔExport	(9) LBN ΔExport	(10) JOR ΔExport	(11) JOR ΔExport	(12) JOR ΔExport
Exp. to Syria (2010)	-212,096*** (-4.084)	-163,529** (-2.547)		-311,789*** (-3.164)	-460,329* (-1.662)	
All exp. to Syria	125,287*** (2.826)	107,683*** (2.633)	43,913 (1.370)	-29,130 (-0.600)	5,722 (0.226)	-116,093** (-2.114)
Firm FE	NO	YES	NO	NO	YES	NO
Observations	43,298	43,298	43,298	23,334	23,334	23,334

*Note: t-values in brackets. *, **, *** indicate significance at 10%, 5% and 1% level respectively. Dependent variable is the absolute difference (in US\$) in firm-level export flow to a specific destination between 2012 and 2010.*

In

Table 8, we test for the transit effect of the war on exports by implementing specification (9). The results suggest again that Lebanese exports to the affected countries have suffered from the war. On average, a firm that was exporting to the affected countries in 2010, experienced by 2012 a drop of US\$ 68,000 in its exports to these countries relative to the other exports of the same firm, as well as to the other exports of firms that were not exporting to Syria in 2010 (column 1). The drop is larger relative to the other exports of the same firm, although the result is not significant (column 2). On the other hand, the transit effect is not significant for the Jordanian firms (columns 3-4), confirming the results above. Unlike the case of the Syrian market, we do not detect any significant replacement effect by Lebanese of Jordanian firms in the affected countries (columns 5-6). These mixed effects of the Syrian war on Lebanese goods' exporters are confirmed by recent anecdotal evidence gathered with Lebanese firms (see box 1).

Table 8: Difference in difference: export to and through Syria, 2010-12

	(1)	(2)	(3)	(4)	(5)	(6)
Country	LBN	LBN	JOR	JOR	LBN	JOR
Dep. Var.	Δ Export	Δ Export	Δ Export	Δ Export	Δ Export	Δ Export
Initial exp. to Syria	-98,764*** (-2.794)	-82,343 (-1.616)	-341,264*** (-3.180)	-454,516* (-1.646)	-212,096*** (-4.084)	-311,789*** (-3.164)
All exp. to Syria					120,410** (2.532)	-30,975 (-0.607)
Initial exp. through Syria	-68,059** (-2.518)	-115,629 (-1.615)	-83,608 (-0.628)	1,857 (0.011)	-77,161*** (-3.518)	-81,487 (-0.598)
All exp. through Syria					16,179 (0.698)	-3,621 (-0.067)
Firm FE	NO	YES	NO	YES	NO	NO
Observations	43,298	43,298	23,334	23,334	43,298	23,334

Note: *t*-values in brackets. *, **, *** indicate significance at 10%, 5% and 1% level respectively. Dependent variable is the absolute difference (in US\$) in firm-level export flow to a specific destination between 2012 and 2010.

In the equations above, the treatment is specified at the firm-destination level. This specification aims to capture the effect of the civil war on exports to the Syrian market specifically. But what happens to the overall exports of a firm that was exporting to Syria before the war? They might lose the Syrian market but this might redirect their exports to other countries or they might end up substituting Syrian exporters in other markets. To start investigating these questions we run the following specifications where treatment is defined at the firm level:

$$\Delta Exp_i = \beta_0 + \beta_1 Syria_i + \varepsilon_{id} \quad (10)$$

where Syria is a dummy that takes the value of 1 if the firm *i* was exporting to Syria in 2010 (regardless of whether it was still exporting in 2012).

Box 1: The Syrian war and Lebanese merchandise exporters

Anecdotal evidence confirms that exporters of goods to Syria have been negatively affected by the war. One example is *Cosmoline*, one of the largest Lebanese manufacturers of personal care products. Prior to the war, it had made substantial investments to expand into the Syrian market establishing a relatively large sale operation in Syria through a sister company in Western Syria employing 150 people, between sales, distribution, logistics, etc. Syria accounted for around 10% of *Cosmoline*'s total sales in 2011. Following the eruption of the Syrian war, the Syrian affiliate has now been shut down and the Syrian market has been largely lost. In addition, their sales to the rest of the Middle East have also suffered due to the increased transport costs. For example, the company has to serve the Iraqi market via sea, which costs three times more than via land. This translates into an additional US\$ 240,000 per month in transport costs.

Another company producing *power generators* has lost the entire Syrian market – which accounted for about a fifth of its total sales - due to the European embargo on Syria (as the two key suppliers of the

company are British and French). Again, the company's ability to serve other Middle Eastern markets has also been disrupted, although that seems to have had only marginal effect on its exports.

A similar story is also that of *Mechaalany*, an agro-industrial company, which had started to tap into the profitable Middle Eastern market of ready-made meals before the eruption of the Syrian war. As the company was launching their ready-to-eat meals line, the Syrian border was closed and the company was unable to deliver the products throughout the Arab world for several months. In order to maintain its customers' base, it began shipping via air and shared the additional shipping costs with its customers (sea freight is not an option due to the short shelf-life of the products). However, this arrangement was not profitable and the company decided to cease the production of this product line.

On the other hand, some other companies, especially in the food and beverage sector, seem to have benefited from the crisis as they were able to replace Syrian production both in Syria and elsewhere. This is the case, for instance, of the brewery producing *961 beer*, the only Lebanese owned beer. The company started its operations shortly before the war, targeting initially the Syrian and the Lebanese markets. After some successful sales to Syria in 2011 (when Syria accounted for about three quarter of total sales), reaching the Syrian market became very difficult in 2012 due to the civil strife and the strict controls put in place by the Syrian government. However, the war also destroyed the main Syrian (state owned) brewery in 2012 and deterred competitors from abroad. This spurred the demand for 961 beer, which was again able to serve the Syrian market while increasing its margins. That lasted until the foreign exchange crisis prevented Syrians from paying for the imports, at which point the company started to aggressively target overseas markets in order to survive. These efforts led to the opening of various international markets allowing the company to stay afloat. In June 2014, the company started exporting to Syria again as the situation has calmed down in the Damascus area, and for the first time the company became profitable.

Source: Authors' interviews with companies

Table 9 presents the results of this specification. These suggest that, both in Lebanon and in Jordan, the change in overall exports of firms exporting to Syria in 2010 has not been systematically different from that of other firms (columns 1-2). In fact, this result masks some important heterogeneity across firms. Overall exports of firms that were relying more heavily on the Syrian market were negatively affected, more so in Jordan (column 4) than in Lebanon (column 3). In Jordan, a 10% increase in the 2010 share of exports to Syria across firms implied a subsequent reduction in overall exports (between 2010 and 2012) by US\$ 89,000. In Lebanon, this figure is only US\$ 19,000. That is why only those exporters with a share of exports to Syria above the median were negatively affected by the war (columns 5-6).

In Table 10, we investigate another type of heterogeneity across Lebanese exporters, i.e. whether overall exports of more diversified exporters to Syria have been less affected by the Syrian war than others. In order to do that, we interact the Syria variable with a number of indicators of diversification, including the number of destinations, the number of (6-digit HS) products exported and the number of product-destinations combinations. However, none of these interaction terms is significant, suggesting that the degree of initial diversification does not seem to be a factor determining the extent of the fallout of the war on Lebanese exporters to Syria.

Table 9: Difference in difference: total exports, 2010-12

Country Dep. Variable	(1) LBN Δ Tot Exp	(2) JOD Δ Tot Exp	(3) LBN Δ Tot Exp	(4) JOD Δ Tot Exp	(5) LBN Δ Tot Exp	(6) JOD Δ Tot Exp
Export to Syria	-322,463 (-1.313)	2,360,359 (0.772)				
Share Exp. To Syria			-185,643* (-1.913)	-889,437** (-2.186)		
Above median export to Syria					-166,845* (-1.818)	-1,042,305** (-1.994)
Below median export to Syria					-359,482 (-0.928)	4,797,029 (0.953)
Export through Syria	98,063 (0.456)	-373,958 (-0.220)				
Share Exp. through Syria			-131,618 (-1.640)	-156,128 (-0.260)		
Above median export through Syria					-26,342 (-0.483)	790,203 (1.582)
Below median export through Syria					140,672 (1.024)	-
Observations	12,525	5,509	12,525	5,509	12,525	5,509

Note: *t*-values in brackets. *, **, *** indicate significance at 10%, 5% and 1% level respectively. Dependent variable is the absolute difference (in US\$) in firm-level export flow between 2012 and 2010.

Finally, we investigate the heterogeneity of the war effects across sectors. As discussed above, some sectors seem to have been less affected by the loss of the Syrian market, for example as replacement effects may have compensated the loss of the Syrian market. We examine this heterogeneity by running specification (10) separately for each of the 1-digit SITC (Rev. 3) sectors. For each firm we compute its total exports in the sector and use that as dependent variable.²⁵ The results, presented in Table 11, confirm significant heterogeneity across sectors. In particular, the Syrian war had a positive effect on Lebanese exporters to Syria in the beverages and tobacco sector, while it had a particularly negative impact on exporters of manufactured goods and of mineral fuels. The transit effect was damaging especially for machinery and transport equipment, exporters of crude materials, mineral fuels and food and live animals. The war had a more negative impact on Jordanian exporters via the loss of the Syrian market, especially for food and live animals, beverages and tobacco and manufactured goods. The negative effect of the war on manufactures for both Lebanese and Jordanian exporters suggest that these products have a high elasticity of demand with respect to the war, somewhat differently from food exports, where replacement effects of Syrian production are also at play.

The firm level analysis suggests that the Syrian war has disrupted activities of exporters to Syria, as well as to countries in the region reached through Syria. The main negative effect was due to the loss of the Syrian market, although this effect was considerably larger for Jordanian than for Lebanese exporters. The latter have managed to contain the losses, and in some cases, such as in the beverage and tobacco sector, have even increased their sales to the Syrian market more than to other destinations. In

²⁵ Therefore some firms that export products in more than a 1-digit sector will have different values of Δ total exports.

fact, the war has also spurred some exports to Syria among Lebanese exporters that were not previously exporting to the country, probably as they replaced the loss of Syrian production and/or the decline in exports to Syria by other countries. This replacement effect was large enough to compensate the negative effect of the war via the loss in the Syrian market. Conversely, Jordanian exporters did not benefit significantly from this replacement effect.

Table 10: Difference in difference: total exports in Lebanon, 2010-12

	(1) ΔTot Exp	(2) ΔTot Exp	(3) ΔTot Exp	(4) ΔTot Exp	(5) ΔTot Exp
Export to Syria	-477,998* (-1.750)	-386,242 (-1.532)			
Export through Syria	-113,492 (-0.654)	155,836 (0.659)			
Nr. destination	-76,428 (-0.893)		-21,086 (-0.440)		
Export to Syria x NrDest	12,082 (0.396)				
Export through Syria x NrDest	82,537 (0.941)				
NrProd		2,179 (1.001)		-1,249 (-0.604)	
Export to Syria x NrProd		7,532 (1.085)			
Export through Syria x NrProd		-8,139* (-1.763)			
Share Syria			-373,890* (-1.910)	366,212*** (-2.752)	327,534*** (-2.901)
Share through Syria			-283,942* (-1.717)	-126,883 (-1.513)	-136,378* (-1.805)
Shr Syria x NrDest			49,056 (0.627)		
Share through Syria x NrDest			44,575 (0.582)		
Shr Syria x NrDest				39,054 (1.554)	
Shr through Syria x NrDest				-674 (-0.107)	
Shr Syria x NrProd-Dest					20,669 (1.349)
Shr through Syria x NrProd-Dest					233 (0.059)
NrProd-Dest					-340 (-0.225)
Observations	12,525	12,525	12,525	12,525	12,525

Note: t-values in brackets. *, **, *** indicate significance at 10%, 5% and 1% level respectively. Dependent variable is the absolute difference (in US\$) in firm-level export flow between 2012 and 2010.

Table 11: Difference in difference: total exports by sector, 2010-12

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dep. variable	Δ Total Exports (2010-12) by the firm in the 1-digit SITC (Rev. 3) sector								
Sector nr.	0	1	2	3	4	5	6	7	8
Sector name	Food & live animals	Beverages & tobacco	Crude mat. ex food/fuel	Mineral fuel	Animal/veg oil/fat/wax	Chemical products n.e.s	Manuf. goods	Machinery & transp equipmt	Misc. manuf arts
Lebanon									
Export to Syria	-67,393 (-0.401)	508,524* (1.700)	39,254 (0.197)	-278,686** (-1.986)	1,479,031 (1.457)	-262,456 (-0.808)	-487,111** (-2.105)	-714,473 (-0.926)	-45,433 (-0.362)
Export through Syria	-54,772* (-1.829)	91,890 (0.822)	-509,466* (-1.869)	-283,620** (-2.020)	-59,220 (-0.981)	67,038 (1.078)	-29,494 (-0.716)	-299,682* (-1.662)	47,004 (0.755)
Observations	1,829	435	1,040	333	638	2,412	4,960	5,083	5,567
R-squared	0.003	0.089	0.008	0.001	0.149	0.004	0.011	0.005	0.000
Jordan									
Export to Syria	-2,054,870* (-1.910)	-1,954,213*** (-3.287)	-2,517,368 (-0.870)	780,040 (0.910)	-22,682 (-0.698)	1,179,935 (0.868)	-2,430,349** (-2.098)	-122,841 (-0.110)	3,810,358 (1.211)
Export through Syria	-823,634** (-1.986)	-1,725,718** (-2.032)	4,960,759 (0.964)	1,011,681 (0.968)	-131,675* (-1.938)	558,919 (0.353)	-1,678,397* (-1.674)	-1,673,857 (-1.496)	-553,152 (-0.539)
Observations	1,638	479	664	44	121	1,522	2,077	1,168	2,737
R-squared	0.063	0.157	0.023	0.002	0.004	0.003	0.002	0.022	0.012

Note: t-values in brackets. *, **, *** indicate significance at 10%, 5% and 1% level respectively. Dependent variable is the absolute difference (in US\$) in firm-level total sectoral export flow between 2012 and 2010.

6. Do refugees' inflows affect trade?

Strong linkages made Lebanon the main refuge for Syrians escaping the violence that has afflicted their nation. In both absolute and relative terms, Lebanon has hosted more Syrians refugees than any other country, including Jordan and Turkey. As of December 23, 2014, the UNHCR registered 1,143,476 Syrian refugees in Lebanon, with more awaiting registration, bringing the total persons of concern to 1,156,159. This is equivalent to over 25 percent of the population, making it a massive influx of population over a relatively short period of time. In addition, Lebanon's open border policy with Syria allowed many more Syrians to opt not to register with the UNHCR.

Gauging the economic impact of Syrian refugees on Lebanon necessitates a dissection away from the impact of the overall Syrian crisis. As the former organically emanates from the latter, there is a high correlation between these two impacts, making the dissection a more complex exercise. While the Syrian conflict has had unequivocally grave and adverse effects on the Lebanese economy, a segmentation of the impact of the refugees offers a more qualified assessment.

The massive demographic shock generates dramatic socio-economic ripples in Lebanon. These are articulated in a World Bank report (2013b), *Lebanon Economic and Social Impact Assessment of the Syrian Conflict*, which identified fiscal and social costs associated with Syrian refugees.²⁵ The study estimated that between 2012 to 2014, Lebanon could incur fiscal costs amounting to US\$308-US\$340 million due to additional spending on health, education and social safety nets. Moreover, US\$1.4-1.6 billion (3-3.4 percent of GDP) will be needed for stabilization—i.e., to restore access to and quality of these services to pre-conflict levels. The report also identified the negative and material effects on poverty, livelihoods, health and human capital conditions of the Lebanese people; by end-2014, the study at the time projected that 170,000 additional Lebanese would be pushed into poverty.²⁶ Furthermore, an additional 220,000-324,000 Lebanese, primarily unskilled youth, would become unemployed, thus doubling the unemployment rate to over 20 percent. Furthermore, the influx of refugees has challenged the already weak public social services sector in Lebanon, while social tensions, including gender issues, between the refugees and Lebanese communities are on the rise.²⁷

However, growth has remained positive, even as it tumbled from exceptionally high rates prior to 2011. Consumption and investment by the Syrians (refugees or otherwise) offer an explanation as to why the economy has remained afloat. Syrian relocation to Lebanon also included the rich and the elite, who have a high spending power. Poorer Syrian refugees also consume basic consumption goods. Furthermore, the longer the Syrians are refuted, the more likely they make more medium to long-term economic adjustments that might benefit the host country. Additionally, international aid money destined to organizations that are assisting the Syrian refugees, such as the various UN agencies, strengthen inflows boosting the balance of payments (BoP), and reinforce the Lebanese pound.

In this section, we examine the impact of Syrian refugees on Lebanon's Balance of Payments, especially its trade components. Again, a dissection of the impact of Syrian refugees from that of the overall crisis is essential. Lebanon is significantly exposed to Syria, not only due to its role as a trading partner, but

²⁵ The study was published in August 2013. Hence, while some figures have become outdated, it remains the most comprehensive assessment of the economic impact of the Syrian crisis on Lebanon.

²⁶ Source: World Bank (2013b).

²⁷ Source: World Bank (2013).

also because a sizable share of Lebanese trade transits through Syria.²⁸ On the other hand, Syrian refugees might encourage trade across the border as their movement between the two countries has increased significantly. This dynamic might be especially relevant as Syria lost much of its productive capacity across all sectors. In addition, inflows can be reinforced by the presence of refugees, whether due to international aid, or Syrian remittances from the GCC countries or bank deposit transfers to Lebanon.

6.1. Data

We utilize UNHCR data for the number of Syrian refugees in Lebanon. Specifically, two measures are used (i) *RR*, UNHCR-registered Syrian refugees in Lebanon and (ii) *RT*, total persons of concern (UNHCR-registered plus those awaiting registration). Furthermore, to separate the impact of the Syrian refugees from that of the Syrian war, we use Syrian refugees in other countries (Jordan, Turkey and Iraq), *R*, as a proxy for security conditions in Syria. A more detailed description of the data is presented in Table 2 in the appendix.

We estimate the impact of Syrian refugees on critical BoP variables. These are, namely, (i) exports of services, *S*, which constitute around 80% of total exports in Lebanon, helping to partially offset the large and persistent trade in goods deficit; (ii) imports of food, *F*, allowing us not only to gauge the refugee-induced increase, but also whether it also involved a shift in quality and price, (iii) imports of capital goods, *K*, to examine whether a larger population encourages local manufacturing; (iv) imports of consumption goods, *P*, to again detect changes, if any, in quantity and quality; (v) inflows of remittances, *MI*, which would capture remittances sent by expatriate Syrians, specifically those based in the GCC countries, to their displaced families in Lebanon; (vi) outflows of remittances, *MO*, to examine if Lebanon is a source of employment for displaced Syrians; and (vii) BoP errors and omissions, which includes other activities that are not identified. As a control variable for economic activity, we also use the coincident indicator, *Y*.²⁹ All variables are in a monthly frequency.

For a casual observation, we plot the BoP variables along with the number of Syrian refugees. These plots, which are presented in Figure 2 in the appendix, suggest that *RR* has a positive correlation vis-à-vis each of *MI* and *MO*, and a negative correlation vis-à-vis *S*. It also suggests that Syrian refugees led to a deceleration in economic activity and food imports, as proxied by *Y* and *F*, respectively. We are not able to discern a clear relationship between *RR* and each of *K*, *P* and *E*.

6.2. Methodology

We use vector auto regressions (VARs) for a more empirical assessment of the impact of Syrian refugees on the BoP variables. A VAR methodology presents a number of advantages. To begin with, it offers a convenient approach to examine the effects between variables that have no obvious structural relationship, a condition that applies in this study. Additionally, it generates the response of one variable to a shock in another. This is highly relevant to our case in which there is a clear shock represented by the influx of Syrian refugees. Another advantage is that, instead of making assumptions on the causality between the variables, we are able to test for it.

²⁸ Source: World Bank (2013).

²⁹ As national accounts in Lebanon are only available with a significant time lag, World Bank staff have developed two new indicators, a Coincident Indicator and a Leading Indicator to better assess recent economic developments (Matta (2014)).

We process the raw data. This first involves seasonally adjusting the following variables: Y, S, F, K, P, MI, MO and E . We then take the percentage change for all variables and denote those in lower case: $y, rr, rt, r, s, f, k, p, mi, mo$ and e .

We can now specify the VARs:

$$X_t = a_0 + a_1X_{t-1} + a_2X_{t-2} + \dots a_nX_{t-n} + b_0Z_t + b_1Z_{t-1} + a_2Z_{t-2} + \dots a_nZ_{t-n} + \varepsilon_t$$

where $X = \{rr, y, B\}$ is the vector of endogenous variables, such that B stands for each of the seven BoP variables: s, f, k, p, mi, mo and e . While we are mainly interested in the interaction between rr and the B variables, the specification would be lacking if we do not include y as an endogenous variable, since economic activity is crucial to the relationship. Z is a vector of exogenous variables $\{r, Ds1, Ds2, Dbp\}$. We include r ³⁰ as an exogenous variable to proxy for the Syrian war in order to dissect the impact of the Syrian refugees from that of the war. We also include dummy variables to proxy for the security situation in Lebanon. We distinguish between one day security incidents, $Ds1$, such as car explosions, and multi-day incidents, $Ds2$, such as the Tripoli fighting, since each might have a distinct impact.³¹ Additionally, we include a dummy for the balance of payments, Dbp , due to divergence in BoP data between BdL, on one hand, and IMF and UNCTAD, on the other, which became pronounced starting in 2011.³² The estimated coefficients are denoted by a_n and b_n , such that n ranges sequentially from 0 to the maximum lag length chosen for the VAR. Lastly, $\varepsilon = (\varepsilon_{rr}, \varepsilon_y, \varepsilon_B)$ denotes the error vector of the VAR system.

In sum, we estimate seven VARs using monthly frequency. Each VAR is composed of three endogenous variables— rr, y and one of the B variables—and the exogenous variables— $r, Ds1, Ds2, Ds3$. We label the seven VARs appropriately after the B variable: $V(s), V(f), V(k), V(p), V(mi), V(mo)$ and $V(e)$. For our estimations, we choose the time period from January 2009 to August 2014, subject to data availability³³. This allows us to first account for the relationship between y and the B variables before the Syrian war, when rr was effectively zero, and then introduce the effects of Syrian refugees. As a robustness test, we substitute in rt ³⁴ in place of rr and re-estimate the VARs.

In order to generate impulse response functions from the VARs, we employ the Cholesky decomposition identification methodology. To that end, we choose the ordering specification (rr, y, B) , such that each endogenous variable affects the variables on its right instantaneously, while impacting those on the left with a lag. Hence, we are assuming that the influx of Syrian refugees impacts economic activity and the balance of payments instantaneously, and that economic activity also affects the balance of payments instantaneously. These are reasonable ordering assumptions while other orderings are not as reasonable.

³⁰ Recall, r represents the change in total persons of concern (UNHCR-registered Syrian refugees as well as those waiting registration) in Jordan, Turkey and Iraq.

³¹ Security incidents are specified in Table 3 in the appendix.

³² This divergence is expounded on in section 3.

³³ As illustrated in Table 21, data for a number of variables are not always available until August 2014, restricting corresponding VAR estimations to a shorter time period.

³⁴ Recall, rt represents the change in total persons of concern (UNHCR-registered Syrian refugees as well as those waiting registration) in Lebanon.

6.3. Empirical results

We begin by conducting unit root tests for all variables. To do so, we use the Dickey-Fuller with GLS detrending (DF-GLS) test and the Phillips-Perron (PP) test for confirmation. The results are presented in Table 4 in the appendix. According to the DF-GLS and PP tests, the null hypothesis of a unit root is rejected at the 1 or 5 percent significance level for y , rr , rt , r , S , s , F , f , K , k , P , p , MI , mi , mo , E and e .

VAR lag lengths are chosen optimally to pass the residual tests of no serial correlation, normality and no heteroscedasticity. For this purpose, we use the Breusch-Godfrey Lagrange multiplier test (LM test) for serial correlation, multivariate extensions of the Jarque-Bera test to detect normality and the White test for heteroscedasticity. The null hypotheses for these tests indicate that the residuals are not serially correlated, are normally distributed and are not heteroscedastic, respectively. Ideally, we want to choose a VAR lag length at which VAR residuals pass all three residual tests of no serial correlation, normality, and no heteroscedasticity.

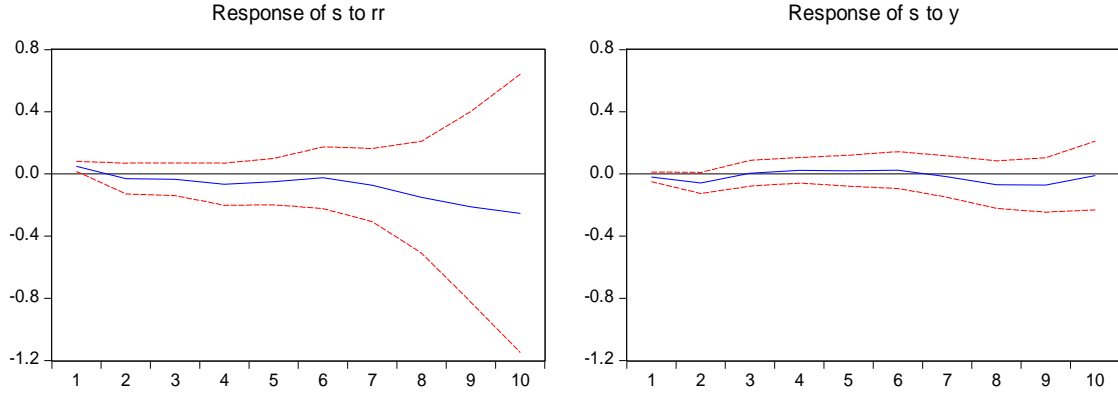
None of the estimated VARs passed all three residual tests at any lag lengths, posing caveats on the estimations. In particular, there was difficulty with passing the normality test. As a second best criterion, we choose the VAR lag length at which the VAR residuals pass the serial correlation and normality tests, ignoring heteroscedasticity. These we indicate in blue font in Table 1 below. If at no lag length does the VAR pass the normality test, then we choose the largest lag length at which the VAR passes the serial correlation and the heteroscedasticity tests, ignoring the normality test. These VARs we note in brown font in Table 12. The results of the residual tests at the chosen lag lengths are presented in Table 5 in the appendix. Residuals for $V(k)$, $V(f)$, $V(p)$ and $V(mi)$, estimated using lag lengths 8, 8, 8 and 7, respectively, pass the LM serial correlation and the White heteroscedastic tests, but they fail the Jarque-Bera normality tests. Residuals for $V(s)$, $V(mo)$ and $V(e)$, estimated at higher lag lengths of 12, 12 and 13 respectively, pass the serial correlation and normality tests, but the heteroscedasticity tests are inconclusive due to low degrees of freedom.

Table 12: VAR Estimations.

VAR	Endogenous Variables	Exogenous Variables	Lag Length	Sample Period
$V(s)$	rr, y, s	$r, Ds1, Ds2, Dbp$	12	Jan 09-Dec 13
$V(f)$	rr, y, f	$r, Ds1, Ds2, Dbp$	8	Jan 09-Jun 14
$V(k)$	rr, y, k	$r, Ds1, Ds2, Dbp$	8	Jan 09-Jun 14
$V(p)$	rr, y, p	$r, Ds1, Ds2, Dbp$	8	Jan 09-Jun 14
$V(mi)$	rr, y, mi	$r, Ds1, Ds2, Dbp$	7	Jan 09-Dec 13
$V(mo)$	rr, y, mo	$r, Ds1, Ds2, Dbp$	12	Jan 10-Dec 13
$V(e)$	rr, y, e	$r, Ds1, Ds2, Dbp$	13	Jan 09-Jun 14

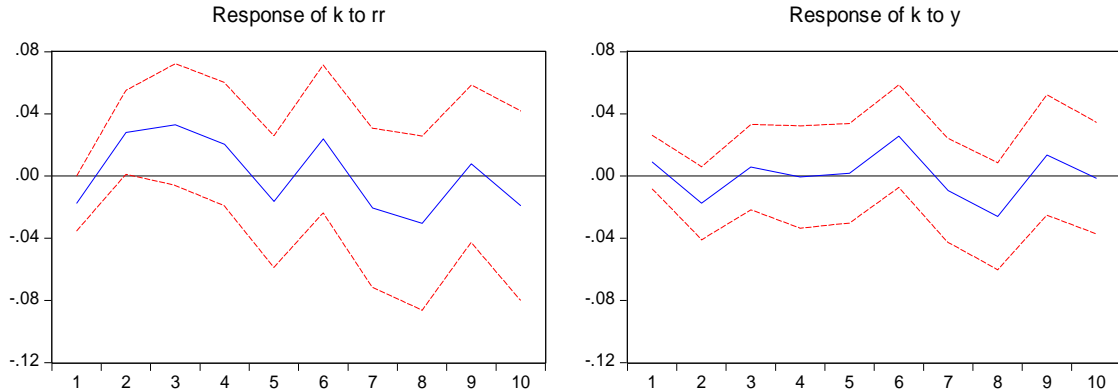
We now generate impulse response functions (IRFs) for each VAR. These are presented in figures A2 to A8 in the appendix, the most interesting of which is summarized below:

I. The IRFs for VAR $V(s)$:



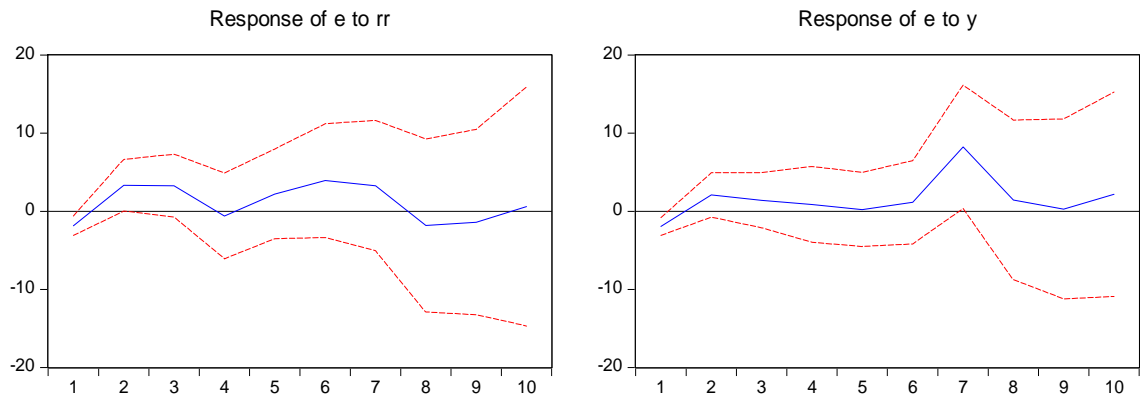
- a) s reacts positively and significantly to a positive shock in rr . This could be evidence that Syrian refugees act as linkages that encourage Lebanese exports of services.
- b) s reacts negatively but insignificantly to a positive shock in y . This is likely a reflection that exports in general are not a primary driver of economic activity, and at times when exports of services might have been robust (weak), economic activity was weak (robust) for independent reasons.

II. The IRFs for VAR $V(k)$:



- a) k reacts negatively and significantly to a positive shock in rr . A large portion of Lebanon capital imports are produced in the region and transported via Syria, especially Damascus. Proximity dictates that many of the Syrian refugees in Lebanon come from Damascus and the surrounding areas. As such, an increase in Syrian refugees to Lebanon, but not to neighbouring countries, could be signalling localized security deterioration around Damascus, negatively impacting capital imports.
- b) k reacts insignificantly to a positive shock in y , potentially reflecting that the manufacturing sector is not a primary driver of economic activity in Lebanon.

III. The IRFs for VAR $V(e)$:



- a) e reacts negatively and significantly to a positive shock in rr .
- b) e reacts negatively and significantly to a positive shock in y . This suggests that increased economic activity is naturally occurring in the main drivers of the economy, which the BoP more accurately categorizes, and less so in the sectors that are not observed in the BoP.

IV. The other VARs fail to produce significant effects for the BoP variables.

V. As a robustness test, we use rt in place of rr in all the VARS. The results do not vary qualitatively.

VI. Excluding the BoP dummy variable, Dbp , also does not qualitatively alter the results.

We test for Granger causality in the VARs. The only significant causality result relating to the BoP variables are the following:

I. VAR $V(s)$:

Dependent variable: rr

Excluded	Chi-sq	df	Prob.
y	19.08446	12	0.0865*
s	26.43491	12	0.0093***
All	54.21440	24	0.0004

*, **, *** denote rejection of the null hypothesis at the 10%, 5% and 1% significance levels, respectively.

- a) Both y and s Granger cause rr . This is evidence in support of an economic incentive for the Syrian refugees.

II. VAR $V(mo)$:

Dependent variable: rr			
Excluded	Chi-sq	df	Prob.
y	48.79540	12	0.0000***
mo	42.58683	12	0.0000***
All	83.78620	24	0.0000

*, **, *** denote rejection of the null hypothesis at the 10%, 5% and 1% significance levels, respectively.

- a) Both y and mo Granger cause rr . This is further evidence in support of an economic incentive.

To gauge the impact of Syrian refugees on s , k and e , we perform OLS estimations. We take the VAR structure as a starting point for our estimations, keeping in mind the need to limit the number of regressors in order to increase the degrees of freedom. For the impact on s , we begin with the following OLS specifications:

$$s_t = c + \sum_{i=0 \rightarrow n} (\alpha_i rr_{t-i}) + \sum_{j=0 \rightarrow q} (\beta_j y_{t-j}) + \gamma r_t + \delta Ds1_t + \eta Ds2_t + \theta Dbp_t + \varepsilon_t$$

where c is a constant; α , β , γ , δ , η and θ are coefficients to be estimated; and ε is the residual. We choose n to be 12, in consistency with the maximum lag length in VAR $V(s)$, and q to be 3. We proceed to estimate the equation. We begin by checking the significance of the coefficients for the dummy variables $Ds1$, $Ds2$ and Dbp , dropping the ones that are insignificant. We also check if y_{t-1} , y_{t-2} and y_{t-3} , are significant, dropping those which are not. Lastly, denoting the highest lag at which α_i is significant as l , we drop rr_{t-i} for $i > l$.³⁵ In such a way, we eliminate excessive regressors and raise the degrees of freedom of the estimation. We follow the same procedure to estimate the k and e equations. Results are presented in Tables 6, 7 and 8 in the appendix. The only significant result is that of the equation for s , which suggests that:

- The coefficient for rr_{t-2} is significant at the 5 percent level.
 - i. A one percent increase in rr_{t-2} induces a 1.6 percent increase in s .
- The coefficient for rr_{t-3} is significant at the 10 percent level.
 - i. A one percent increase in rr_{t-3} induces a 1.5 percent decrease in s .
- The coefficient for rr_{t-7} is significant at the 10 percent level.
 - i. A one percent increase in rr_{t-7} induces a 1.6 percent increase in s .

We run the regression again, combining all lags for the variable rr in order to quantify the overall impact of rr on s . The results are presented in:

Dependent Variable: DS
 Method: Least Squares
 Sample (adjusted): 2009M08 2013M12
 Included observations: 53 after adjustments

³⁵ If all α_i are insignificant, we drop rr_{t-i} for $i > 0$.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
c	0.004799	0.021829	0.219819	0.8269
(rr ₀ + rr ₁ + rr ₂ + rr ₃ + rr ₄ + rr ₅ + rr ₆ + rr ₇)	0.003737	0.003269	1.143262	0.2585
y	1.746999	1.318711	1.324778	0.1914
r	-0.104727	0.054601	-1.918062	0.0609*
R-squared	0.087546	Mean dependent var		0.004329
Adjusted R-squared	0.031681	S.D. dependent var		0.134967
S.E. of regression	0.132812	Akaike info criterion		-1.127290
Sum squared resid	0.864314	Schwarz criterion		-0.978589
Log likelihood	33.87319	Hannan-Quinn criter.		-1.070107
F-statistic	1.567106	Durbin-Watson stat		2.689151
Prob(F-statistic)	0.209249			

*, **, *** denote rejection of the null hypothesis at the 10%, 5% and 1% significance levels, respectively.

- The coefficient for (rr₀+ rr₁+ rr₂+ rr₃+ rr₄+ rr₅+ rr₆+ rr₇) is not significant.
 - i. The overall impact is positive, but minute and insignificant.

The low quality of data has limited our ability to obtain stronger results. Data caveats include strong divergence from other sources as well as frequent and large revisions of historical values. The lack of significance in many of the IRFs and OLS estimations is likely a result of data quality.

A challenge that emerged is the extent to which we can dissect the impact of Syrian refugees from that of the war overall. These impacts have been especially conflated when security is localized in areas proximate to Lebanon, which the variable r does not capture. We have seen this conflation in the IRF for $V(k)$.

The results have proved sensitive to lag lengths. We have been biased toward higher lag lengths since as we increased the lag length, we found the impulse response functions becoming more significant. This makes sense for two reasons. First, the degree of integration of the Syrian refugee into the Lebanese economy increases with time, as financial and economic adjustments are made. Initially, refugees might be more dependent on hand-outs and aid, but as they become aware of the long-term nature of the conflict, seeking income sources within the Lebanese economy becomes more crucial.

Second, the refugees in Lebanon variables (rr and rt) are to a large extent highly correlated with the security situation in the region, which has a strong but distinct impact on Lebanon. While we try to account for the security situation by including the variable r as an exogenous variable in the VARs, it is unlikely to completely net out regional security effects from rr and rt . However, rr and rt are more likely to describe the impact of the refugees at higher lags for the reasons explained in (i) above. As such, the higher the lag length, the more likely the response is driven by Syrian refugees and not regional security.

7. Discussion and policy implications

The report has analysed one of the main channels through which the Syrian civil war has affected the Lebanese economy, i.e. the trade channel. It has used a variety of analytical instruments to find - perhaps surprisingly - that the Syrian war has so far had a mixed impact on Lebanese trade.

The war has reduced the Syrian demand for goods and services, including of Lebanese origin. Using custom transaction data, we found that on average an exporter of goods to Syria before the war lost US\$ 90,000 in exports to Syria by 2012, around a quarter of the average pre-crisis export level to Syria. While this effect is significant, it is much smaller than the effect for Jordanian exporters. This is also confirmed by the gravity analysis, which reveals that the effect of the war on aggregate exports to Syria has been smaller for Lebanon than for Turkey and Jordan.

This effect of the war has been heterogeneous across exporters. It has mainly affected exporters who are highly exposed to the Syrian market, while it has not had a significant impact on relatively marginal exporters. The heterogeneity is also across sectors. Lebanese exports to Syria in the beverages and tobacco sector and to some extent food benefited from the war as they replaced some of the lost production in Syria. For example, exports of wheat to Syria increased 14-fold between 2011 and 2013. On the other hand, the crisis had a particularly negative impact on exporters of manufactured goods, a result common to Jordanian exporters as well, and of mineral fuels.

The war has also increased the cost of trading through Syria, which is the only overland connection with the rest of the world for Lebanon. This effect has caused the re-direction of much of the trade through Syria towards sea trade mainly through the Port of Beirut. This re-direction has helped contain the effect of the increased trade costs and the data do not show any clear effects of the Syrian war on Lebanese merchandise imports. Firm-level exports to countries served through Syria have declined somewhat although by less than Syrian exports.

On the other hand, the Syrian war has also generated opportunities for Lebanese exporters to replace the loss of Syrian production in the Syrian and other markets. The firm-level analysis shows that the war has spurred some exports to Syria among Lebanese exporters that were not previously exporting to the country. This replacement effect was large enough to offset the negative effect of the war for exporters via the loss in the Syrian market. Conversely, Jordanian exporters did not benefit significantly from this replacement effect, thus the effect of the war has been on average negative for the individual Jordanian exporter. This confirms the evidence from the gravity analysis of the greater ability of the Lebanese traders to adapt to the war environment in Syria, relative to their counterparts in the other Syria neighbouring countries.

Services dominate the Lebanese export sectors, being 4-5 times larger than goods' exports. Thus, much of the overall impact of the civil war on trade depends on the effects on services. Unfortunately the data quality does not allow a neat assessment of these effects. In particular, data from different sources paint a different trend in services exports in the 2011-13 period. We present a wealth of other data on domestic services turnover and on foreign investments to provide suggestive evidence that the declining trend in services exports derived from BdL data may be less accurate than the stable or increasing trend derived from the IMF or UNCTAD data.

Excluding Syrian and Lebanese nationals, the number of visitors into Lebanon declined by 23% between 2010 and 2011 and further 15% in 2012 and 2% in 2013. The first four months of 2014 witnessed a further decline of 16% vis-à-vis the same period in 2014. To a large extent, this reflects bans, formal or informal, that several countries have placed on travel to Lebanon due to security incidents and political disagreements, arguably mostly the result of infighting in Syria spilling over to Lebanon.

While tourism receipts have suffered the fallout of the Syrian war, the other services sectors have mostly proven resilient to the war. Contrary to most economies in the region, Lebanon's services exports do

not rely exclusively on exports of transport and tourism, but rather expand to cover modern sectors like financial, real estate and business services. Overall, non tourism services exports have grown unabatedly during the Syrian war. Even the real estate sector that contracted in 2010-12, most likely from the spillovers of the Syrian conflict, rebounded in 2013. And the financial sector has remained resilient through the crisis despite some loss of profitability of the Syrian affiliates of major Lebanese banks.

The VAR analysis in the report suggests that at least part of the resilience of the services exports and production is related to the increased demand for Lebanese services spurred by Syrian refugees. While the large refugees' inflow has had a wider socio-economic impact, some of which the World Bank (2013b) has discussed in detail, our analysis also show that a 1% increase in refugees' stock increases services exports by about 1.5%.

There are a few early signs of recovery for the tradable sector negatively affected by the Syrian war, although it is far too early to assess whether they will turn into a sustainable recovery of these sectors. Both imports and exports through Syria have started to recover since the early months of 2014. Kafalat loans to small and medium enterprises have started to grow again, albeit modestly in the first six months of 2014. Anecdotal evidence suggests that some exports to Syria have resumed in the last few months. The transport sector seems to be adapting to the new conditions in the region, for example a new sea line serving Iraq from the Port of Tripoli was launched a few days ago, which would allow the avoidance of the inter-modal transport system via Turkey. In addition, the amount of bookings along with the recent lifting of the travel ban by the Gulf countries gave hopes for a recovery of the tourism industry.

However, the deterioration of the security conditions may quickly reverse these early signs. The trade prospects of Lebanon will crucially depend on a number of factors mainly linked to the Syrian war and to its regional spillovers:

- a) Domestic security conditions: this is possibly the single most important threat as it would directly undermine domestic and foreign investments and demand.
- b) Evolution of the war in Syria: this will determine the relevance of Syria as a trading partner, the viability of using Syria as a transit country, as well as the potential for spillovers in the region.
- c) Evolution of the incipient war in Iraq: Iraq is an important trading partner of Lebanon, as well as a key country for the stability of the entire region with its delicate Sunni-Shia equilibrium. A full blown civil war in the country could have paramount consequences for the trade and the economies in the region and beyond.
- d) Economic and social sustainability of the Syrian refugees: the main risk for trade relates to the social tension within the Lebanese society that the refugees' presence may ignite.

A close and continuous monitoring of these trends is necessary to prevent possible negative fallout of the Syrian civil conflict on the neighbouring economies and beyond.

On the basis of the results of the analysis, we can develop some tentative policy implications. First, it would be important to provide support to affected firms and workers. Firms heavily reliant on the Syrian and Middle Eastern markets have been particularly affected by the conflict, suggesting that help to diversify towards other markets would be appropriate.

In the same vein, supporting workers laid off by firms negatively affected by the conflict would be important not only for the welfare of the workers and their households, but also to ensure the domestic

stability of the country. Lebanon fits the profile of a fragile country, whose stability is particularly vulnerable to adverse economic shocks (Cali, 2015).

Given the disruptions to overland trade induced by the conflict, it seems appropriate to assist with the development of alternative transport arrangements. While the existing spare capacity of the Port of Beirut has allowed to avoid delays from the additional traffic, the potential for increasing merchandise trade hinges mainly on port infrastructures, at least until the security situation in Syria doesn't allow for the unhindered passage of goods.

The report shows that registered Syrian refugees provide the main impetus to Lebanese services exports. This suggests that a more formal integration of the refugees is important to maximize the benefit of their presence on the Lebanese economy. Given the sheer size of the refugees' stock in the country, external support would be needed for their integration.

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Appendix 1

Table A1: Changes in exports by product and year

2009-2010		2010-2011		2011-2012		2012-2013		2013-2014 (Jan.-Oct.)	
Best performers									
Vehicles	7.5%	Pearls and precious metals	9.0%	Pearls and precious metals	5.4%	Mineral fuels and oils	5.5%	Books & newspapers	1.0%
Electrical machinery	3.8%	Iron and steel	1.4%	Mineral fuels and oils	2.0%	Nuclear reactors	0.7%	Inorganic chemicals	0.6%
Nuclear reactors	2.8%	Preparations of vegetables	0.5%	Copper	1.3%	Copper	0.7%		
Iron and steel	2.5%	Fertilisers	0.5%	Miscellaneous manuf.	0.6%	Edible vegetables	0.6%		
Copper	1.5%	Pharmaceuticals	0.5%	Books & newspapers	0.6%				
Inorganic chemicals	1.0%								
Fertilisers	0.7%								
Worst performers									
Articles of iron or steel	-0.3%	Salt; sulphur; earths and stone	-0.5%	Inorganic chemicals	-0.7%	Fertilisers	-0.3%	Fruit and nuts	-0.5%
Salt; sulphur; earths & stone	-0.8%	Printed books & newspapers	-0.8%	Fertilisers	-0.8%	Salt; sulphur; earths and stone	-0.5%	Nuclear reactors	-0.6%
		Electrical machinery	-1.5%	Electrical machinery	-1.2%	Inorganic chemicals	-0.8%	Electrical machinery	-1.3%
		Nuclear reactors	-3.8%	Paper and paperboard	-1.4%	Pearls and precious metals	-21.3%	Iron and steel.	-1.3%
		Vehicles	-7.6%	Iron and steel	-2.3%			Copper	-2.7%
								Pearls and precious metals	-6.8%
								Mineral fuels and oils	-8.7%
Total	22%		0.3%		5%		-12%		-19%
w/o fuel	22%		0.3%		7%		-7%		-27%

Source: Lebanese customs

Appendix 2: Average treatment effect of the Syrian war

The dummy variables $Treatment_{ijt}$ introduced in equation (2) captures the average treatment effect of the Syrian war on a country pair. Similarly to Baier and Bergstrand (2007), it can be shown that:

$$ATE(\mathbf{q}) \equiv E(x_{ij}^1 - x_{ij}^0 | \mathbf{q}, War) \quad (A1)$$

where $x_{ij}^1(x_{ij}^0)$ denotes the logarithm of the trade flow from i to j with (without) the Syrian war; E is the expectation operator; \mathbf{q} is a vector that includes the standard gravity variables; and War denotes one of the treatment dummies listed above.

In order to simplify, let's assume for the moment that observations of x are independently and randomly distributed, so that the treatment of one pair does not affect another pair's trade flow. In reality we do not observe the ATE, but only a trade flow in the presence or absence of the war; hence, let's define the observed outcome (x) for a country pair as:

$$x \equiv (War)x^1 + (1 - War)x^0 \quad (A2)$$

where $War = 1$ if the Syrian conflict is on and 0 otherwise (we dropped the country subscripts to simplify notation). Assuming that trade flows x^1 and x^0 take a standard gravity form, then:

$$x^0 = \mu_0 + \beta' \mathbf{q} + \eta_0 \quad (A3)$$

$$x^1 = \mu_1 + \beta' \mathbf{q} + \eta_1 \quad (A4)$$

Substituting (A3) and (A4) into (A2) yields:

$$x = \mu_0 + \beta' \mathbf{q} + \alpha War + \eta_0 + War(\eta_1 - \eta_0) \quad (A5)$$

where $\alpha = \mu_1 - \mu_0$ corresponds to the average treatment effect.

A consistent estimation of parameters in (A5) depends on the correlations between the variables and the error terms; in particular, the correlation between (i) War and η_0 and (ii) between War and $(\eta_1 - \eta_0)$, which captures the correlation of War with differences in unobservables for partners to which the War dummy applies versus partners to which it does not. Correlation (i) is associated to endogeneity problems and omitted variable bias; correlation (ii) is associated to selection bias.

We believe that the Syrian conflict is a truly exogenous shock and there cannot be a selection bias in being a neighbor of Syria when it is undergoing a conflict. As for possible endogeneity bias, the question is whether there is some third variable z that simultaneously influences the war in Syria and the volume of trade. Specification (3) provides additional robustness checks in this direction.

Appendix 3: Additional Table for the firm-level analysis

Table A2: Diff-in-Diff: Robustness with average change in exports, 2008-10 vs. 2010-12

	(1)	(2)	(3)	(4)	(5)	(6)
	All	All	All	All	All	All
	LBN	LBN	JOR	JOR	LBN	JOR
	Δ avg. exp.	Δ avg. exp.	Δ avg. exp.	Δ avg. exp.	Δ avg. exp.	Δ avg. exp.
Initial exp. to Syria (2008-10)	-50,268* (-1.913)	-41,877* (-1.855)	- 153,921*** (-2.627)	- 225,945** * (-3.006)		
Above median initial exp to Syria (2008-10)					-97,552* (-1.953)	- 333,798** * (-2.582)
Below median initial exp to Syria (2008-10)					-1,495 (-0.094)	5,274 (0.169)
Observations	43,298	43,298	23,334	23,334	43,298	23,334

Appendix 4: Additional Tables and Graphs for the refugees' analysis

Table A3: Data Specifications

Description	Symbol	Units	Source	End Date
World Bank Coincident Indicator	Y	Index (2004=100)	World Bank	June 2014
Stock of registered Syrian refugees in Lebanon	RR		UNHCR	August 2014
Stock of persons of concern in Lebanon*	RT		UNHCR	August 2014
Stock of persons of concern in other countries†	R		UNHCR	August 2014
Exports of services	S	US\$ millions	BdL (BoP)	December 2013
Imports of food	F	US\$ millions	Customs	August 2014
Imports of capital goods	K	US\$ millions	Customs	August 2014
Imports of consumption goods	P	US\$ millions	Customs	August 2014
Inflows of remittances	MI	US\$ millions	BdL (BoP)	December 2013
Outflows of remittances	MO	US\$ millions	BdL (BoP)	December 2013
BoP errors & omissions	E	US\$ millions	BdL (BoP)	August 2014
Dummy variable for the presence of government**	Dg			
Dummy for one day security events‡	Ds1			
Dummy for multi-day security events‡	Ds2			
Dummy for BoP changes***	Dbp			

* Those include UNHCR-registered Syrian refugees plus Syrians awaiting registration in Lebanon.
† Those include UNHCR-registered Syrian refugees plus Syrians awaiting registration in Jordan, Turkey and Iraq.
** Dg takes the value 0 for when there was no government and 1 for when there were a government.
‡ Ds1 and Ds2 take the value 0 for no security event and 1 for a security event
*** Db takes the value 0 until Dec. 2011 and 1 afterwards.

Table A4: Security Incidents in Lebanon

Date	Security Incident
June 17, 2011	Clashes in Tripoli.
February 11, 2012	Clashes in Tripoli.
April 29, 2012*	Clashes in Tripoli.
May 20, 2012	Shooting kills Sunni cleric, Ahmad Abdel Wahid.
May-July, 2012	Clashes in Tripoli continued.
August 2012	Clashes in Tripoli intensify.
October 19, 2012	Assassination of Brig. Gen. Wissam al-Hassan, head of the Internal Security Forces' Information
May 26, 2013	Rockets target the Beirut suburbs.
June 21, 2013	Rocket launched towards Aley, southeast of Beirut.
June 23, 2013	Clashes in Sidon.
July 9, 2013	Car bomb explodes in Bir al-Abed (Beirut's southern suburbs).
August 1, 2013	Rockets launched towards Baabda Palace.
August 15, 2013	Car explosion in Ruwaiss, southern Beirut suburb.
August 23, 2013	Twin bombings in Tripoli.
November 19, 2013	Suicide bombers target the Iranian Embassy in Beirut.
December 17, 2013	A car bomb targeting a Hizbollah base on a road linking the Bekaa villages of Sbouba and Hrabta
December 27,	Assassination of Mohammed Shatah, former Minister of Finance & prominent Future movement
January 2, 2014	Bombing in Haret Hreik.
January 16, 2014	Suicide attack in Hermel.
January 21, 2014	Suicide bombing in Haret Hreik
February 1, 2014	Suicide bombing in the town of Hermel in the Bekaa Valley
February 19, 2014	Twin bombings target Iranian Cultural Center in Beirut.
March 16, 2014	Suicide bombing in small town of Nabi Osmane in Bekaa
June 20, 2014	Suicide bombing and assassination attempt of Major General Abbas Ibrahim in Bekaa, Damascus
June 24, 2014	Suicide bombing, outside of southern suburbs
August 2, 2014	The Battle of Aarsal.
September 2014	Sporadic tension in Aarsal and Tripoli.
September 23	Tripoli.
October 2014	Tension mounts near Britel, eastern Lebanon.
Blue denotes one-day security incidents.	
Brown denotes multi-day security incidents.	

* Included in the preceding month.

Table A5: Unit Root Tests

	DF-GLS	PP
	Null: variable has uroot	Null: variable has uroot
<i>Y</i>	-2.292	-2.240
<i>y</i>	-9.502***	-9.742***
<i>RR</i>	-2.213	-1.540
<i>rr</i>	-8.088***	-7.970***
<i>RT</i>	-1.803	-1.925
<i>rt</i>	-7.654***	-7.550***
<i>R</i>	-2.266	-2.204
<i>r</i>	-6.963***	-7.178***
<i>S</i>	-3.958**	-3.924**
<i>s</i>	-10.431***	-13.837***
<i>F</i>	-7.088***	-7.562***
<i>f</i>	-12.487***	-41.986***
<i>K</i>	-3.531**	-3.708**
<i>k</i>	-9.640***	-35.845***
<i>P</i>	-6.397***	-6.518***
<i>p</i>	-8.856***	-38.800***
<i>MI</i>	-4.812***	-4.923***
<i>mi</i>	-9.572***	-12.531***
<i>MO</i>	-2.637	-6.858***
<i>mo</i>	-5.072***	-14.798***
<i>E</i>	-7.095***	-7.041***
<i>e</i>	-8.020***	-7.909***
*, **, *** denote rejection of the null hypothesis at the 10%, 5% and 1% significance levels, respectively.		

Table A6: VAR Residual Tests

		LM Test [†]		Jarque-Bera [‡]		White Test [‡]	
Null Hypothesis:		<i>No serial correlation</i>		<i>Normal</i>		<i>No heteroscedasticity</i>	
VAR	Lags	Stat	Prob	Stat	Prob.	Stat	Prob.
$V(s)$	12	7.573173	0.5777	6.555512	0.3639	N/A	N/A
$V(f)$	8	12.45965	0.1886	951.8785	0.0000***	317.2893	0.5007
$V(k)$	8	2.487434	0.9812	905.3675	0.0000***	306.1960	0.6727
$V(p)$	8	3.772604	0.9257	1225.813	0.0000***	317.8390	0.4920
$V(mi)$	7	5.138992	0.8220	594.0997	0.0000***	291.1613	0.3410
$V(mo)$	12	9.777249	0.3688	7.372872	0.2877	N/A	N/A
$V(e)$	13	8.939460	0.4429	2.898078	0.8215	N/A	N/A

[†] For each VAR estimated we only consider the LM-Stat and probability of the first lag.
[‡] We only consider the joint test and not each component individually.
*, **, *** denote rejection of the null hypothesis at the 10%, 5% and 1% significance levels, respectively.

Table A7: OLS Estimation for sDependent Variable: s

Method: Least Squares

Sample (adjusted): 2009M08 2013M12

Included observations: 53 after adjustments

Variable	Coefficient t	Std. Error	t-Statistic	Prob.
r	0.005013	0.020354	0.246268	0.8067
rr	0.004624	0.008446	0.547454	0.5870
rr_{t-1}	0.009116	0.008123	1.122276	0.2681
rr_{t-2}	0.016418	0.007887	2.081523	0.0435**
rr_{t-3}	-0.015736	0.007963	-1.976111	0.0547*
rr_{t-4}	0.003839	0.008239	0.465955	0.6437
rr_{t-5}	0.007333	0.008197	0.894626	0.3761
rr_{t-6}	-0.009869	0.007941	-1.242829	0.2208
rr_{t-7}	0.015605	0.007924	1.969337	0.0555*
y	1.841525	1.326859	1.387883	0.1725
r	-0.111103	0.052650	-2.110217	0.0408**
R-squared	0.324122	Mean dependent var		0.004329
Adjusted R-squared	0.163198	S.D. dependent var		0.134967
S.E. of regression	0.123464	Akaike info criterion		-1.163264
Sum squared resid	0.640220	Schwarz criterion		-0.754335
Log likelihood	41.82649	Hannan-Quinn criter.		-1.006010
F-statistic	2.014135	Durbin-Watson stat		2.500567
Prob(F-statistic)	0.056071			

*, **, *** denote rejection of the null hypothesis at the 10%, 5% and 1% significance levels, respectively.

Table A8: OLS Estimation for kDependent Variable: k

Method: Least Squares

Sample (adjusted): 2009M02 2014M06

Included observations: 65 after adjustments

Variable	Coefficient t	Std. Error	t-Statistic	Prob.
c	0.010409	0.010582	0.983633	0.3292
rr	-0.008304	0.005243	-1.583729	0.1184
y	1.547526	0.686817	2.253184	0.0279**
r	-0.021842	0.030731	-0.710765	0.4799
R-squared	0.145715	Mean dependent var		0.007942
Adjusted R-squared	0.103701	S.D. dependent var		0.082633
S.E. of regression	0.078231	Akaike info criterion		-2.198734
Sum squared resid	0.373327	Schwarz criterion		-2.064926
Log likelihood	75.45887	Hannan-Quinn criter.		-2.145938
F-statistic	3.468250	Durbin-Watson stat		2.534904
Prob(F-statistic)	0.021451			

*, **, *** denote rejection of the null hypothesis at the 10%, 5% and 1% significance levels, respectively.

Table A9: OLS Estimation for eDependent Variable: e

Method: Least Squares

Sample (adjusted): 2009M02 2014M06

Included observations: 65 after adjustments

Variable	Coefficient t	Std. Error	t-Statistic	Prob.
c	-0.231366	0.618074	-0.374334	0.7095
rr	-0.052518	0.306240	-0.171493	0.8644
y	70.48055	40.11403	1.757005	0.0839*
r	-0.332089	1.794841	-0.185024	0.8538
R-squared	0.053401	Mean dependent var		-0.143487
Adjusted R-squared	0.006847	S.D. dependent var		4.584866
S.E. of regression	4.569143	Akaike info criterion		5.936092
Sum squared resid	1273.501	Schwarz criterion		6.069900
Log likelihood	-188.9230	Hannan-Quinn criter.		5.988888
F-statistic	1.147075	Durbin-Watson stat		2.073171
Prob(F-statistic)	0.337368			

*, **, *** denote rejection of the null hypothesis at the 10%, 5% and 1% significance levels, respectively.

Figure A1: The evolution of BoP variables compared with the number of Syrian refugees.

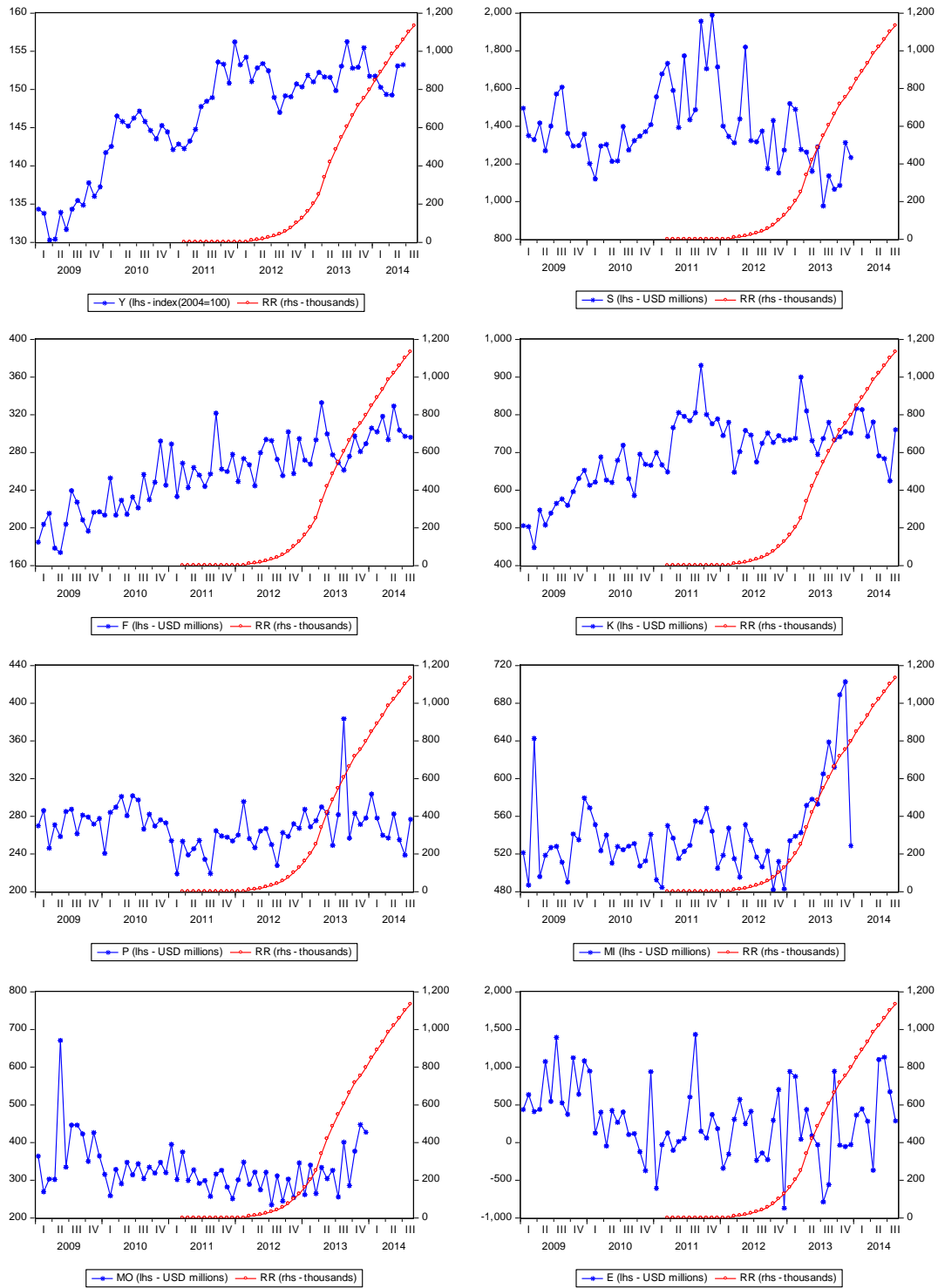


Figure A2: Impulse Response Functions for VAR $V(S)$

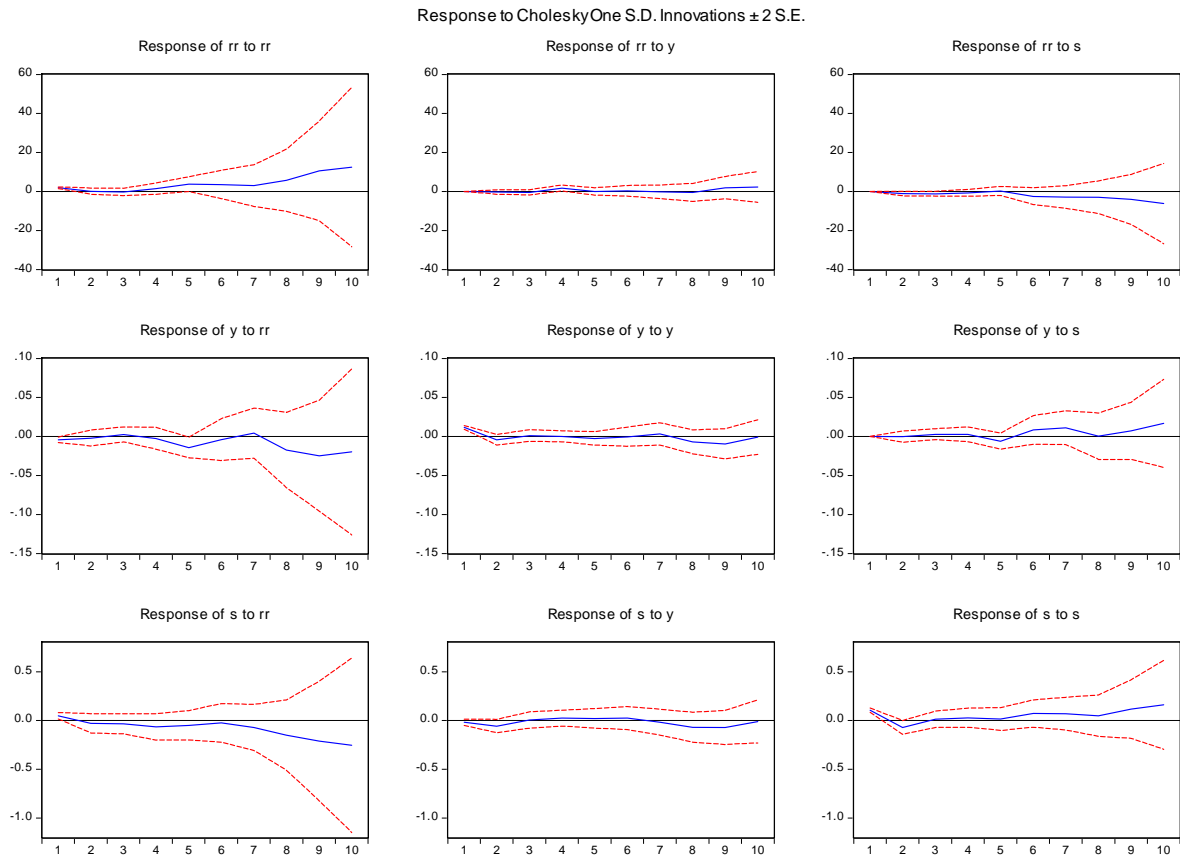


Figure A3: Impulse Response Functions for VAR $V(f)$

Response to CholeskyOne S.D. Innovations ± 2 S.E.

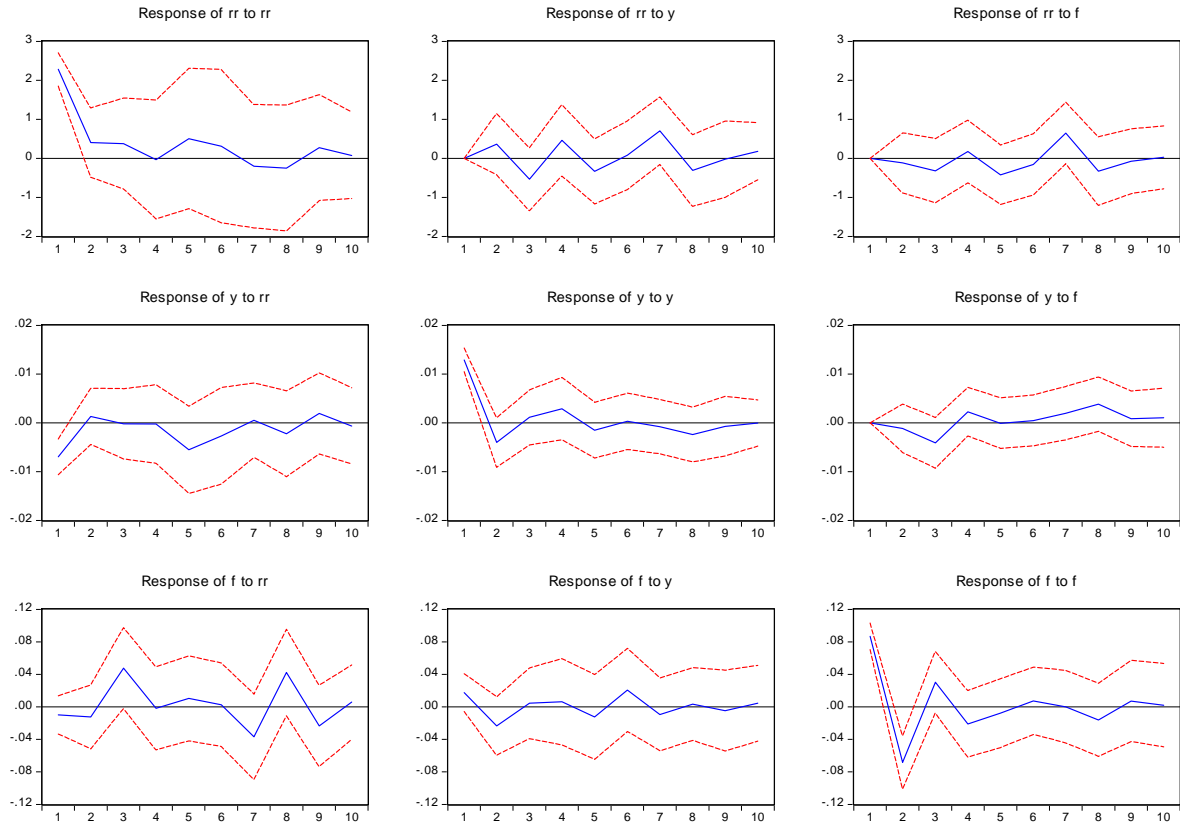


Figure A4: Impulse Response Functions for VAR $V(k)$

Response to Cholesky One S.D. Innovations ± 2 S.E.

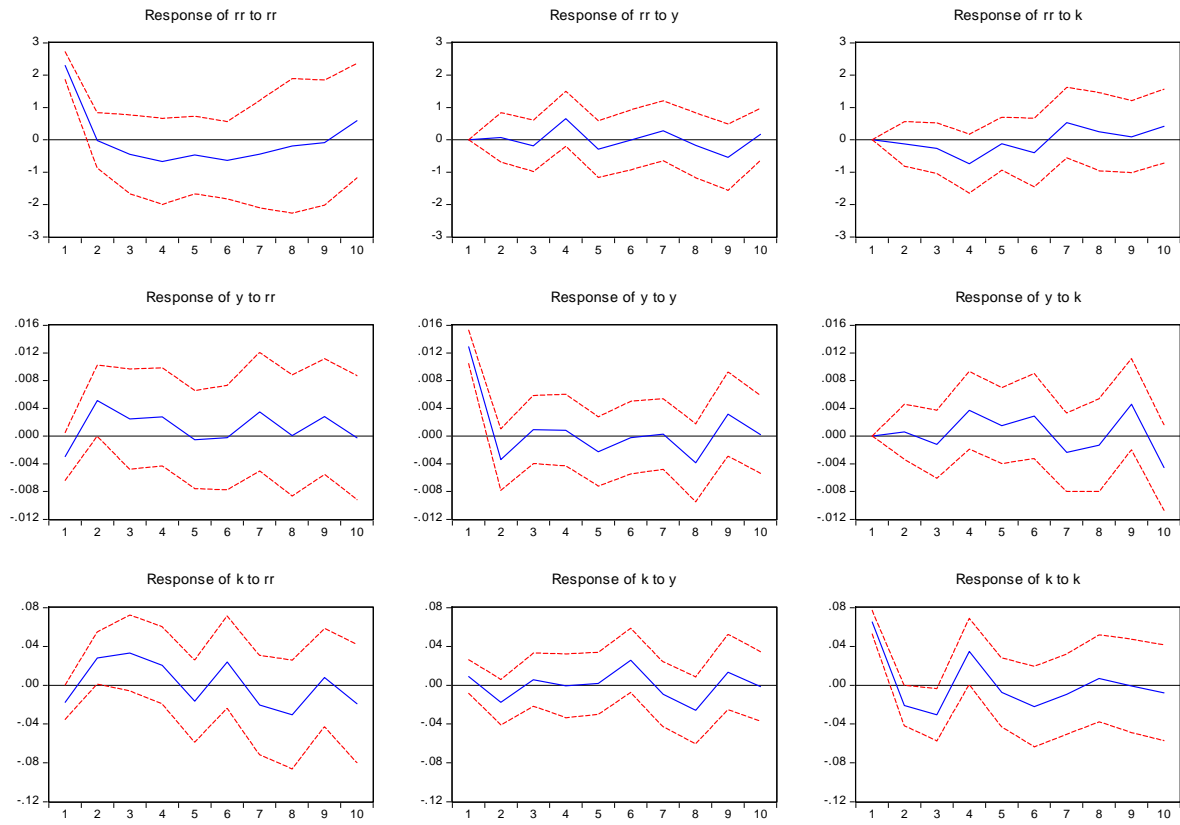


Figure A5: Impulse Response Functions for VAR $V(p)$

Response to CholeskyOne S.D. Innovations ± 2 S.E.

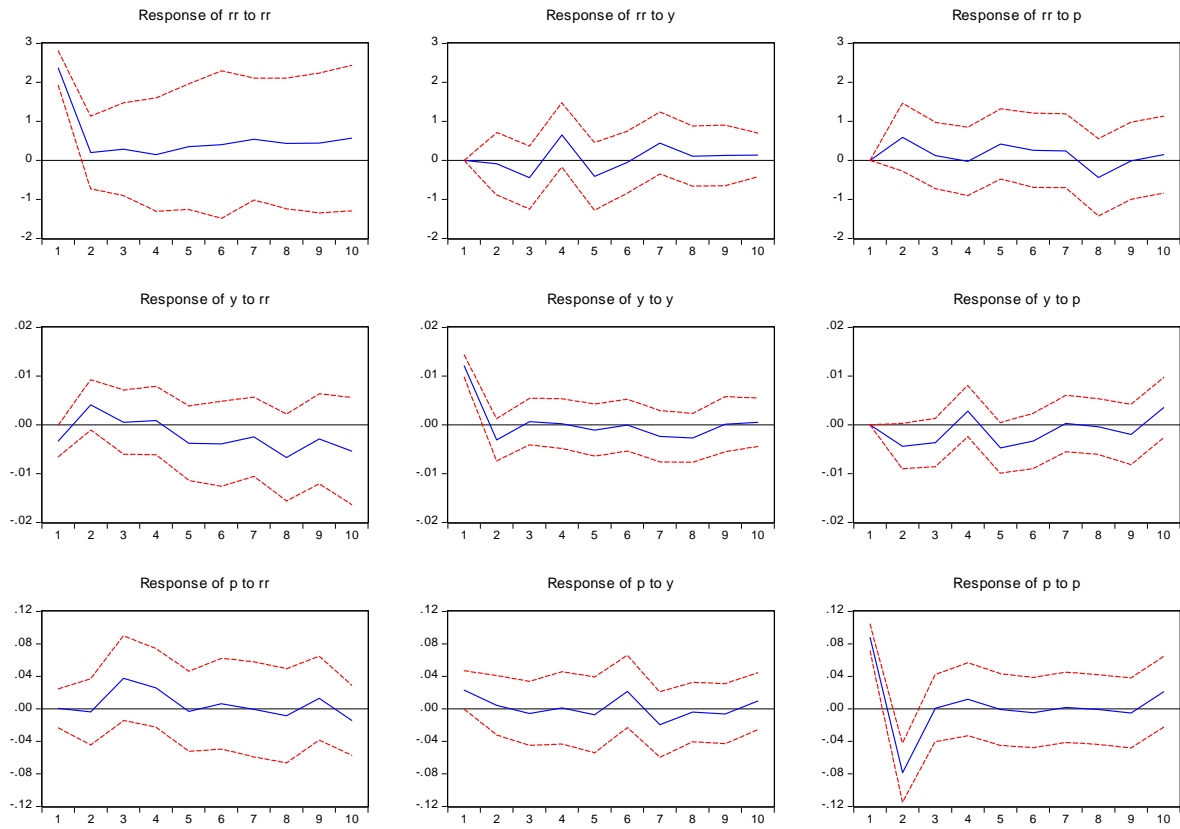


Figure A6: Impulse Response Functions for VAR $V(mi)$

Response to CholeskyOne S.D. Innovations ± 2 S.E.

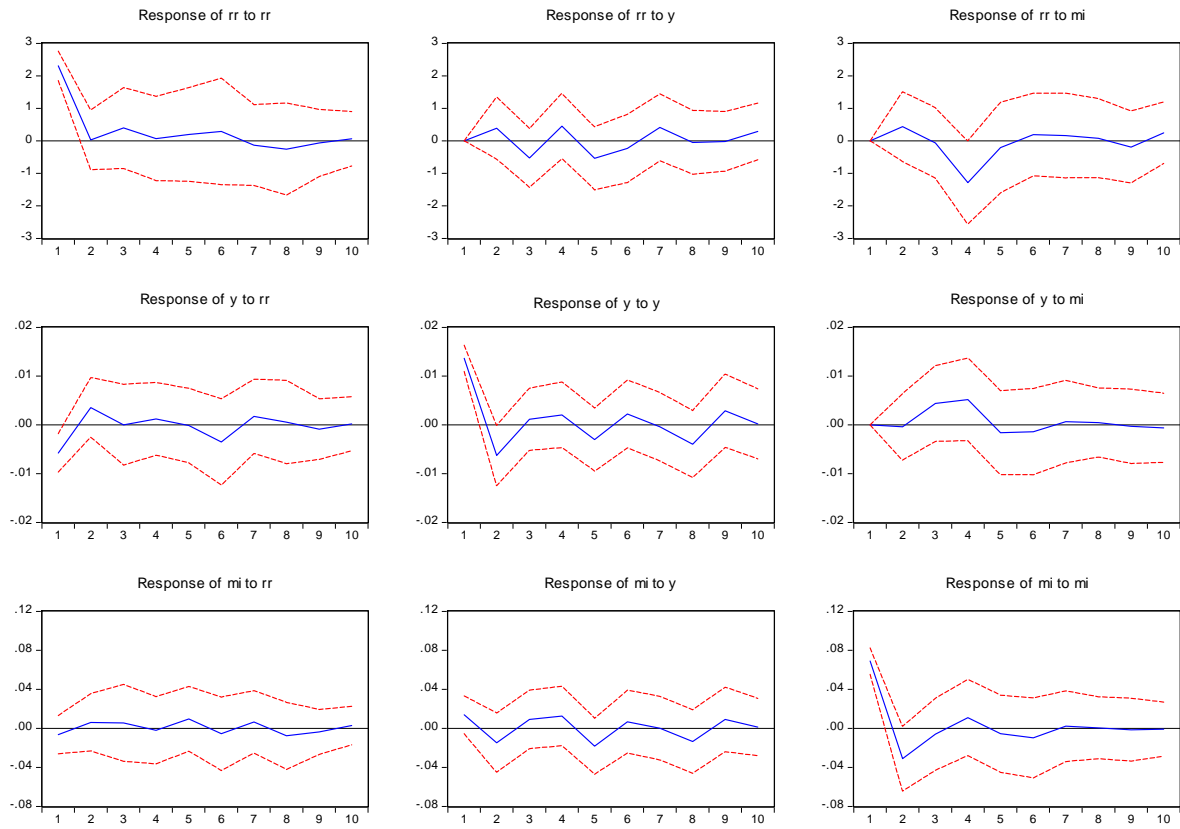


Figure A7: Impulse Response Functions for VAR $V(mo)$

Response to CholeskyOne S.D. Innovations ± 2 S.E.

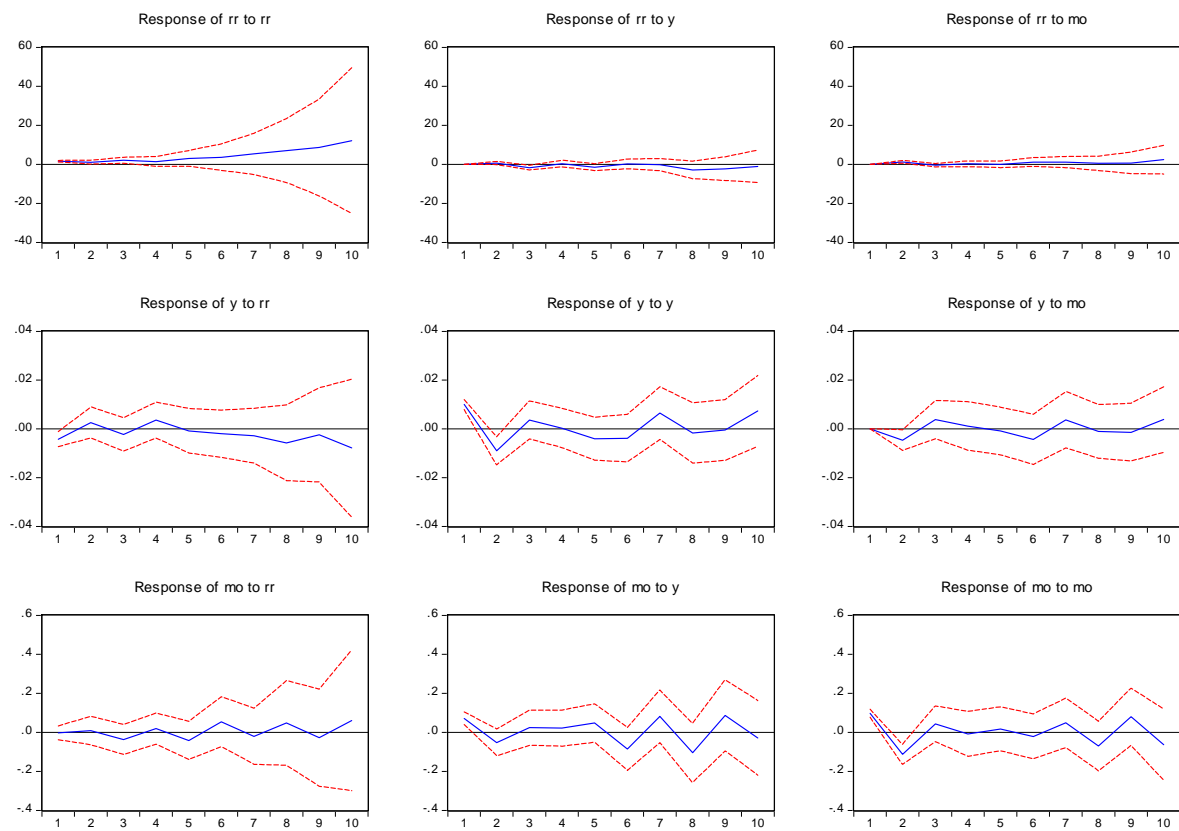


Figure A8: Impulse Response Functions for VAR $V(e)$

Response to CholeskyOne S.D. Innovations ± 2 S.E.

