

Online Annex 2. Fragile Foundations: The Lasting Economic Scars of Conflict

Annex 2.1. Data Description and Stylized Facts

Conflict Dataset

Our analysis uses the Uppsala Georeferenced Event Dataset (GED), Global version 23.1, as a data source for conflicts.¹ As highlighted in the *April 2019 Regional Economic Outlook: Sub-Saharan Africa*, this dataset has the advantage of providing comprehensive information on conflict-related deaths and covers the entire world.

The GED is a comprehensive dataset characterized by its detailed breakdown, offering insights into conflict-induced fatalities on an "event" basis. A conflict event refers to "an incident where armed force was used by an organized actor against another organized actor, or against civilians, resulting in at least 1 direct death at a specific location and a specific date." The dataset typically excludes criminal violence, such as homicides and gang-related violence, due to the challenges in conclusively linking these incidents to specific organized groups. It encompasses data regarding the death toll for each event, including the precise geographical coordinates (latitude and longitude) of the occurrences. Spanning from 1989 to 2017, the dataset encompasses information pertaining to every country globally.

The UCDP primarily gathers its data from international wire service reports and the British Broadcasting Corporation's (BBC) translations of local news. Efforts to mitigate any potential media biases in conflict reportage are bolstered by incorporating additional information from civil society reports and historical records. Should these sources overlook certain conflict events, it's possible that the resulting fatality figures might be underestimated. Nonetheless, these estimates are expected to closely mirror the actual numbers of conflict-related fatalities, as suggested by Sundberg and Melander (2013).

Using the GED and following *April 2019 Regional Economic Outlook: Sub-Saharan Africa*, we construct the following variables:

- Conflict-related deaths: In the majority of the analysis presented in this chapter, data from the event-level dataset is compiled at the national level to derive an annual total of conflict-related fatalities.
- Conflict intensity: To gauge the severity of conflicts, the ratio of conflict-related deaths to the population size is used. This approach, however, encounters challenges due to significant outliers, such as the 1994 genocide against the Tutsi in Rwanda, where approximately 8% of the nation's population was lost to conflict, potentially skewing regression analyses. To mitigate this, an alternative metric is crafted, drawing on the percentile rankings of conflict intensity within a global context (combined across nations and years) for use in regressions. According to this metric, the 25th, 50th, and 75th percentile values align with conflict-induced mortality rates of 0.68, 4, and 27 deaths per million individuals, respectively.
- Conflict type: Within the GED, conflicts are categorized by the nature of the actors involved. It identifies three primary types of conflicts: (i) state-based conflicts, involving clashes between two organized entities, with at least one being a government body; (ii) nonstate-based conflicts, featuring confrontations between two organized groups, with neither being a government; and (iii) one-sided events, where an organized group—either governmental or non-governmental—directly targets civilians.

Sample	125 countries where 23 from MENA, Afghanistan, and Pakistan, 6 from CCA, and 96 rest of the world.
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¹ See data at UCDP Dataset Download Center (uu.se).

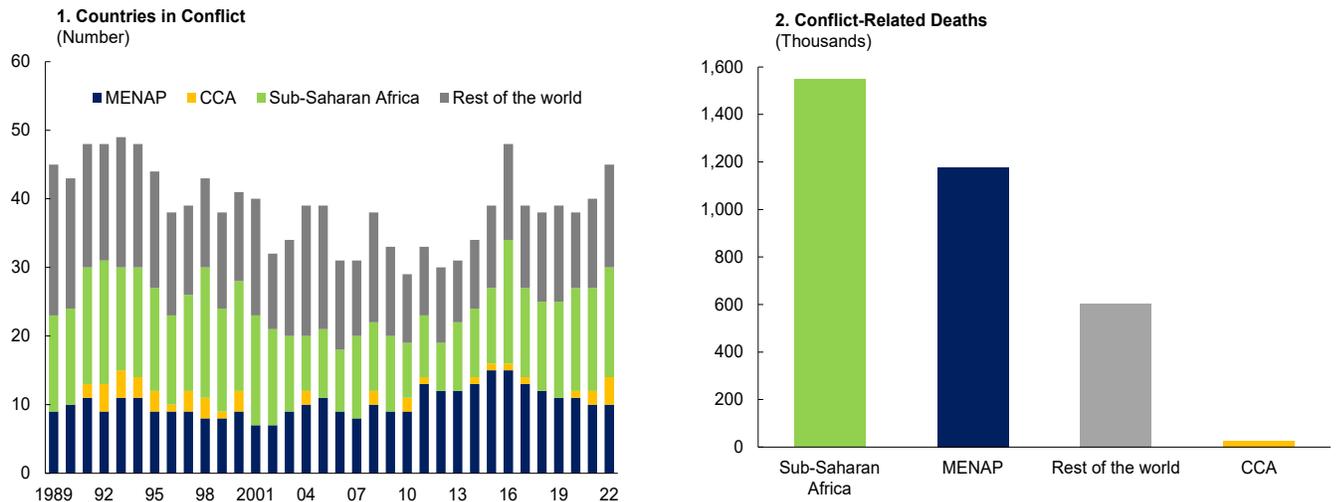
Number of conflicts	1,421 conflicts with more than 25 conflict-related deaths based on best estimate. 8020 conflicts by year and country (in panel dataset) of which 3587 have less than 25 conflict-related deaths, and 4433 of these conflicts have 25 or more conflict-related deaths.
Conflict-related deaths	3,357,346 conflict-related deaths based on best estimate (MENA, Afghanistan, and Pakistan – 1,169,465; CCA – 28,010; and rest of the world – 2,159,871 conflict-related deaths).

Other Variables

In the main text, Sections 2.2 and 2.3 use economic variables from the January 2024 World Economic Outlook. Refugee data comes from the United Nations High Commissioner for Refugees, institutional quality variables are extracted from the International Country Risk Guide and Worldwide Governance Indicators datasets, sovereign debt ratings are from Moody’s, trade related data is from the Centre d’Etudes Prospectives et d’Informations Internationales, and data on de facto exchange rate regimes from Ilizetzki, Reinhart, and Rogoff (2019).

Additional Stylized Facts

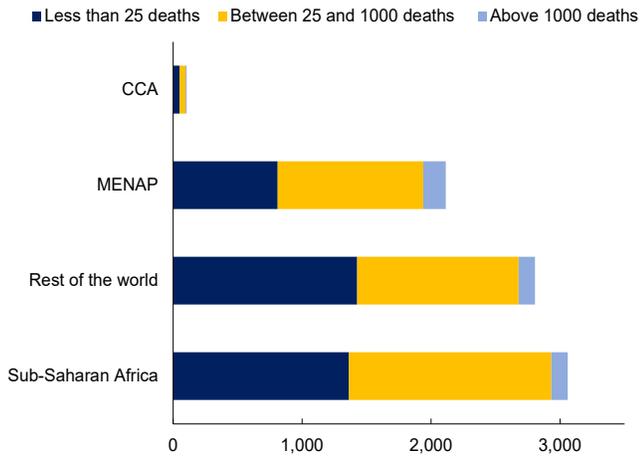
Annex Figure 2.1. Stylized Facts, 1989–2022



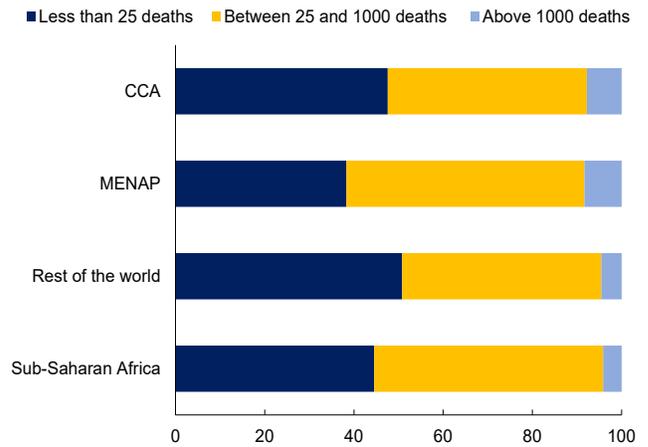
Sources: Uppsala Georeferenced Event Database (v23.1.); and IMF staff calculations.
Note: Country is in a conflict if it had at least 25 conflict-related confirmed deaths each year. CCA = Central Asia and Caucasus; MENAP = Middle East and North Africa, Afghanistan, and Pakistan.

Annex Figure 2.1. Stylized Facts, 1989–2022 (continued)

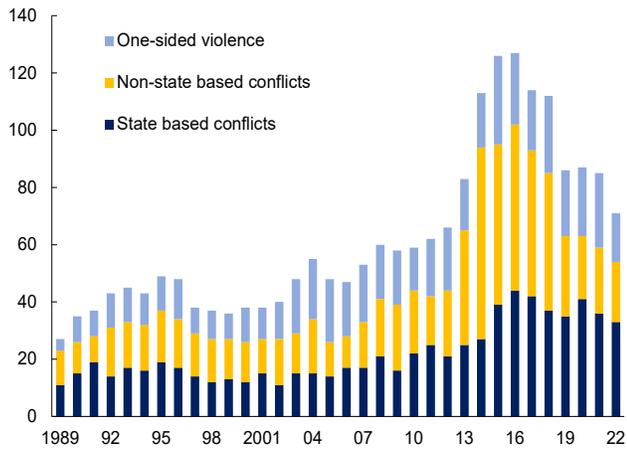
3. Conflicts by Intensity and Region
(Number of conflicts)



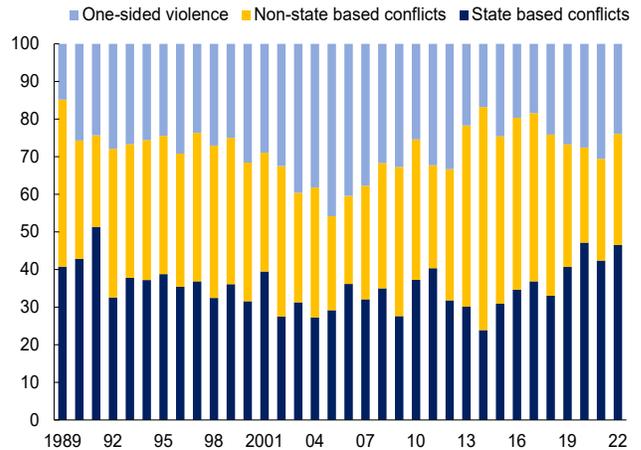
4. Conflicts by Intensity and Region
(Percent of total)



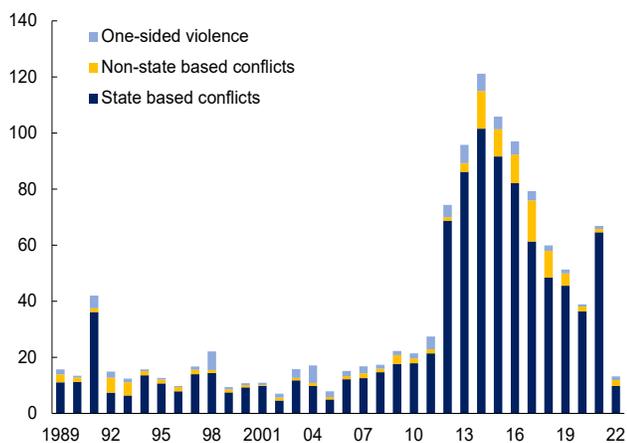
5. MENAP Region: Conflicts by Type
(Number)



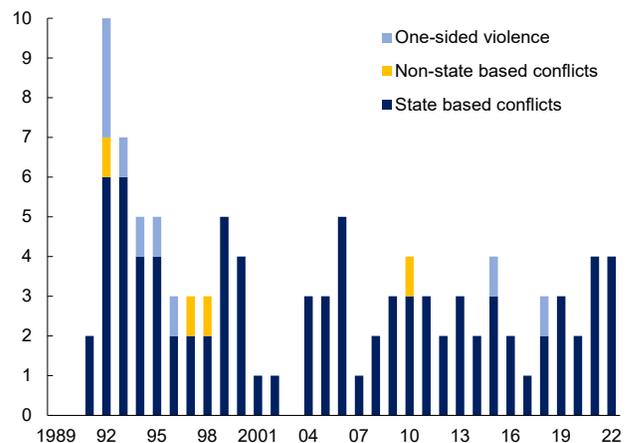
6. MENAP Region: Conflicts by Type
(Percent of total)



7. MENAP Region: Deaths by Type of Conflict
(Thousands)



8. CCA Region: Conflicts by Type
(Number)



Sources: Uppsala Georeferenced Event Database (v23.1.); and IMF staff calculations.

Note: Country is in a conflict if it had at least 25 conflict-related confirmed deaths each year. CCA = Central Asia and Caucasus; MENAP = Middle East and North Africa, Afghanistan, and Pakistan.

Annex 2.2. Baseline Model and Local Projection Results

Model and Estimation

We use the Jordà (2005) method of local projections and estimate dynamic responses by linear regressions of the following form:

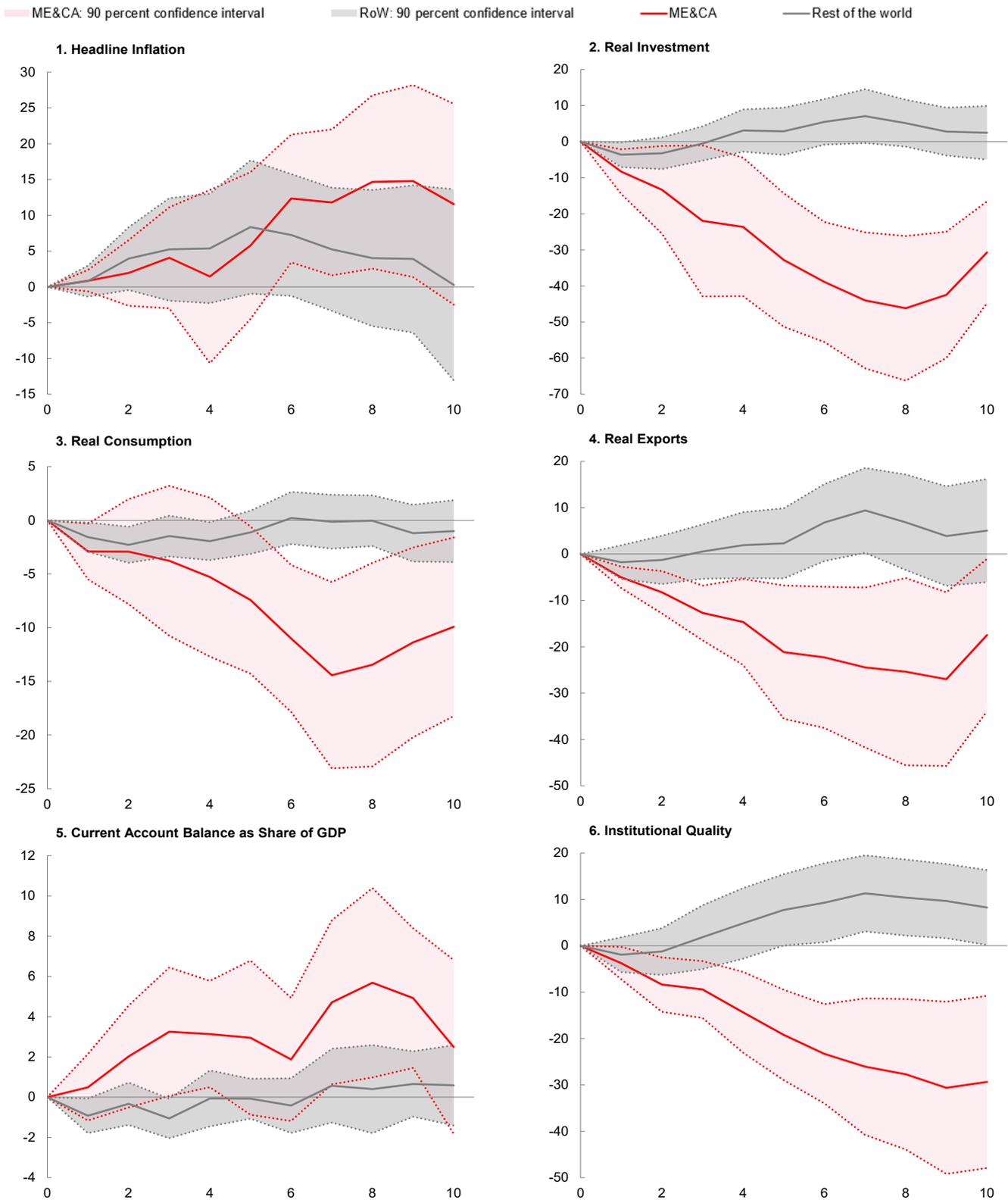
$$y_{i,t+h} - y_{i,t-1} = \beta_1^h C_{i,t} + \beta_2^h C_{i,t} * MECA_{dummy} y_i + \sum_{j=1}^l \beta_{3,j}^h C_{i,t-j} + \sum_{j=1}^l \gamma_{1,j}^h (y_{i,t-j} - y_{i,t-j-1}) + \sum_{j=1}^l \theta_j^h X_{i,t-j} + \alpha_i^h + \alpha_t^h + \epsilon_{i,t}^h$$

Where $y_{i,t}$ is log of per-capita GDP, $C_{i,t}$ is the conflict variable, $X_{i,t}^j$ is a set of control variables which include trade openness (log), terms of trade (pct change), export partners growth, investment/GDP, and h is the horizon for which the impulse response is to be computed. α_i^h and α_t^h are country and time fixed effects, respectively. Two lag of GDP growth and the conflict variable are included. Standard errors are clustered at the country level. All dependent variables used in the analysis are in constant terms, unless taken as share of GDP.

The coefficient β_1^h directly estimates the impulse response of per-capita GDP for horizon h in response to a shock to the conflict variable among all economies excluding ME&CA countries. The coefficient β_2^h estimates the differential impulse response of per-capita GDP for horizon h in response to a shock to the conflict variable among ME&CA countries. Our average impulse response for ME&CA countries is the sum of β_1^h and β_2^h .

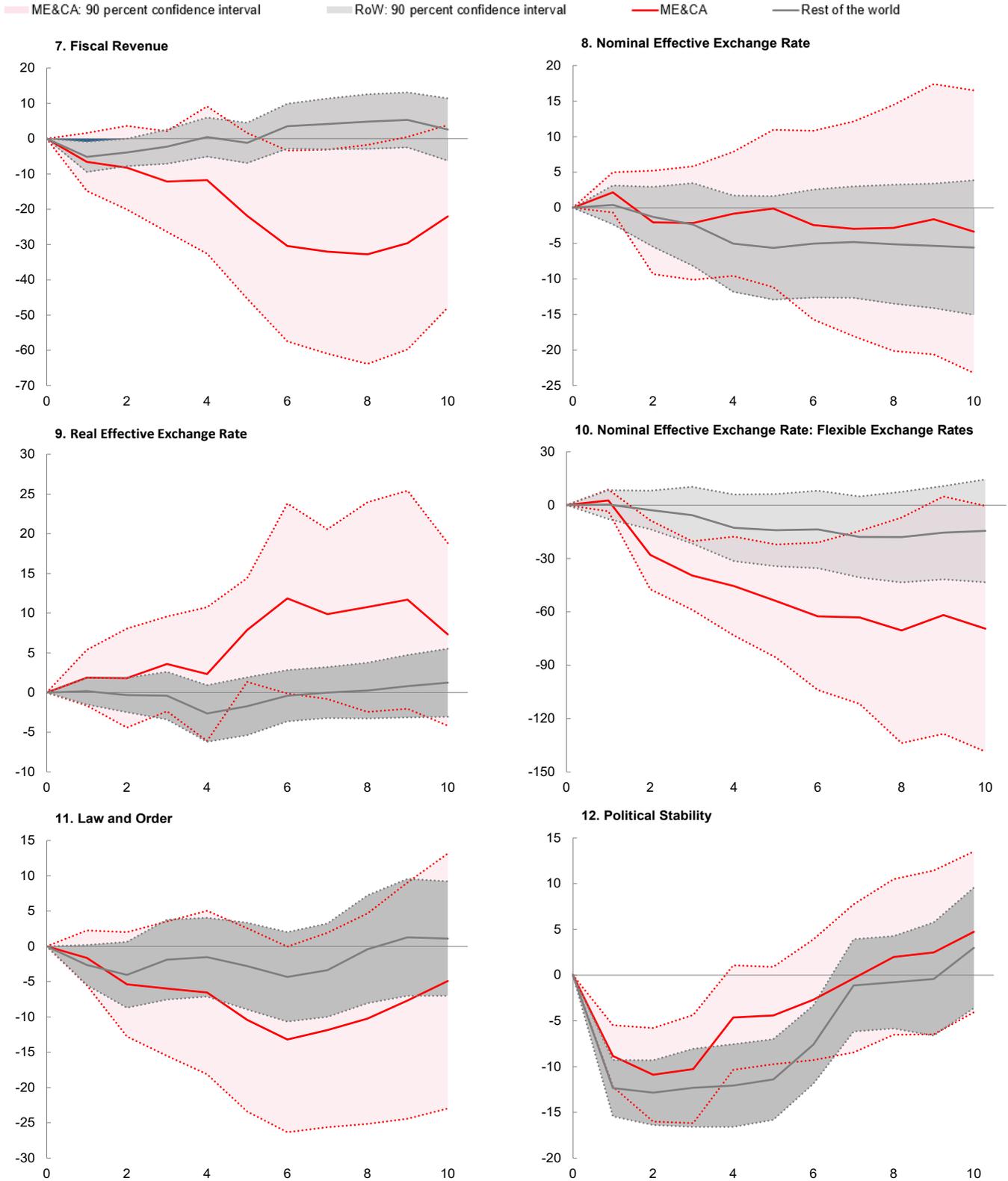
Local Projection Results on Additional Economic Variables

Annex Figure 2.2. Impact of Conflicts on the Macroeconomy



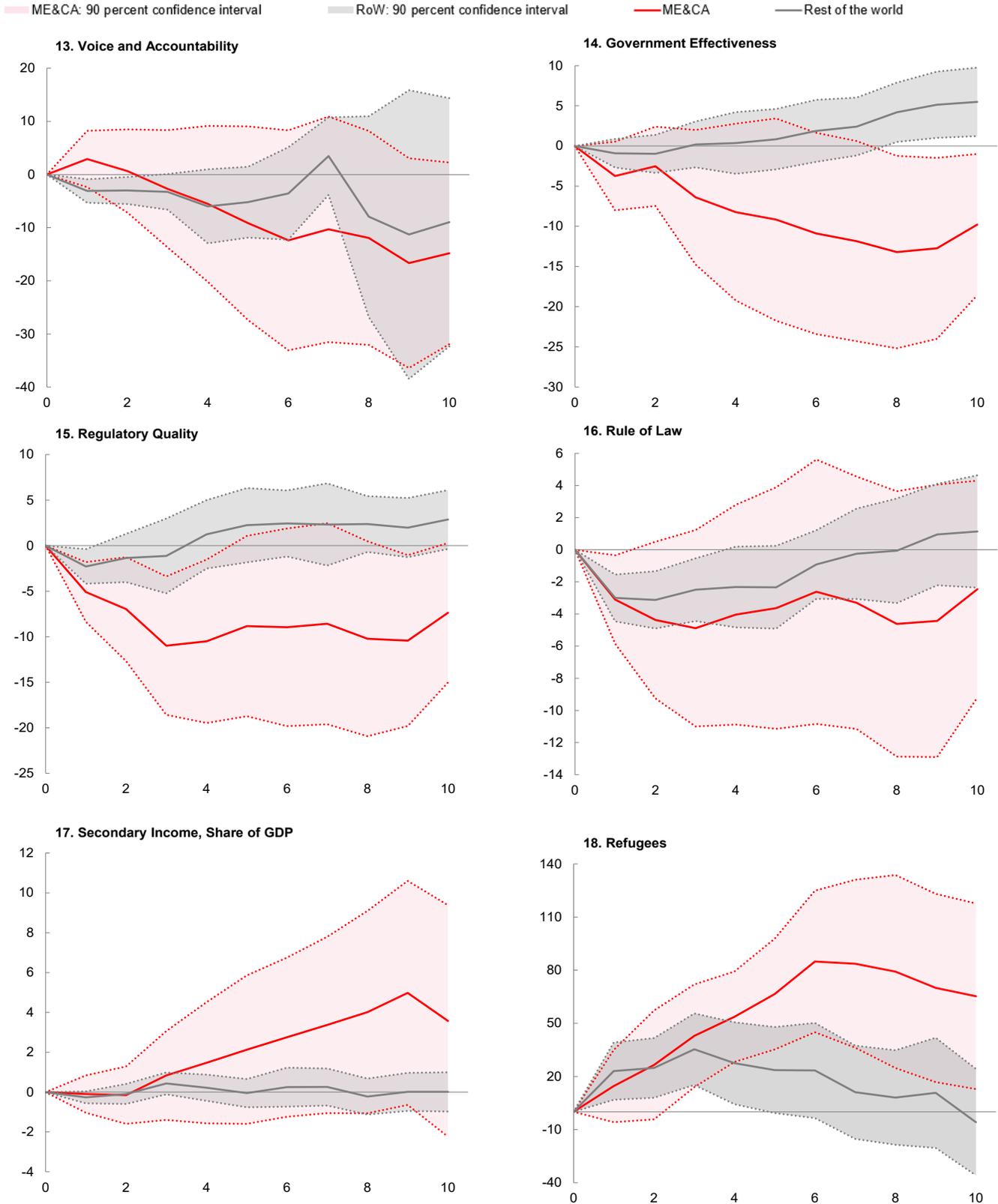
Sources: IMF, World Economic Outlook database; International Country Risk Guide (ICRG); Ilzetzki and others (2019); World Bank, Worldwide Governance Indicators; United Nations Refugee Agency (UNHCR); Uppsala Georeferenced Event Database (v23.1.); and IMF staff calculations. Note: The shock occurs in year 1 and corresponds to an increase in conflict intensity to the 75th percentile of the world distribution. ME&CA = Middle East and Central Asia.

Annex Figure 2.2. Impact of Conflicts on the Macroeconomy (continued)



Sources: IMF, World Economic Outlook database; International Country Risk Guide (ICRG); Ilzetzi and others (2019); World Bank, Worldwide Governance Indicators; United Nations Refugee Agency (UNHCR); Uppsala Georeferenced Event Database (v23.1.); and IMF staff calculations. Note: The shock occurs in year 1 and corresponds to an increase in conflict intensity to the 75th percentile of the world distribution. ME&CA = Middle East and Central Asia.

Annex Figure 2.2. Impact of Conflicts on the Macroeconomy (continued)



Sources: IMF, World Economic Outlook database; International Country Risk Guide (ICRG); Ilzetzki and others (2019); World Bank, Worldwide Governance Indicators; United Nations Refugee Agency (UNHCR); Uppsala Georeferenced Event Database (v23.1.); and IMF staff calculations. Note: The shock occurs in year 1 and corresponds to an increase in conflict intensity to the 75th percentile of the world distribution. ME&CA = Middle East and Central Asia.

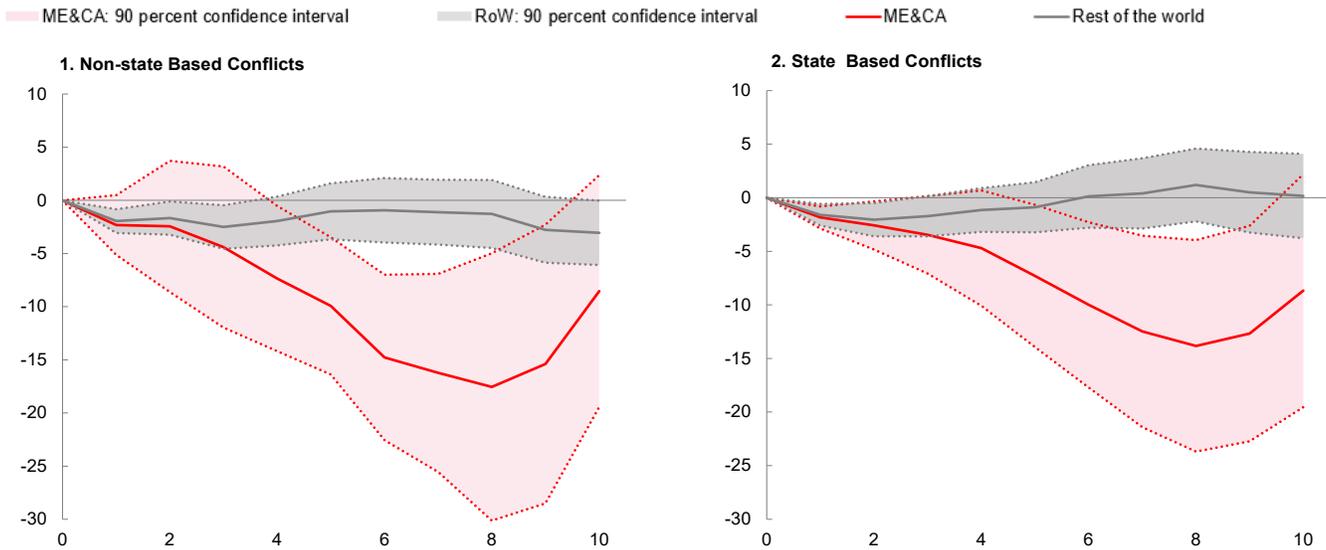
Annex 2.3. Model and Local Projection Results by Type of Conflict

In the following analysis, we include all types of conflict variables at the same time and compute impulse responses according to the type of conflict. We adapt the specification from Annex 2.2 using the following:

$$y_{i,t+h} - y_{i,t-1} = \sum_{k=1}^3 \beta_{1,l}^h C_{i,t,k} + \sum_{k=1}^3 \beta_{2,l}^h C_{i,t,k} * MECAdummy_i + \beta_2^h C_{i,t} * MECAdummy_i + \sum_{j=1}^l \beta_{3,j}^h C_{i,t-j} + \sum_{j=1}^l \gamma_{1,j}^h (y_{i,t-j} - y_{i,t-j-1}) + \sum_{j=1}^l \theta_j^h X_{i,t-j} + \alpha_i^h + \alpha_t^h + \epsilon_{i,t}^h$$

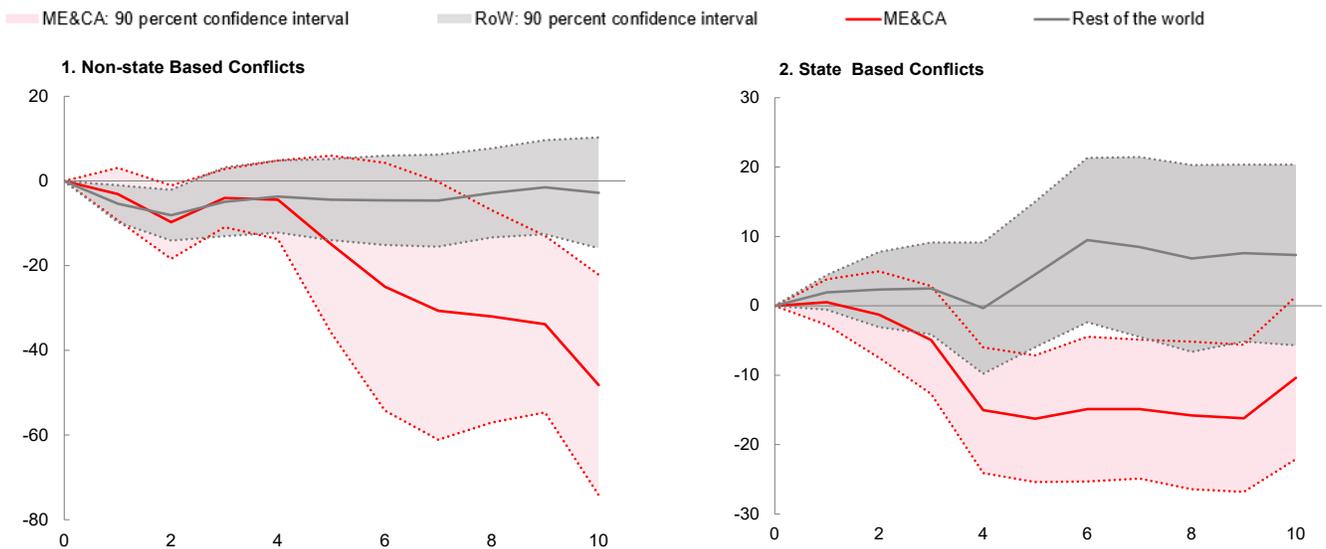
Where $C_{i,t,k}$ is the percentile of deaths to population ratio for either non-state-based conflicts, state-based conflicts, or one-sided conflicts.

Annex Figure 2.3.1. Impact of Conflict Types on Real GDP per Capita (Percent)



Sources: IMF, World Economic Outlook database; Uppsala Georeferenced Event Database (v23.1.); and IMF staff calculations.
 Note: The shock occurs in year 1 and corresponds to an increase in conflict intensity to the 75th percentile of the world distribution.

Annex Figure 2.3.2. Impact of Conflict Types on Institutional Quality (Percent)



Sources: IMF, World Economic Outlook database; Uppsala Georeferenced Event Database (v23.1.); and IMF staff calculations.
 Note: The shock occurs in year 1 and corresponds to an increase in conflict intensity to the 75th percentile of the world distribution. Two lags shocks and real GDP per capita growth. ME&CA = Middle East and Central Asia.

Annex 2.4. Models and Local Projection Results – Heterogeneous Impacts

We use the following specification in Annex Figure 2.4.1:

$$y_{i,t+h} - y_{i,t-1} = \sum_{k=0}^4 \beta_{1,k}^h \text{ConflictQuartile}_{i,t,k} + \sum_{k=0}^4 \beta_{2,k}^h \text{ConflictQuartile}_{i,t,k} * \text{MECADummy}_i + \\ + \sum_{k=0}^4 \sum_{j=1}^l \beta_{3,k,j}^h \text{ConflictQuartile}_{i,t-j,k} + \sum_{j=1}^l \gamma_{1,j}^h (y_{i,t-j} - y_{i,t-j-1}) + \sum_{j=1}^l \theta_j^h X_{i,t-j}^j + \alpha_i^h + \alpha_t^h + \epsilon_{i,t}^h$$

Where *ConflictQuartile* is a categorical variable from 0 to 4, where k=1 is a low intensity conflict and k=4 is a high intensity conflict. The sum of coefficients $\beta_{1,1}^h$ and $\beta_{2,1}^h$ estimates the impulse response of per-capita GDP for horizon h in response to a low intensity conflict among ME&CA countries. The sum of coefficients $\beta_{1,4}^h$ and $\beta_{2,4}^h$ estimates the impulse response of per-capita GDP for horizon h in response to a high intensity conflict among ME&CA countries.

We use the following specification in Annex Figure 2.4.2:

$$y_{i,t+h} - y_{i,t-1} = \beta_1^h C_{i,t} + \beta_2^h C_{i,t} * \text{MECADummy}_i + \beta_3^h C_{i,t} * \text{HighDurationDummy}_{i,t} + \beta_4^h \text{MECADummy}_i * \\ \text{HighDurationDummy}_{i,t} + \beta_5^h C_{i,t} * \text{MECADummy}_i * \text{HighDurationDummy}_{i,t} + \sum_{j=1}^l \beta_{6,j}^h C_{i,t-j} + \\ \sum_{j=1}^l \gamma_{1,j}^h (y_{i,t-j} - y_{i,t-j-1}) + \sum_{j=1}^l \theta_j^h X_{i,t-j} + \alpha_i^h + \alpha_t^h + \text{HighDurationDummy}_{i,t} + \epsilon_{i,t}^h$$

The sum of β_1^h , β_2^h , β_3^h and β_5^h estimates the differential impulse response of per-capita GDP for horizon h in response to a shock to the conflict variable among ME&CA countries that experience a high duration conflict. Our average impulse response for other ME&CA countries is the sum of β_1^h and β_2^h .

We use the following specification in Annex Figure 2.4.3 to 2.4.5:

$$y_{i,t+h} - y_{i,t-1} = \beta_1^h C_{i,t} + \beta_2^h C_{i,t} * \text{MECADummy}_i + \beta_3^h C_{i,t} * \text{PreConflictCharacteristicDummy}_{i,t} + \beta_4^h \text{MECADummy}_i * \\ \text{PreConflictCharacteristicDummy}_{i,t} + \beta_5^h C_{i,t} * \text{MECADummy}_i * \text{PreConflictCharacteristicDummy}_{i,t} + \\ \sum_{j=1}^l \beta_{6,j}^h C_{i,t-j} + \sum_{j=1}^l \gamma_{1,j}^h (y_{i,t-j} - y_{i,t-j-1}) + \sum_{j=1}^l \theta_j^h X_{i,t-j} + \alpha_i^h + \alpha_t^h + \text{PreConflictCharacteristicDummy}_{i,t} + \epsilon_{i,t}^h$$

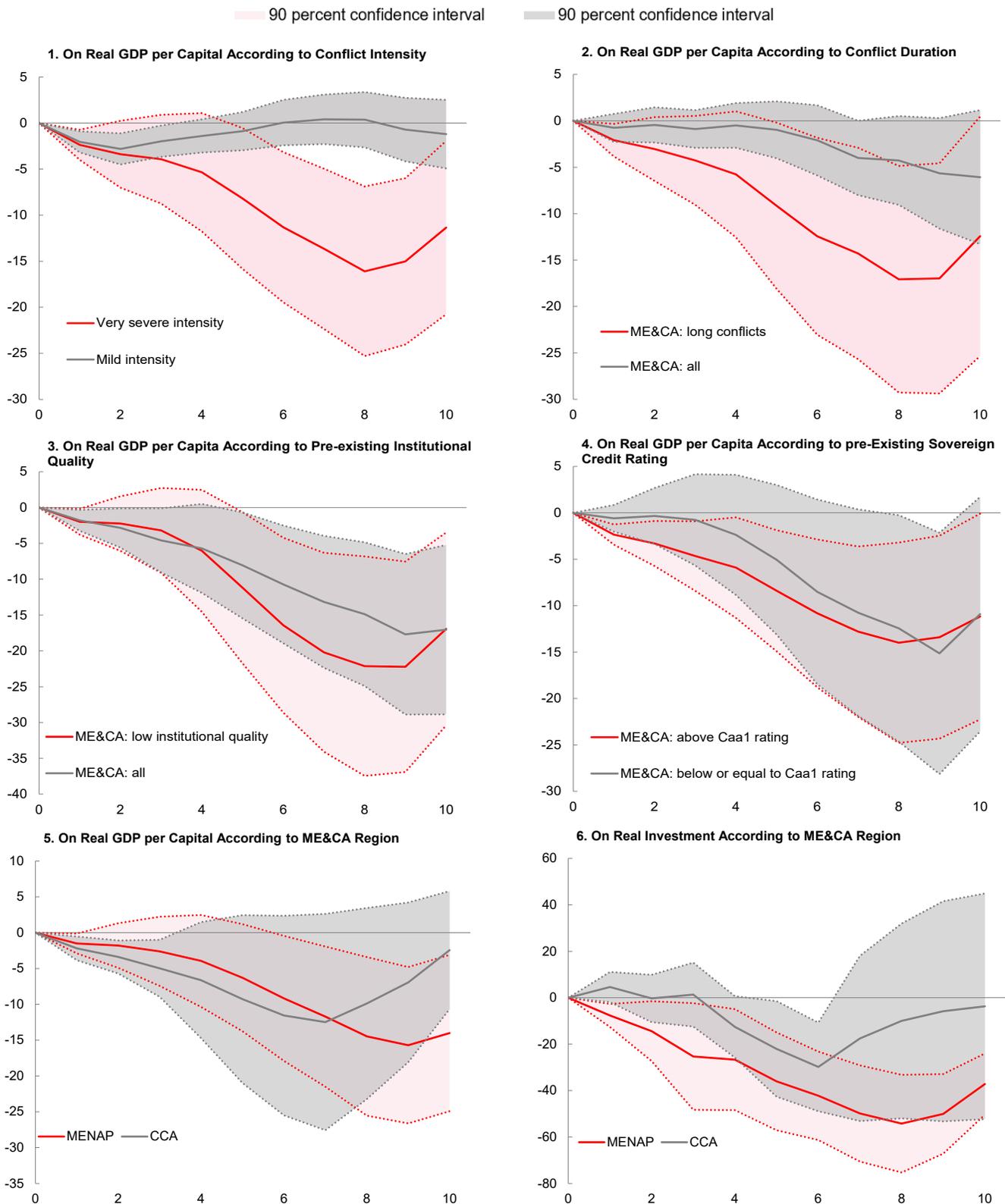
The sum of β_1^h , β_2^h , β_3^h and β_5^h estimates the differential impulse response of per-capita GDP for horizon h in response to a shock to the conflict variable among ME&CA countries with the specific pre-conflict characteristic of interest. Our average impulse response for other ME&CA countries is the sum of β_1^h and β_2^h .

We use the following specification in Annex Figures 2.4.6 to 2.4.8:

$$y_{i,t+h} - y_{i,t-1} = \beta_1^h C_{i,t} + \beta_2^h C_{i,t} * \text{MENAPdummy}_i + \beta_3^h C_{i,t} * \text{CCADummy}_i + \sum_{j=1}^l \beta_{4,j}^h C_{i,t-j} + \sum_{j=1}^l \gamma_{1,j}^h (y_{i,t-j} - y_{i,t-j-1}) + \\ \sum_{j=1}^l \theta_j^h X_{i,t-j} + \alpha_i^h + \alpha_t^h + \epsilon_{i,t}^h$$

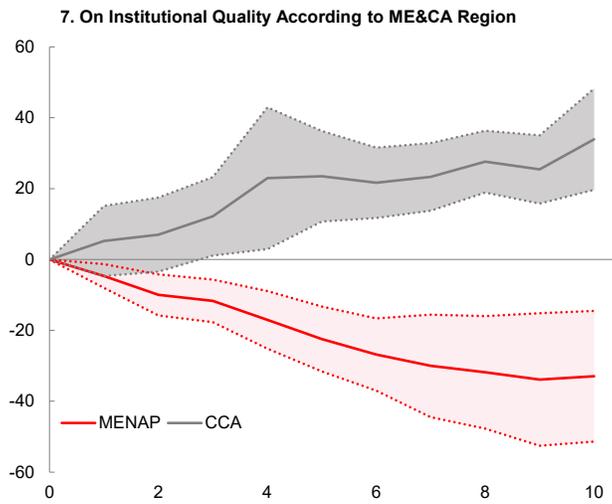
The sum of coefficients β_1^h and β_2^h estimates the impulse response of per-capita GDP for horizon h in response to an increase in conflict intensity among MENAP countries. The sum of coefficients β_1^h and β_3^h estimates the impulse response of per-capita GDP for horizon h in response to an increase in conflict intensity among CCA countries.

Annex Figure 2.4. Differential Impact of Conflicts (Percent)



Sources: IMF, World Economic Outlook database; Bloomberg Finance L.P.; International Country Risk Guide (ICRG); Ilzetzki and others (2019); World Bank, Worldwide Governance Indicators; Uppsala Georeferenced Event Database (v23.1.); and IMF staff calculations.
 Note: The shock occurs in year 1 and corresponds to an increase in conflict intensity to the 75th percentile of the world distribution. ME&CA = Middle East and Central Asia.

Annex Figure 2.4. Differential Impact of Conflicts (continued)
(Percent)



Sources: IMF, World Economic Outlook database; Bloomberg Finance L.P.; Uppsala Georeferenced Event Database (v23.1.); International Country Risk Guide (ICRG); Ilzetzki and others (2019); World Bank, Worldwide Governance Indicators; and IMF staff calculations.
 Note: The shock occurs in year 1 and corresponds to an increase in conflict intensity to the 75th percentile of the world distribution.

Annex 2.5. Local Projection Results – Robustness Tests

Our results could be driven by baseline dynamics as an important share of our sample is often affected by conflicts. To that effect we run two robustness checks.

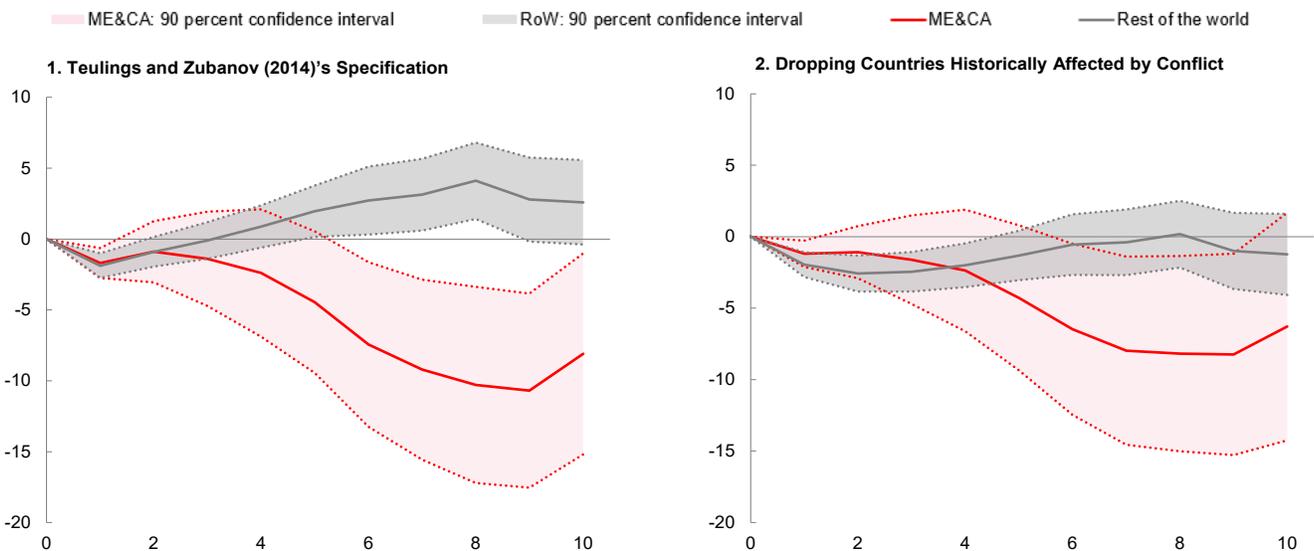
- 1- We follow Teulings and Zubanov (2014) and control for contemporaneous shocks over the horizon. This enables us to control for future shocks and anticipation effects generated by the start of a conflict. Our specification has to following form:

$$y_{i,t+h} - y_{i,t-1} = \beta_1^h C_{i,t} + \beta_2^h C_{i,t} * MECA_{dummy_i} + \sum_{j=0}^h \beta_{3,j}^h C_{i,t-j-1} + \sum_{j=1}^l \gamma_{1,j}^h (y_{i,t-j} - y_{i,t-j-1}) + \sum_{j=1}^l \theta_j^h X_{i,t-j} + \alpha_i^h + \alpha_t^h + \epsilon_{i,t}^h$$

Annex Figure 2.5.1 shows that our results remain robust to the addition of the conflict variable between periods t and $t+h$.

- 2- We drop countries that have historically been conflict-affected. In particular, we run the same regression as in Annex 2.2 after dropping Afghanistan, Syria, Iraq, Libya, Yemen, West Bank and Gaza, Sudan, and Somalia. Annex Figure 2.5.2 shows that our results remain robust to excluding this set of countries. We nevertheless obtain a smaller point estimate (in absolute value), consistent with some non-linearities according to conflict intensity.

Annex Figure 2.5. Impact of Conflicts on Real GDP per Capita (Percent)



Sources: IMF, World Economic Outlook database; Uppsala Georeferenced Event Database (v23.1.); and IMF staff calculations.

Note: The shock occurs in year 1 and corresponds to an increase in conflict intensity to the 75th percentile of the world distribution. ME&CA = Middle East and Central Asia.

Annex 2.6. Econometric Analysis of Conflict Spillovers

Model and Estimation

We define countries impacted by spillovers in the following manner:

1. A neighboring country shares a border with the country in conflict at any point in time.
 $Border_{i,j} = 1$ if i and j share a border.

Then, the dummy for trading partners or bordering countries is later interacted with the conflict measure in the adjacent country, which is conflict related deaths. The source for the data on contiguity is CEPIL gravity data.

2. Trading partner is a country that has a trade agreement with another country in conflict.

$$\text{Trade}_{i,j,t} = 1 \text{ if } i \text{ and } j \text{ share a foreign trade agreement at any point in time.}$$

Data on the trade agreement is taken from the CEPII database which uses the raw bilateral measures from WTO.² The average country has bilateral trade agreements with about 22 percent of their trading partners and trade-agreement associated trade accounts for about 44 percent of a country's total trade on average, in recent years (in other words it is more likely to trade more intensely with countries with which there is a trade agreement and it is quantitatively important).

The spillover shock is then constructed as follows:

$$\text{Spillover}_{\text{shock}_{i,t}} = \frac{(\sum_j W_{i,j,t} * \text{deaths}_{j,t})}{(\sum_j W_{i,j,t} * \text{population}_{j,t})}$$

where . To be consistent with the own-conflict analysis, we use the percentile equivalence of the $\text{Spillover}_{\text{shock}_{i,t}}$

Similarly, we use local projections a la Jordà (2005) and estimate the following augmented impulse response function regressions:

$$y_{i,t+h} - y_{i,t-1} = \beta_0^h S_{i,t} + \beta_1^h S_{i,t} * \text{MECA}_{\text{dummy}_i} + \sum_{j=1}^l \beta_2^h S_{i,t-j} + \sum_{j=0}^l \beta_3^h C_{i,t-j} + \sum_{j=1}^l \gamma_{1,j}^h (y_{i,t-j} - y_{i,t-j-1}) + \sum_{j=1}^l \theta_j^h X_{i,t-j}^j + \alpha_i^h + \alpha_t^h + \epsilon_{i,t}^h$$

Where $y_{i,t}$ is log of per-capita GDP, $S_{i,t}$ is the spillover shock, $C_{i,t}$ is the own conflict variable used in the own conflict analysis and as described in section A2.1, $X_{i,t}^j$ is other control variables which include trade openness (log), terms of trade (pct change), export partners growth, investment/GDP, lagged number of refugees, and h is the horizon for which the impulse response is to be computed. α_i^h and α_t^h are country and time fixed effects, respectively. Two lag of GDP growth and the spillover and own conflict variable are included. Standard errors are clustered at the country level. The coefficient β_0^h directly estimates the impulse response of per-capita GDP for horizon h in response to the spillover shock among all economies excluding ME&CA countries. The coefficient β_1^h estimates the differential impulse response of per-capita GDP for horizon h in response to the spillover shock variable among ME&CA countries. Our average impulse response for ME&CA countries is the sum of β_0^h and β_1^h .

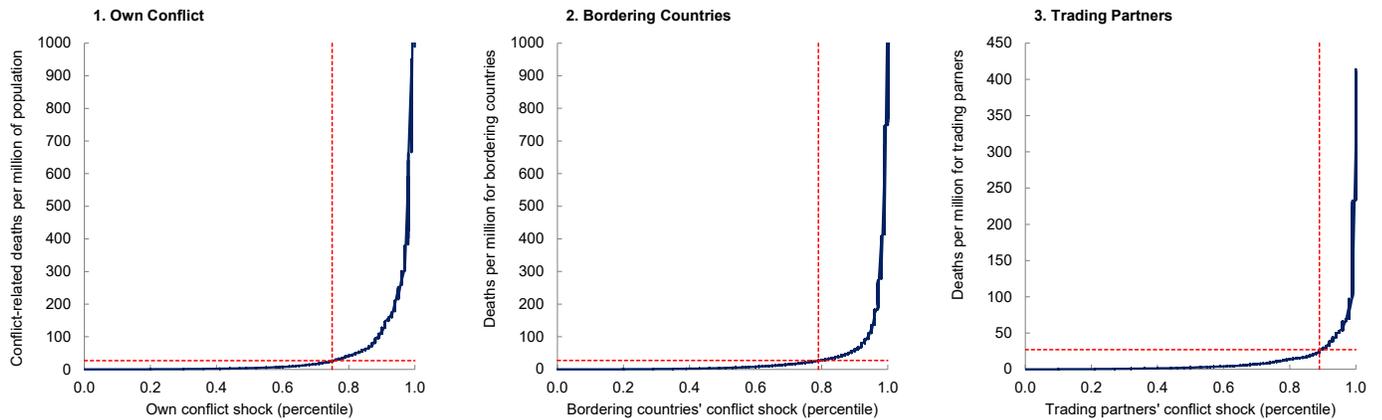
To estimate the heterogeneous impact based on institutional characteristics, we estimate the following local projection regression:

$$y_{i,t+h} - y_{i,t-1} = \beta_1^h S_{i,t} + \beta_2^h S_{i,t} * \text{MECA}_{\text{dummy}_i} + \beta_3^h S_{i,t} * \text{Institutional}_{\text{Quality}} + \beta_4^h \text{MECA}_{\text{dummy}_i} * \text{Institutional}_{\text{Quality}} + \beta_5^h S_{i,t} * \text{MECA}_{\text{dummy}_i} * \text{Institutional}_{\text{Quality}} + \sum_{j=1}^l \beta_{6,j}^h S_{i,t-j} + \sum_{j=1}^l \gamma_{1,j}^h (y_{i,t-j} - y_{i,t-j-1}) + \sum_{j=1}^l \theta_j^h X_{i,t-j}^j + \alpha_i^h + \alpha_t^h + \epsilon_{i,t}^h$$

The sum of β_1^h , β_2^h , β_3^h and β_5^h estimates the differential impulse response of per-capita GDP for horizon h in response to a shock to the conflict variable among ME&CA countries with the specific institutional quality measure. Our average impulse response for other ME&CA countries is the sum of β_1^h and β_2^h . Institutional quality is the lagged measure of the variable and low institutional quality is defined as having less than the median of the world distribution.

We then map the own conflict shock to the spillover shock to ensure consistency of interpretation. Our approach links the percentile change in the own conflict shock to what that implies in terms of deaths per million, and we then map the latter to the spillover percentile. An own conflict shock at the 0.75 percentile corresponds to approximately 27 deaths per million in own country. For that same ratio of deaths per million in neighboring countries or trading partners, this corresponds to a 0.79 percentile of the spillover shock for bordering states and 0.89 for trade partners. So, estimates in spillover are scaled accordingly.

Annex Figure 2.6.1. Mapping Conflict-related Deaths per Million of Population to the Percentile Equivalence of the shocks

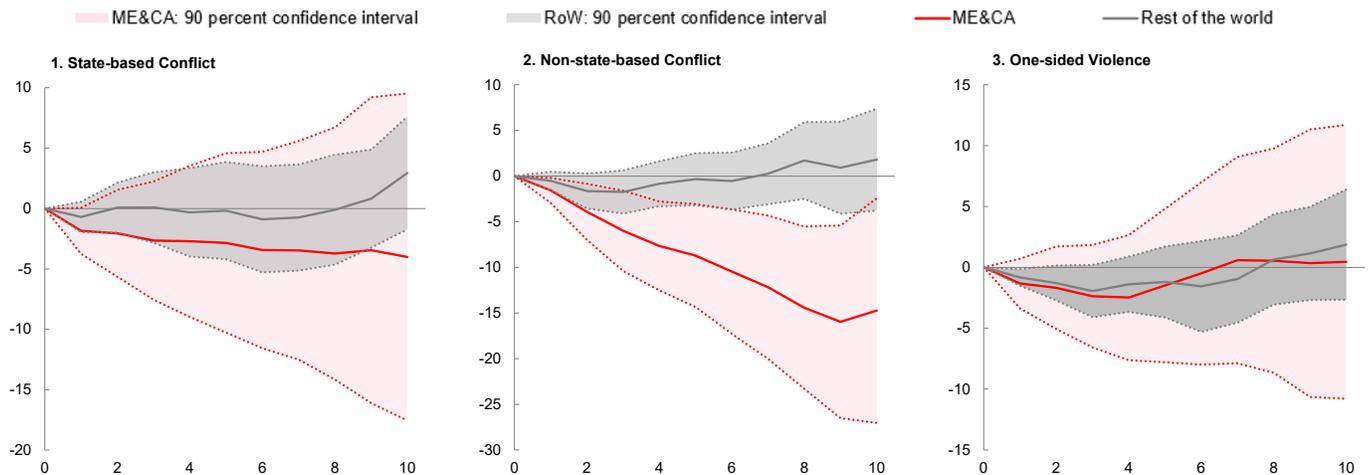


Sources: IMF, World Economic Outlook database; CEPII, Gravity database; Uppsala Georeferenced Event Database (v23.1.); and IMF staff calculations.

Note: The charts show conflict related deaths for each shock: own country, from bordering countries and from trade partners, against an ordered percentile equivalence.

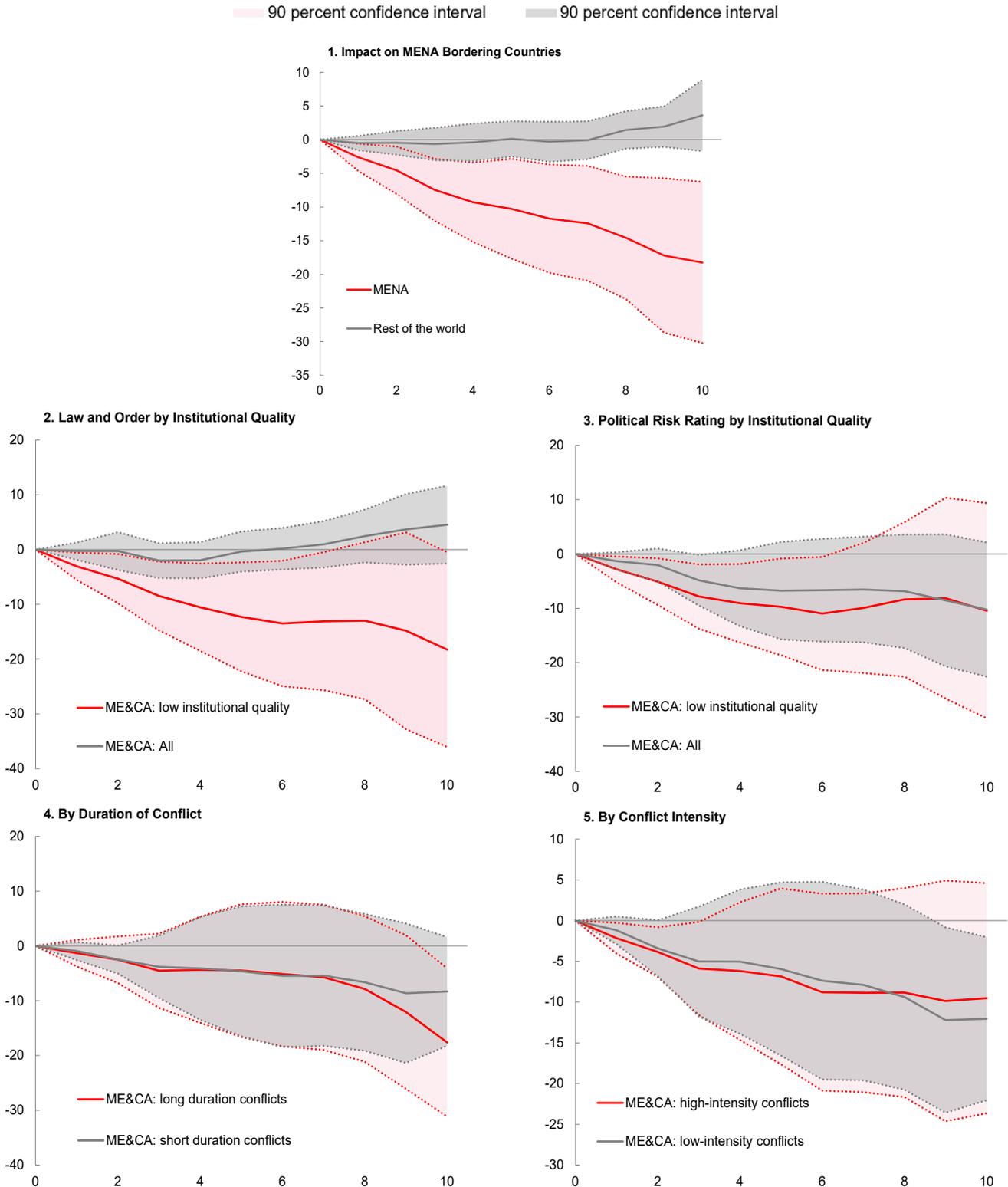
Additional Results for Bordering Countries

Annex Figure 2.6.2. Impact of Conflicts on Real GDP per Capita for Bordering Countries by Type of Conflict (Percent)



Sources: IMF, World Economic Outlook database; CEPII, Gravity database; Uppsala Georeferenced Event Database (v23.1.); and IMF staff calculations.

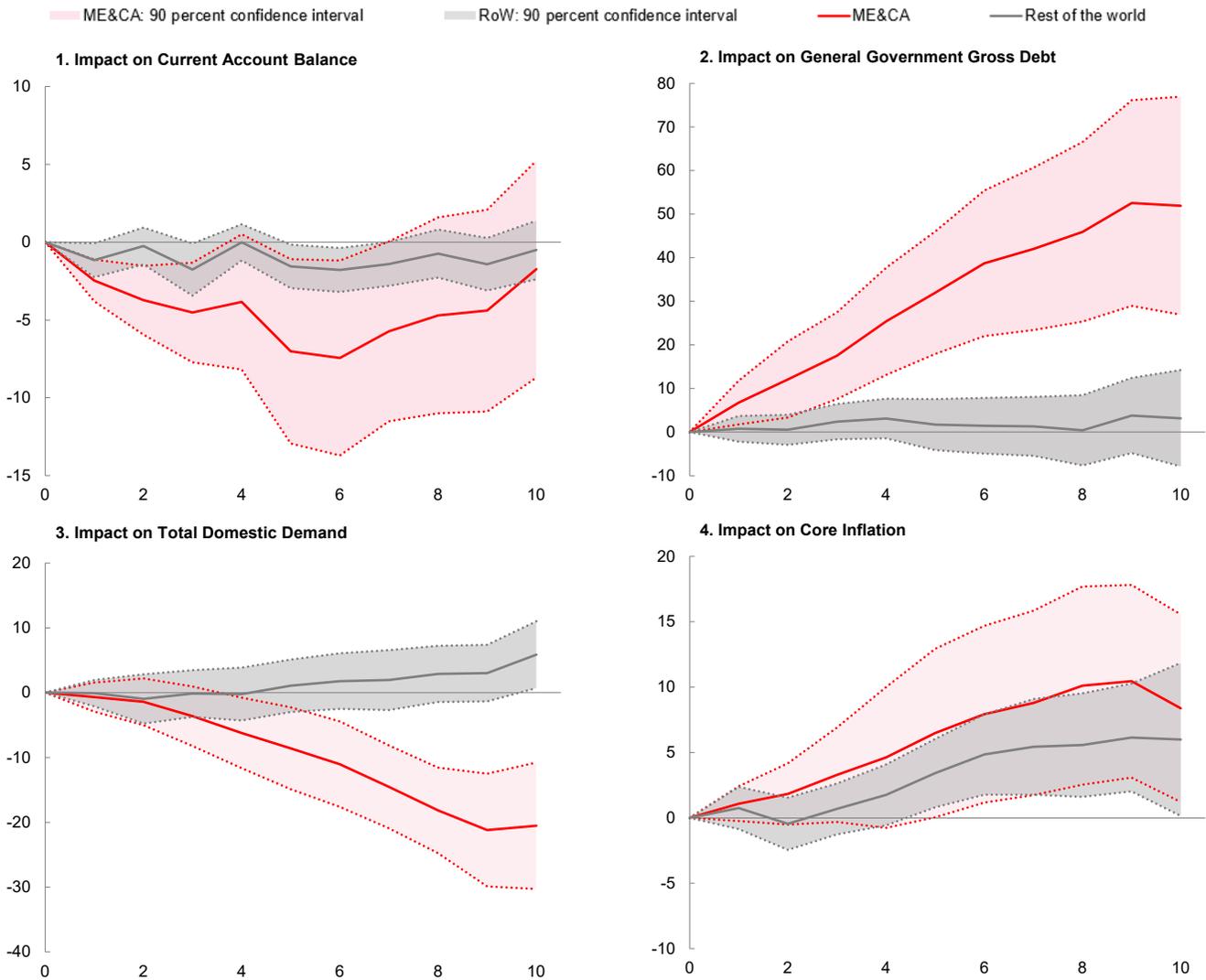
Annex Figure 2.6.3. Heterogeneous Impact of Conflict on Real GDP per Capita for Bordering Economies Depending on Country Characteristics or Nature of Conflict (Percent)



Sources: IMF, World Economic Outlook database; International Country Risk Guide (ICRG); Uppsala Georeferenced Event Database (v23.1.); and IMF staff calculations.

Note: The shock occurs in year 1 and corresponds to an increase in conflict intensity to the 75th percentile of the world distribution. The institutional quality measure is lagged. The countries with a low level of institutional quality are those with a value less than the median of the percentile distribution.

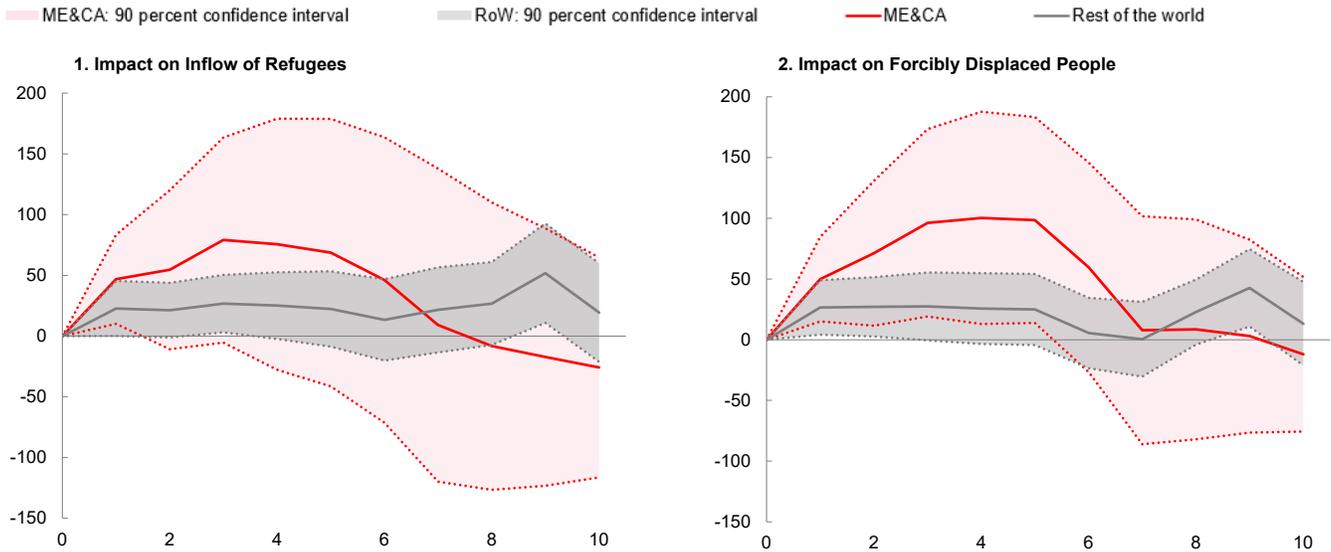
Annex Figure 2.6.4. Impact of Conflict on Macroeconomic Indicators for Bordering Economies (Percent)



Sources: IMF, World Economic Outlook database; Uppsala Georeferenced Event Database (v23.1.); and IMF staff calculations.

Note: The shock occurs in year 1 and corresponds to an increase in conflict intensity to the 75th percentile of the world distribution. The institutional quality measure is lagged. The countries with a low level of institutional quality are those with a value less than the median of the percentile distribution. ME&CA = Middle East and Central Asia.

Annex Figure 2.6.5. Impact of Conflict on Inflow of Refugee and Forcibly Displaced People in Bordering Economies (Percent)



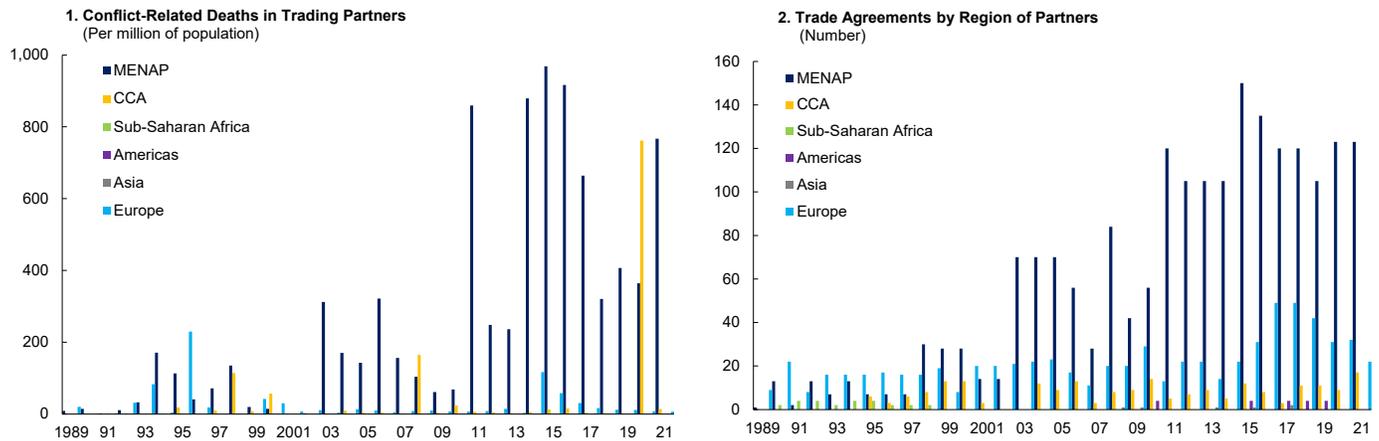
Sources IMF, World Economic Outlook database; UN Refugee Agency (UNHCR); Uppsala Georeferenced Event Database (v23.1.); and IMF staff calculations.

Note: The shock occurs in year 1. Forcibly displaced people here constitute of refugees, people of concern, asylum seekers and other people in need. ME&CA = Middle East and Central Asia.

Additional Results for Trade Partners

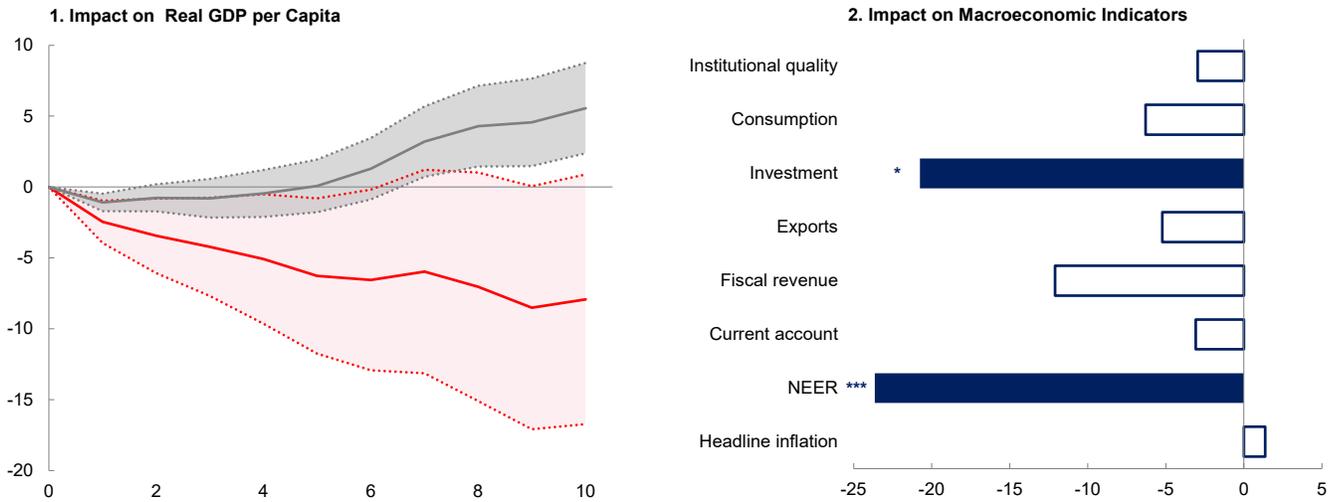
Trade agreements between MECA countries and other regions in the world is mapped below:

Annex Figure 2.6.6. ME&CA Region: Trading Partners



Sources: IMF, World Economic Outlook database; Uppsala Georeferenced Event Database (v23.1.); and IMF staff calculations.

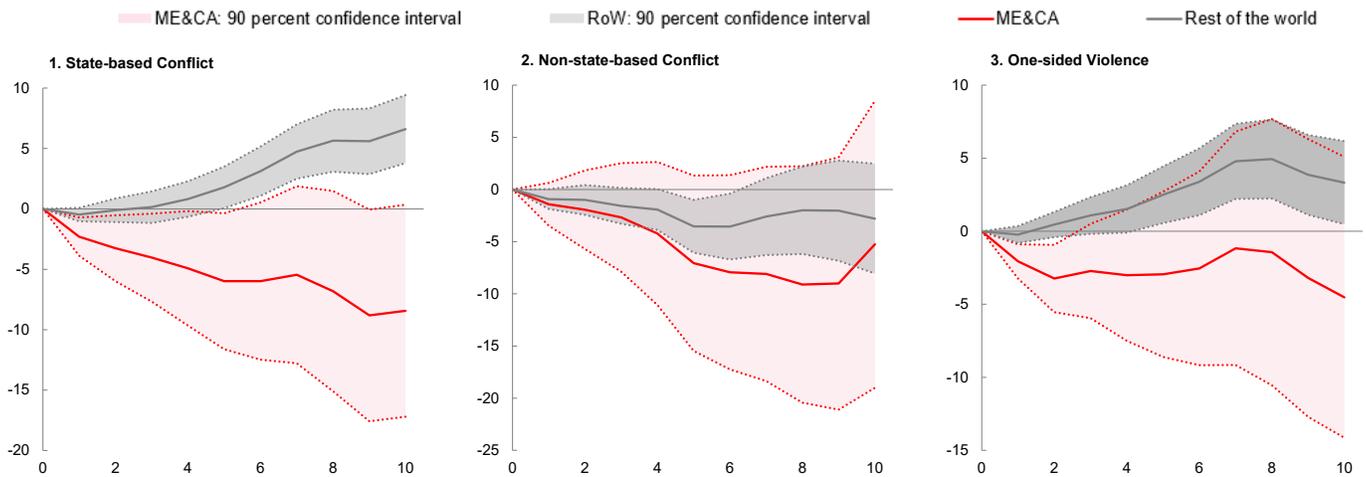
Annex Figure 2.6.7. Impact of Conflicts for Trade Partners Using Trade Agreements



Sources: IMF, World Economic Outlook database; CEPII, Gravity database; International Country Risk Guide; Uppsala Georeferenced Event Database (v23.1.); and IMF staff calculations.

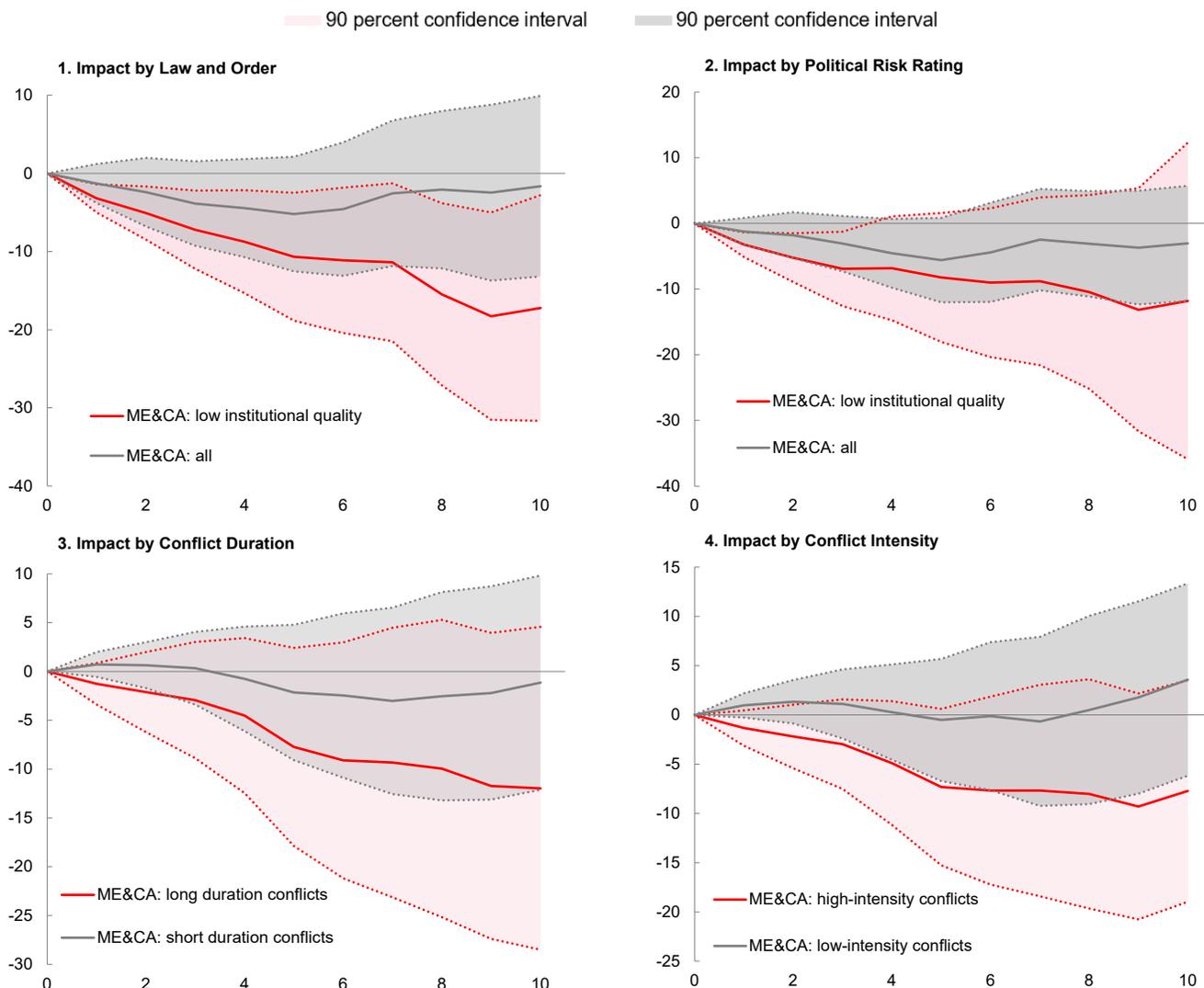
Note: Impact 7 years after the shock, which corresponds to an increase in conflict intensity to the 75th percentile of the world distribution. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent level, respectively.

Annex Figure 2.6.8. Impact of Conflicts on Real GDP per Capita for Trade Partners by Type of Conflict (Percent)



Sources: IMF, World Economic Outlook database; CEPII, Gravity database; Uppsala Georeferenced Event Database (v23.1.); and IMF staff calculations.

Annex Figure 2.6.9. Heterogeneous Impact of Conflict on GDP per Capita for Trade Partners (Percent)



Sources: IMF, World Economic Outlook database; International Country Risk Guide (ICRG); Uppsala Georeferenced Event Database (v23.1.); and IMF staff calculations.

Note: The shock occurs in year 1 and corresponds to an increase in conflict intensity to the 75th percentile of the world distribution. The institutional quality measure is lagged. The countries with a low level of institutional quality are those with a value less than the median of the percentile distribution. ME&CA = Middle East and Central Asia.

Annex Figure 2.6.10. Impact of Conflict on Macroeconomic Indicators for Trade Partners (Percent)



Sources: IMF, World Economic Outlook database; Uppsala Georeferenced Event Database (v23.1.); and IMF staff calculations.

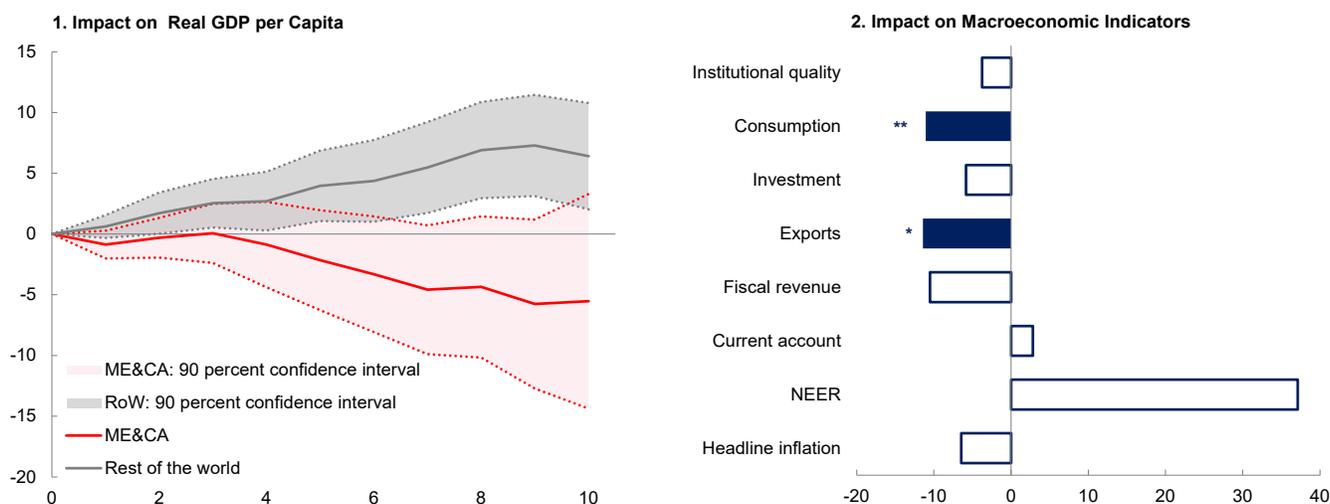
Note: The shock occurs in year 1 and corresponds to an increase in conflict intensity to the 75th percentile of the world distribution. The institutional quality measure is lagged. The countries with a low level of institutional quality are those with a value less than the median of the percentile distribution. ME&CA = Middle East and Central Asia.

As a robustness check, we use trade flows as a weight instead of trading agreements to study the impact of conflict on trading partners. The spillover shock in this case is constructed as follows:

$$\text{Spillover}_{\text{shock}_{i,t}} = \sum_j W_{i,j,t} * \left(\frac{\text{deaths}}{\text{million}} \right)_{j,t}$$

We find that the results on the impact on GDP per capita are largely consistent with using trade agreements weights, but we note some difference in the channels of impact and respective significance level. This is likely due to more missing values on the trade flows data than the data on trade agreements which is largely comprehensive and covers all countries and years in our sample.

Annex Figure 2.6.11. Impact of Conflicts on Trade Partners Using Trade Flows

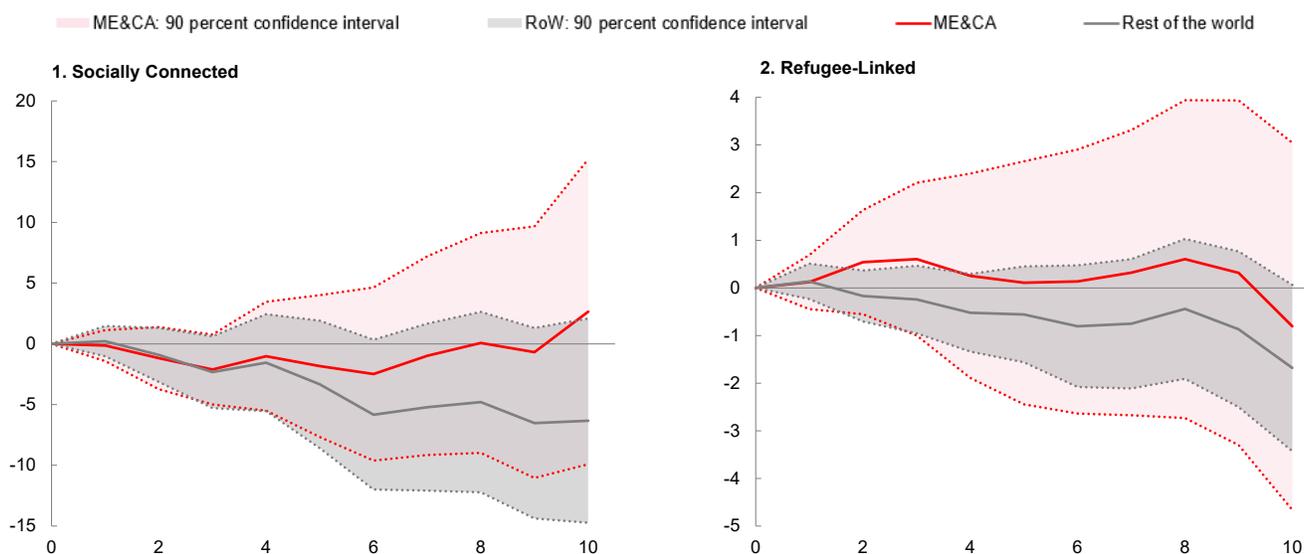


Sources: IMF, World Economic Outlook database; Uppsala Georeferenced Event Database (v23.1.); and IMF staff calculations.
 Note: The shock occurs in year 1 and corresponds to an increase in conflict intensity to the 75th percentile of the world distribution. The institutional quality measure is lagged. The countries with a low level of institutional quality are those with a value less than the median of the percentile distribution. ME&CA = Middle East and Central Asia.

Additional Results for Other Exposure Weights

Social Neighbor or Refugee linked country is a country that shares social ties with another country in conflict or has refugees from another country in conflict. We proxy for social connectedness through Facebook Social Connectedness Index as well as the ratio of refugees (from the country in conflict to the country of asylum) to the population.

Annex Figure 2.6.12. Impact of Conflicts on Real GDP per Capita for Bordering Countries (Percent)



Sources: IMF, World Economic Outlook database; UN Refugee Agency (UNHCR); Uppsala Georeferenced Event Database (v23.1.); and IMF staff calculations.

Note: The shock occurs in year 1 and corresponds to an increase in conflict intensity to the 75th percentile of the world distribution. The institutional quality measure is lagged. The countries with a low level of institutional quality are those with a value less than the median of the percentile distribution. ME&CA = Middle East and Central Asia.

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