WORLD ECONOMIC OUTLOOK

The Macroeconomics of Defense Spending, Conflicts and Recovery

World Economic Outlook
Chapters 2 & 3
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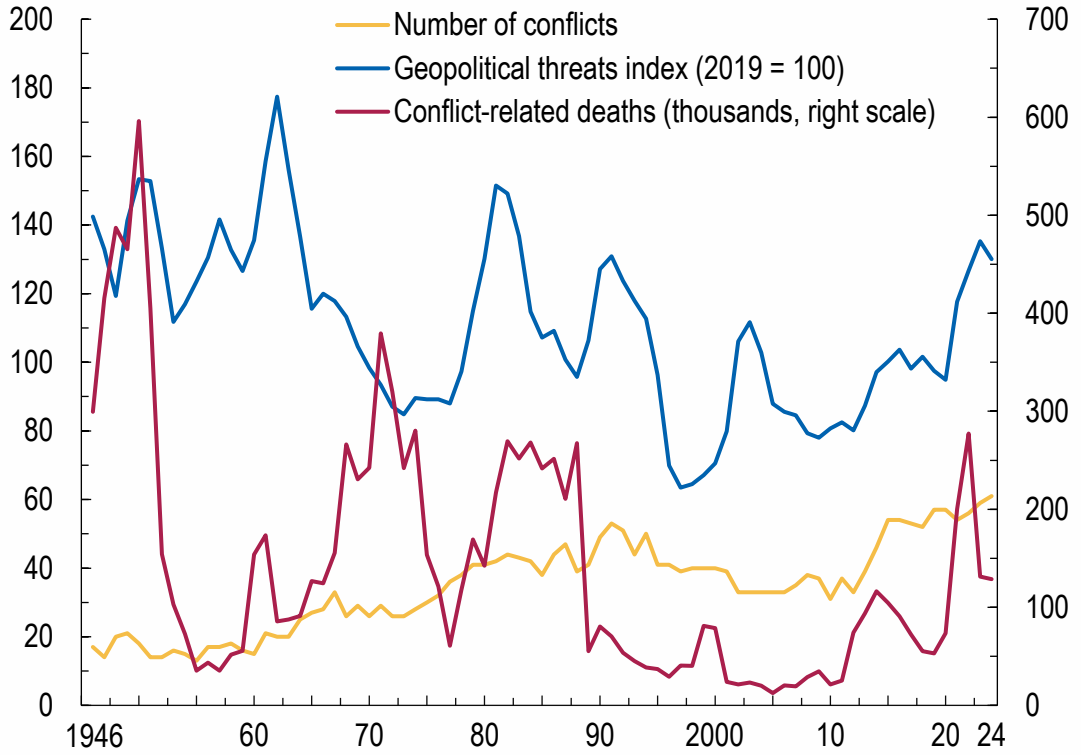
Geopolitical Threats, Conflicts and Defense Spending on the Rise

Conflicts and Geopolitical Threats

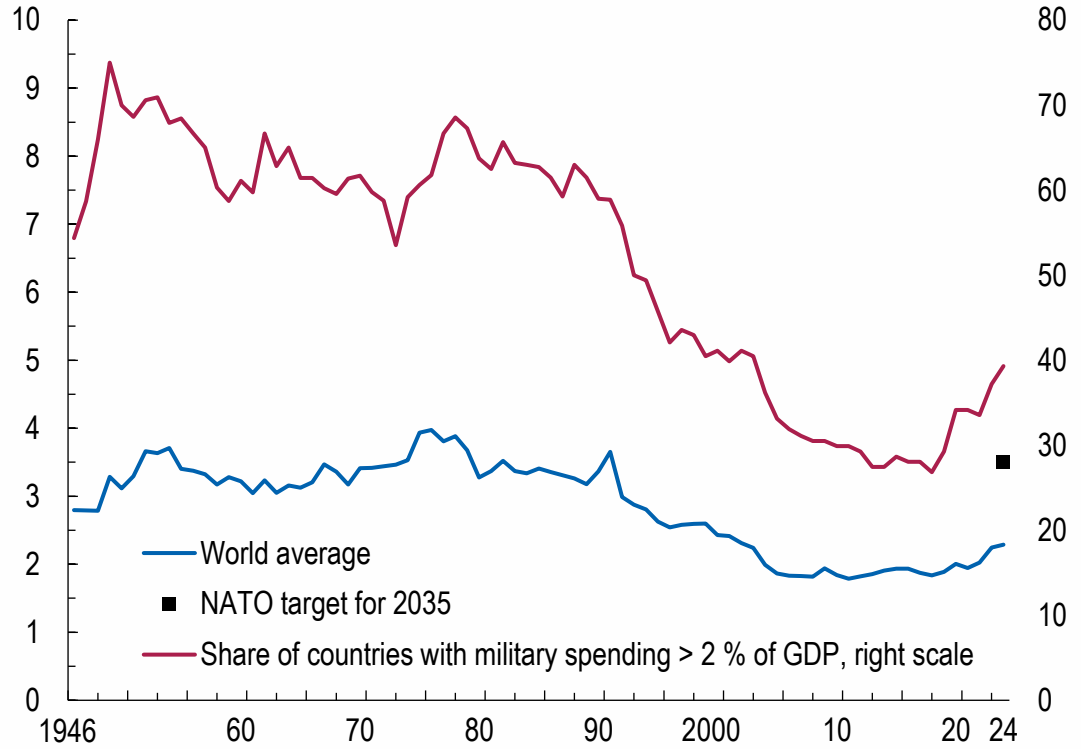
(Count of conflicts and index-left axis; thousands of deaths-right axis)



Sources: Caldara and Iacoviello (2022); PRIO Battle Deaths Dataset 3.1; UCDP Georeferenced Event Dataset (GED) 25.1; UCDP/PRIO Armed Conflict Dataset 25.1; and IMF staff calculations.

Defense Spending on the Rise

(Percent of GDP, left scale; percent, right scale)



Sources: Gethin (2024); Stockholm International Peace Research Institute Military Expenditure Database; World Human Capital Expenditure Database; and IMF staff calculations.
Note: NATO = North Atlantic Treaty Organization.

Chapter 2: Defense Spending—Macroeconomic Consequences and Trade-offs

Chapter 3: The Macroeconomics of Conflicts and Recovery

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Chapter 3: The Macroeconomics of Conflicts and Recovery

Chapter 2: Defense Spending—Macroeconomic Consequences and Trade-Offs

1. How has defense spending evolved and how is it **financed**?

2. What are the **key macroeconomic trade-offs** of defense spending build-ups?
   - Do they overheat the economy and weaken external balances?
   - Do they deteriorate fiscal positions and crowd out social spending?

3. How large are **defense spending multipliers?**
   - How do they vary depending on the policy mix and country characteristics?

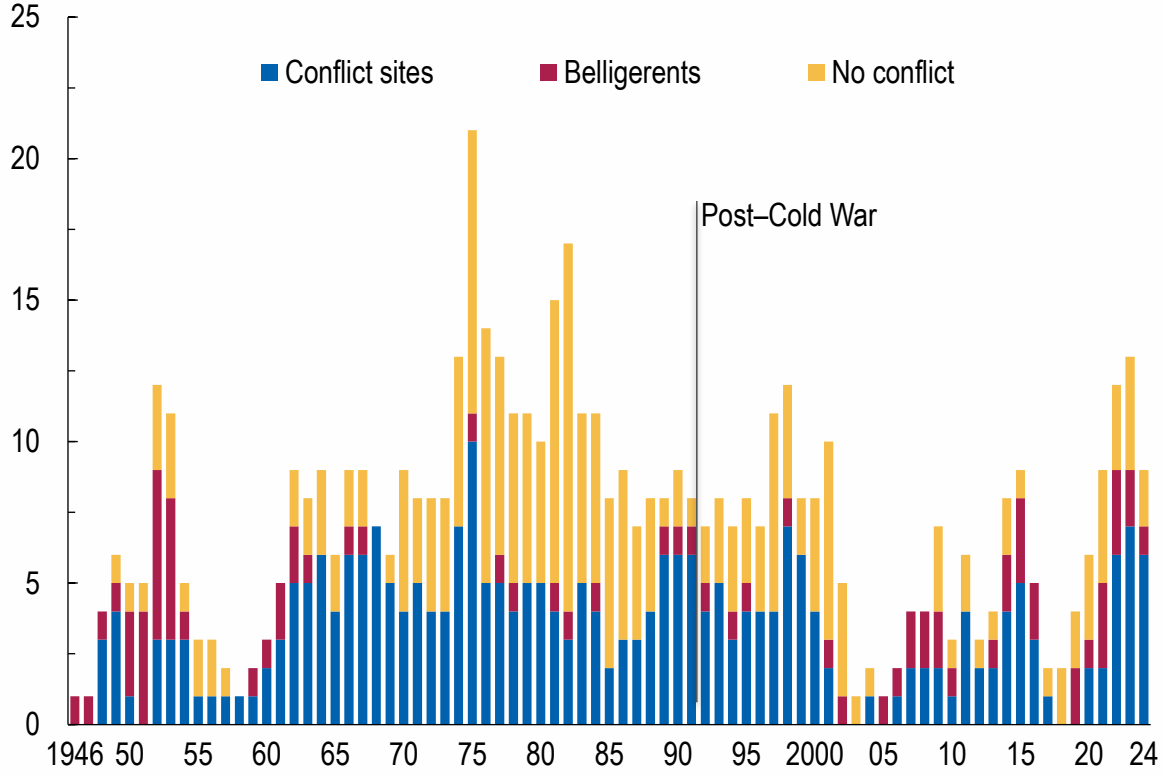
Methodology

- Empirics: analyze defense build-up episodes (up to 164 countries, 1946–2024)
- DSGE model: simulations calibrated to planned rise in EU defense spending

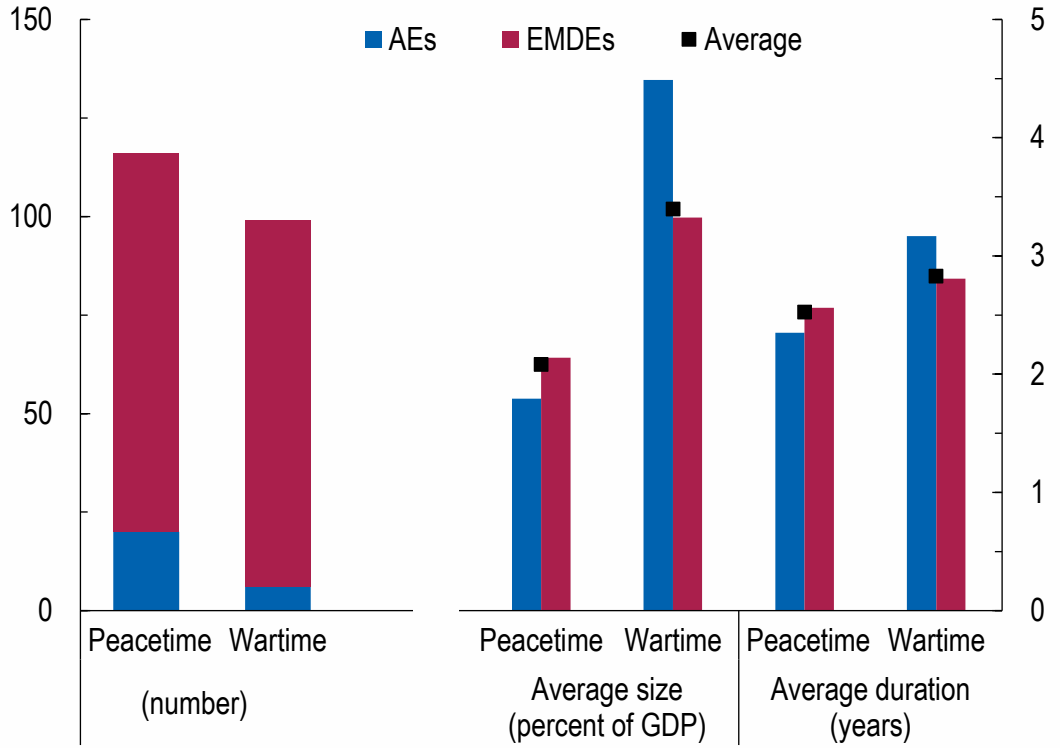
More Frequent and Sizable Defense Spending Booms

Defense spending booms have become more common, and are larger and more enduring when in wartime.

Defense Spending Booms over Time
(Number)



Defense Spending Boom Characteristics

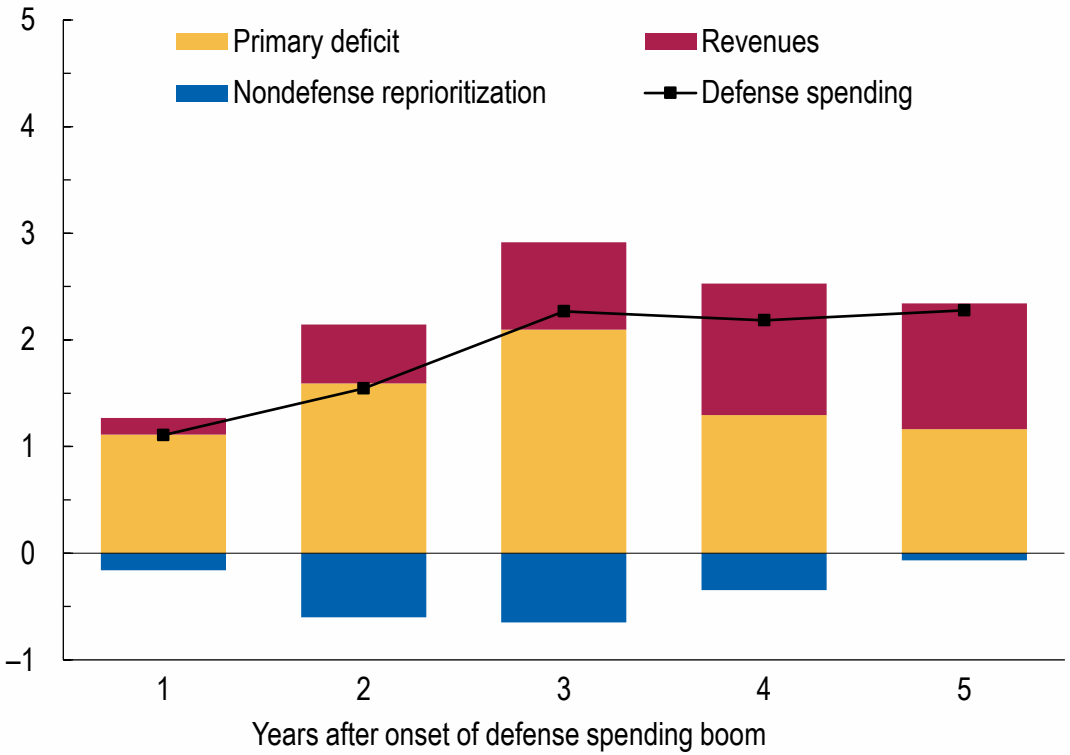


Source: IMF staff calculations.
Note: The figure shows episodes of defense spending booms, defined as periods during which the two-year moving average of defense spending increases by at least 1 percentage point of GDP, lasting for as long as defense spending does not decline as a share of GDP. Wartime (peacetime) booms are defined based on whether (or not) an on-site conflict emerges one year before or within three years following the defense spending boom onset. AEs = advanced economies; EMDEs = emerging market and developing economies.

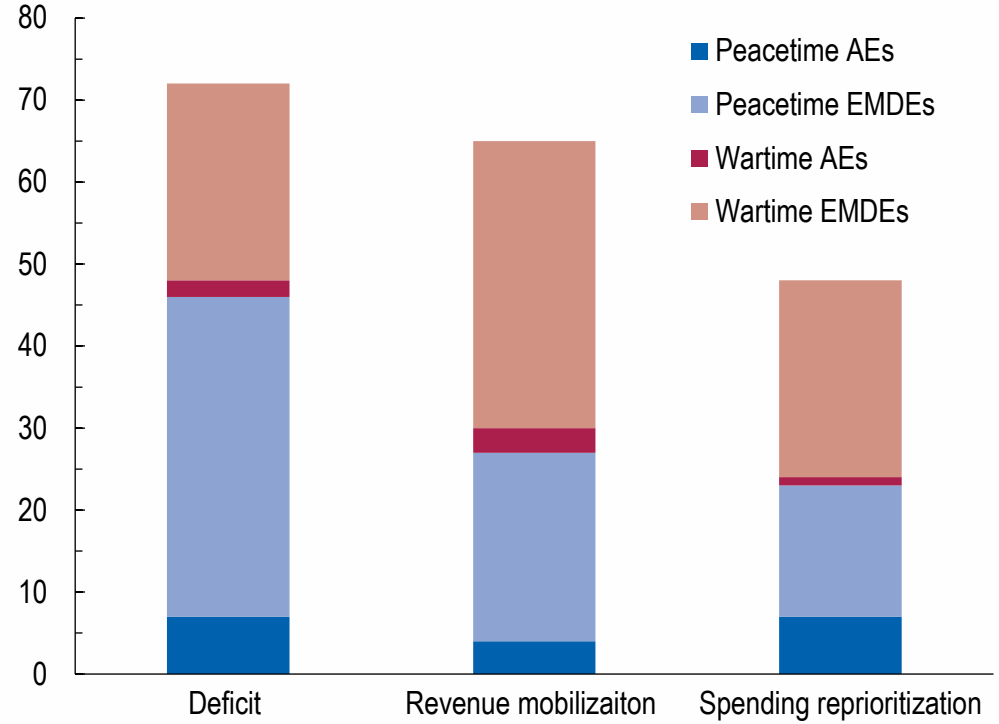
Defense Spending Booms are Mostly Deficit Financed

Defense scale-ups are front-loaded and financed mainly through deficits. Yet, revenues tend to be mobilized over time, and reprioritization plays a major role in one-fourth of episodes.

Average Boom Financing Decomposition
(Cumulative change, percentage points of GDP)



Defense Spending Booms, by Main Financing Source
(Number)



Source: IMF staff calculations.
Note: In panel 1, the black line denotes the cumulative increase in defense spending in percentage points of GDP. The horizontal axis measures the duration of the defense spending booms, in years. For each year, this increase is decomposed into its financing sources. "Nondefense reprioritization" is computed as the residual in this equation: Change in Deficit = Change in Defense Spending + Change in Nondefense Spending - Change in Revenues. In panel 2, wartime (peacetime) booms are defined based on whether an on-site conflict emerges one year before or within three years following the corresponding defense spending boom onset. AEs = advanced economies; EMDEs = emerging market and developing economies.

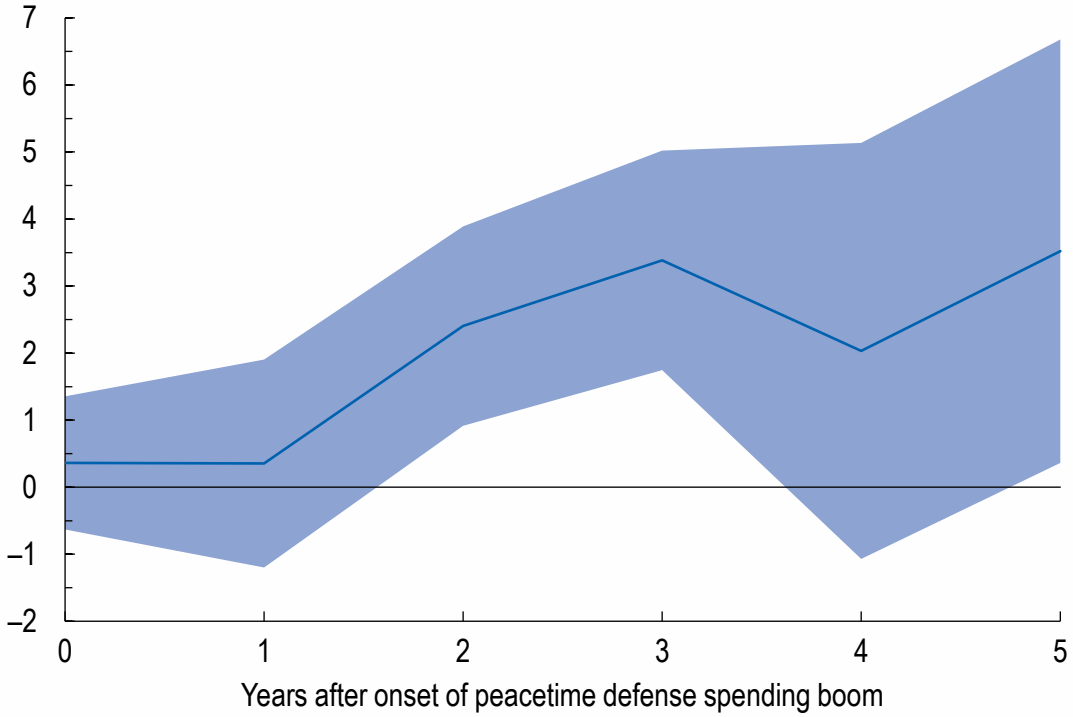
Macroeconomic Effects of Defense Spending:

Empirical Evidence

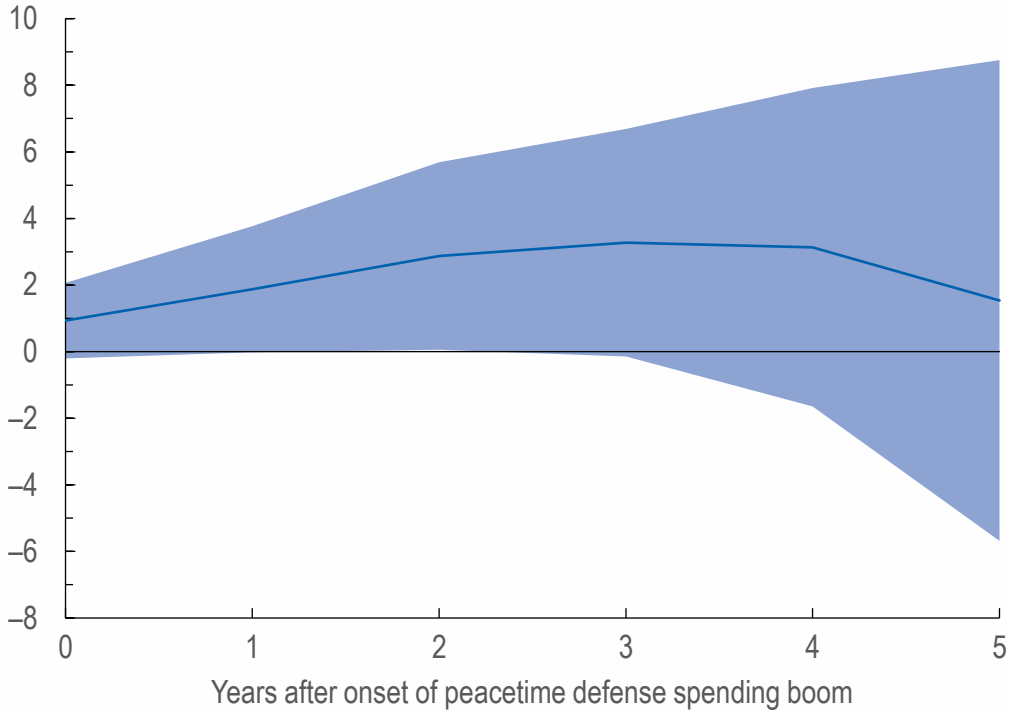
Defense Spending Booms Raise Output and Prices...

Defense buildups imply a growth-inflation trade-off, which calls for close coordination with monetary policy to temper inflationary pressures.

Real GDP
(Percent)



Consumer Price Index
(Percent)



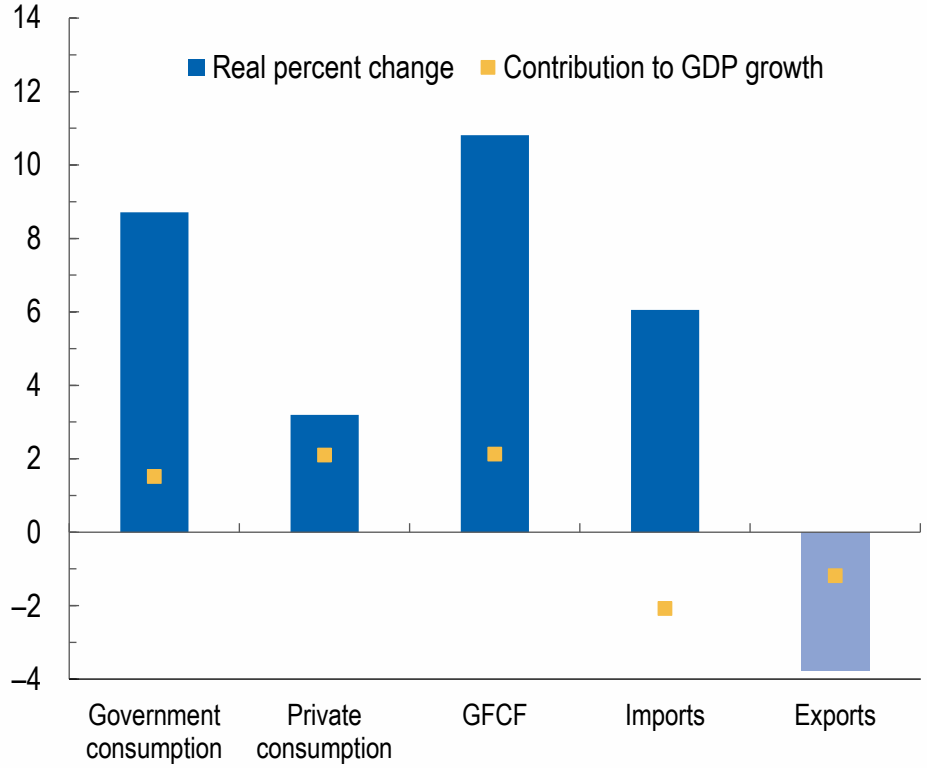
Source: IMF staff calculations.
Note: The panels plot local-projection estimates of cumulative responses to peacetime defense spending booms. Fragile and conflict-affected states, as well as commodity-exporting emerging market and developing economies, are excluded from the sample. The sample period spans 1946–2024. Solid lines denote point estimates, and shaded areas denote 90 percent confidence intervals.

...Acting as a Positive Sector-Specific Demand Shock...

The output boost is driven by higher domestic absorption, as well as capital stock and total factor productivity. Yet, a high import content (e.g., for military equipment) worsens the external balance.

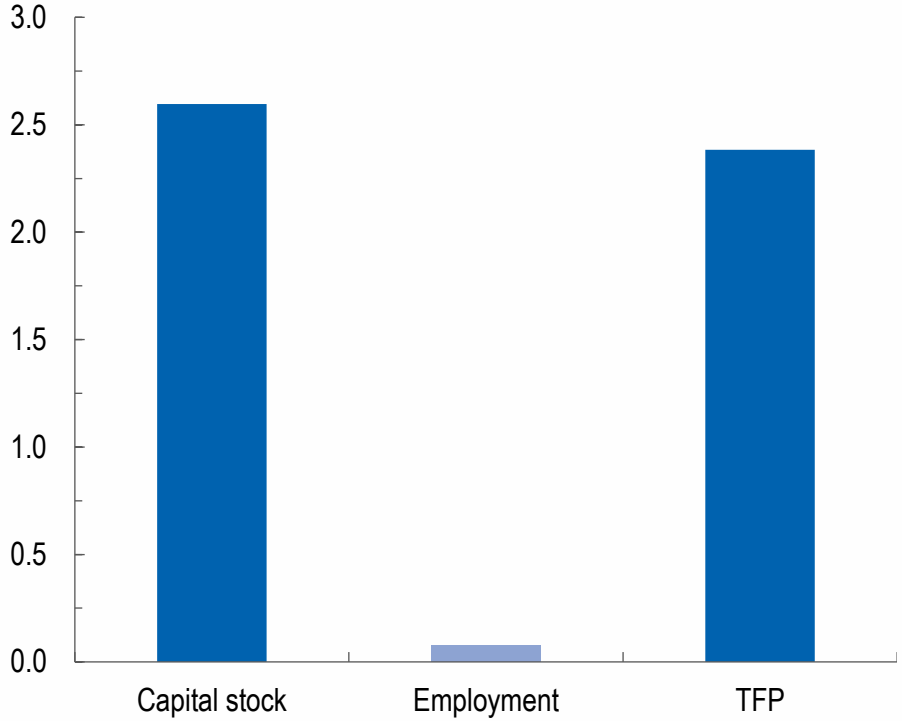
Components of Real GDP

(Percent, three years ahead)



Factors of Production

(Percent, three years ahead)



Source: IMF staff calculations.

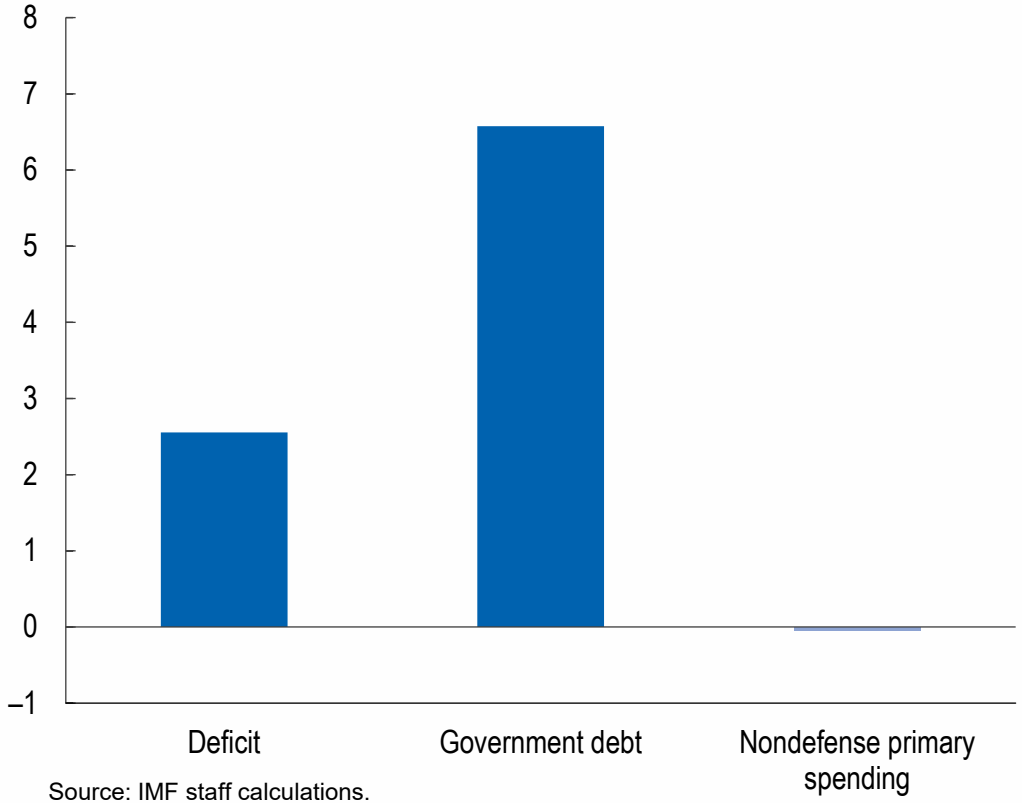
Note: The panels plot the three-year-ahead coefficients from local-projection estimates of cumulative responses to peacetime defense spending booms. Fragile and conflict-affected states, as well as commodity-exporting emerging market and developing economies, are excluded from the sample. The sample period spans 1946–2024. Darker-colored bars denote coefficients that are statistically significant at the ten percent level. GFCF = gross fixed capital formation; TFP = total factor productivity.

… While Fiscal Positions Weaken and Imply Trade-offs

The reliance on deficit financing raises debt-to-GDP ratios by 7pp over 3 years. Instead, when financing comes from reprioritizing the budget, social spending tends to be crowded out (guns-vs-butter trade-off).

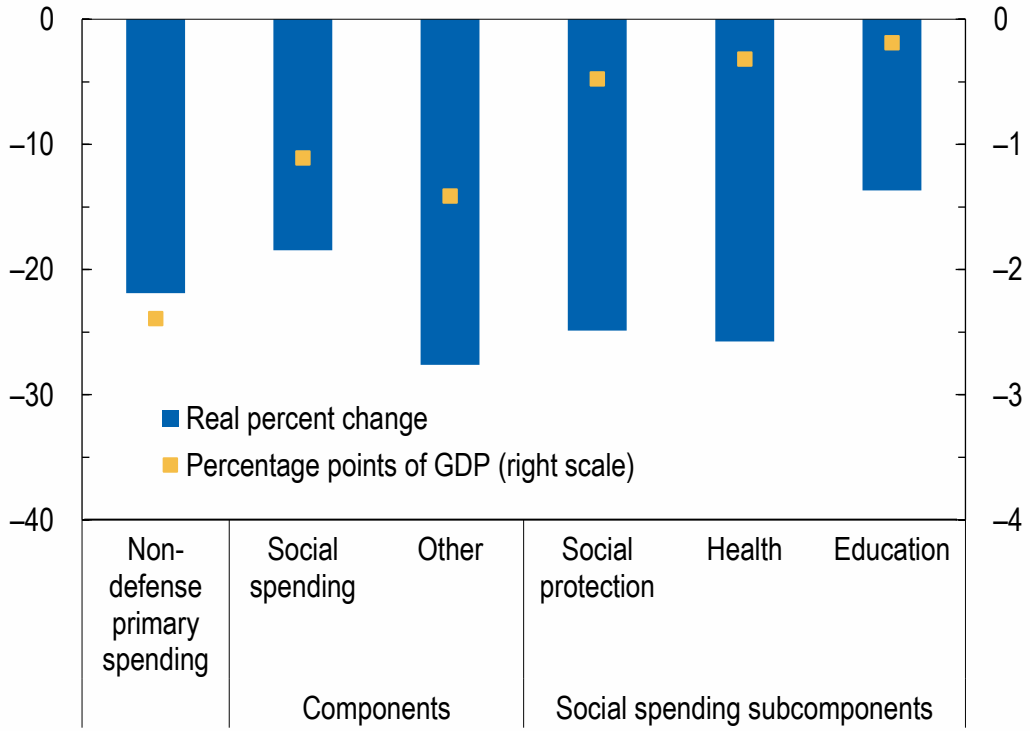
Fiscal Imbalances: All Defense Spending Booms

(Percentage points of GDP, three years ahead)



Reduction of Social Spending: Booms Financed by Spending Reprioritization

(Estimate, three years ahead)



Source: IMF staff calculations.

Note: The panels plot the three-year-ahead coefficients from local-projection estimates of cumulative responses to defense spending booms. Wartime (peacetime) booms are defined based on whether (or not) an on-site conflict emerges one year before or within three years following a defense spending boom onset. The sample period spans 1946–2024. Darker-colored bars denote coefficients that are statistically significant at the 10 percent level.

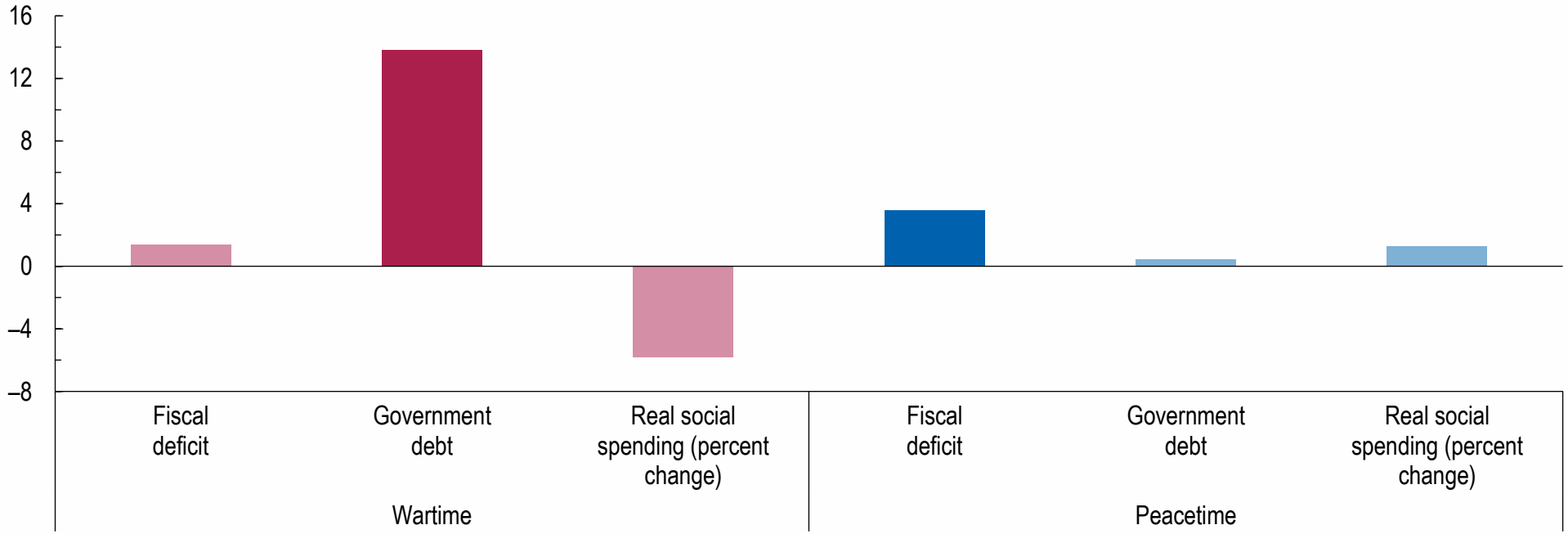
Wartime Booms Imply Costlier Trade-offs

During wartime, public debt rises sharply, despite spending reprioritization helping to contain deficits over time.

During peacetime, guns vs. butter trade-off and effect on public debt are muted (multiplier effect).

Fiscal Imbalances: Wartime and Peacetime Booms

(Percentage points of GDP, three years ahead)

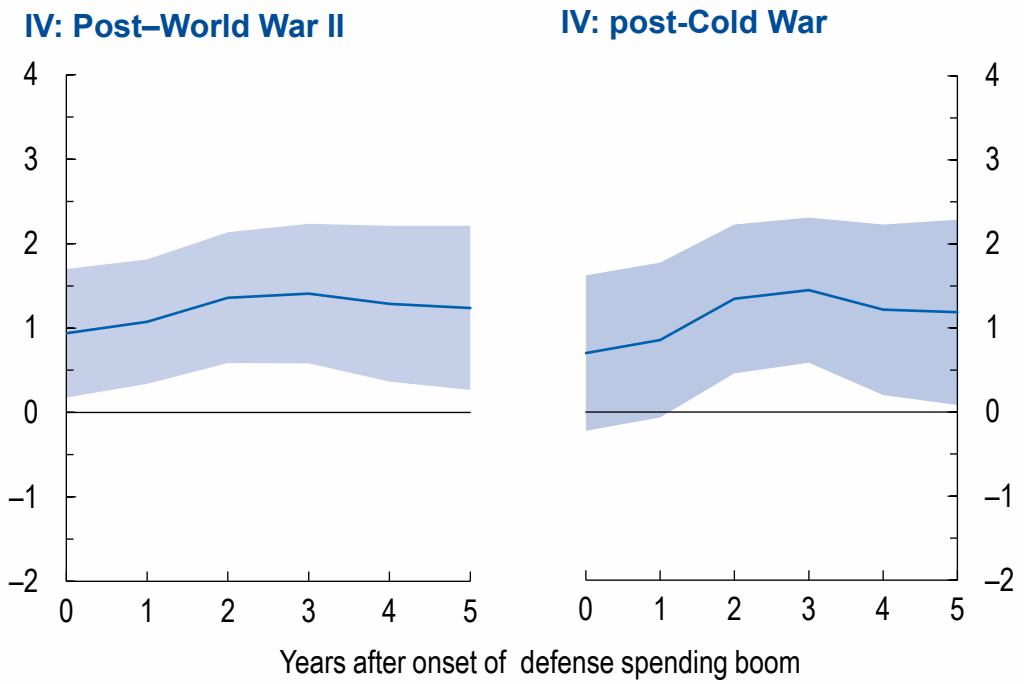


Source: IMF staff calculations.
Note: The figure plots the three-year-ahead coefficients from local-projection estimates of cumulative responses to defense spending booms. Wartime (peacetime) booms are defined based on whether (or not) an on-site conflict emerges one year before or within three years following a defense spending boom onset. The sample period spans 1946–2024. Darker-colored bars denote coefficients that are statistically significant at the 10 percent level.

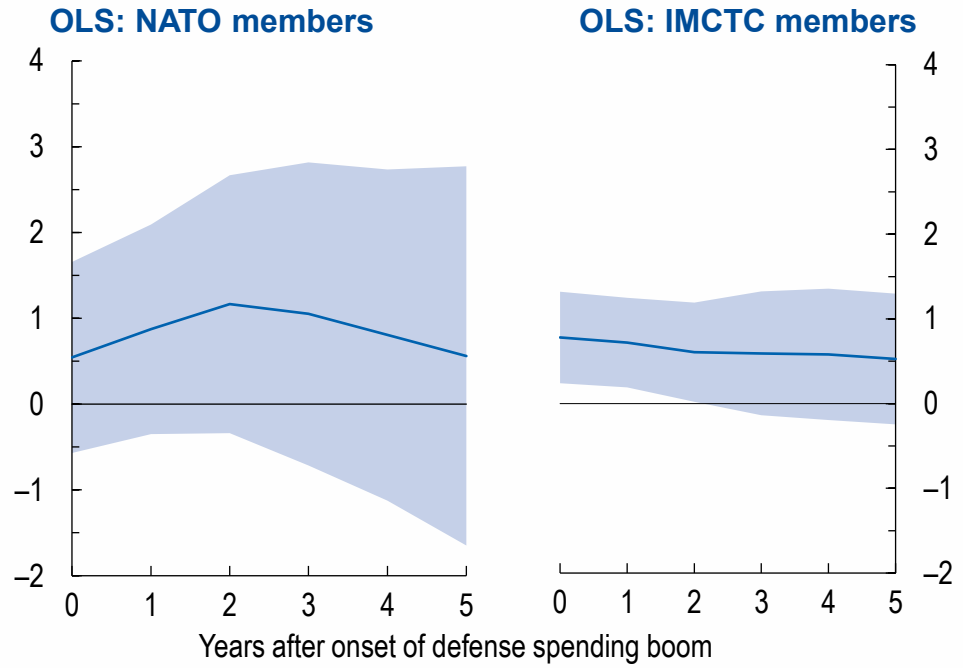
Estimated Defense Spending Multipliers are Close to 1…

- To mitigate endogeneity concerns, we consider:
  - i. Exogenous narrative peacetime defense spending booms as an IV; and
  - ii. Sub-samples for which defense spending is plausibly more exogenous

(i) IV Approach
(Cumulative multipliers)



(ii) Subsamples, post-Cold War
(Cumulative multipliers)



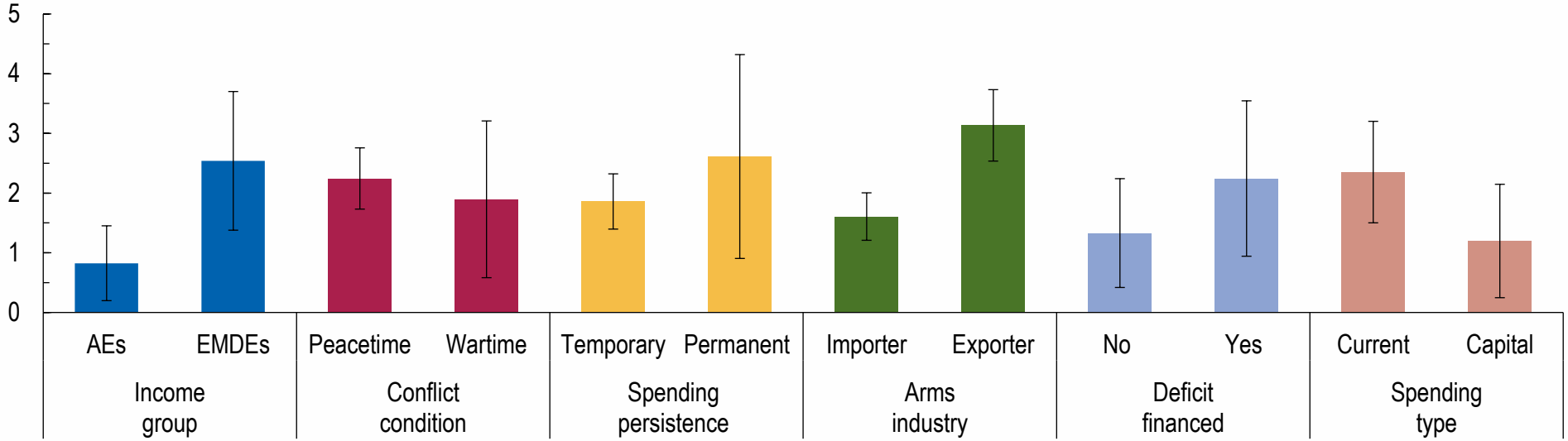
Source: IMF staff calculations.
Note: The panels plot local-projection estimates of cumulative responses of output to defense spending. Fragile and conflict-affected states are excluded from the sample. The sample period spans 1991-2024 in panels 1, 2, and 4 and 1946–2024 in panel 3. In panels 3–4, multipliers are estimated using narrative defense spending booms as an instrument for defense spending. Solid lines denote point estimates, and shaded areas denote 90 percent confidence intervals. See Online Annex 2.5 for details. IMCTC = Islamic Military Counter Terrorism Coalition; IV = instrumental variable; NATO = North Atlantic Treaty Organization; OLS = ordinary least squares.

… But Vary Widely Depending on Country and Boom Features

- Defense spending multipliers are higher:
  - For **EMDEs** than AEs (this reverses in post-Cold War period);
  - When defense buildup is more **permanent**, **deficit-financed**, and allocated towards **current spending**; and
  - For **arms producers** (lower import leakage).

Differences in Defense Spending Multipliers

(Cumulative multipliers, three years ahead)



Source: IMF staff calculations.

Note: The figure shows nonlinearities in the size of three-year-ahead cumulative multipliers by income group, conflict status, boom persistence, size of defense industry, sources of financing, and spending composition. "Wartime" ("Peacetime") is defined based on whether (or not) an on-site conflict has occurred in the past year or occurs within three years ahead. A change in defense spending in year t is defined as "Permanent" if the direction of the change in the ratio of defense spending to GDP in that year is sustained over the subsequent 10 years and as "Temporary" otherwise. "Importer" ("exporter") refers to economies in which the average share of arms exports in their arms trade is below (above) the median for the sample. "Deficit financed" is defined based on whether the annual change in a country's defense spending is mostly driven by a change in its deficit (rather than by changes in its revenues or nondefense spending). "Current" spending comprises personnel and operating expenses, whereas "Capital" spending comprises spending on equipment and infrastructure. Bars denote point estimates, and whiskers denote 90 percent confidence intervals. AEs = advanced economies; EMDEs = emerging market and developing economies.

Defense Spending Trade-offs: Model-based Analysis

Modeling Defense Spending in a GE Framework

Multi-region DSGE model for European Union (IMF's *Flexible System of Global Models*) to assess the dynamic macroeconomic effects of defense spending buildup.

1. **Baseline scenario** calibrated to pre-war (2021) defense spending, import intensity, and other variables:
   - The **EU spending shock** is measured by the difference between current and projected defense spending and pre-war levels;
   - Defense spending is fully **debt financed** through 2028. Offsetting measures are introduced in 2029 and fully implemented by 2033

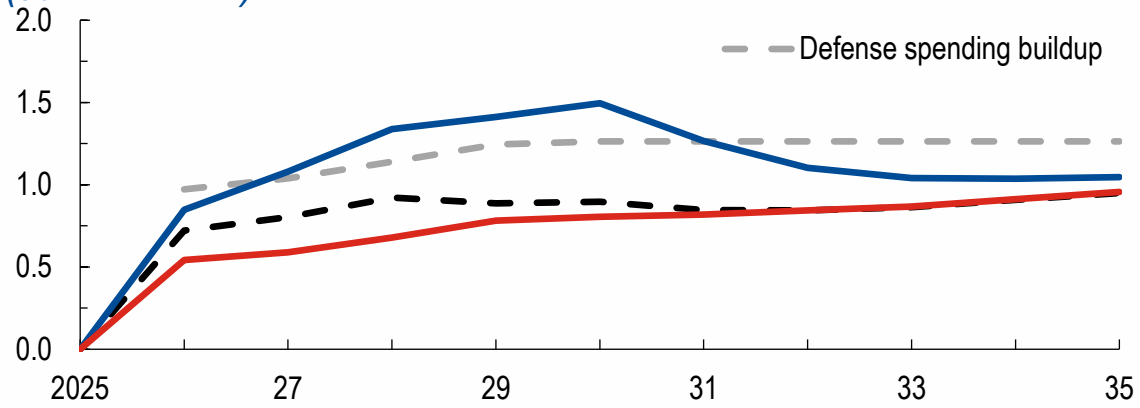
2. **Alternative scenarios**:
   i. Monetary accommodation
   ii. Immediate fiscal measures
   iii. A coordinated EU-level spending
   iv. Higher share of investment in composition of defense spending

Defense Spending: Baseline and Alternative Policy Scenarios

- *Baseline: short-run GDP growth is boosted, but inflation rises and fiscal and external balances deteriorate.*
- *Monetary policy accommodation risks overheating the economy, while fiscal measures dampen demand effects.*

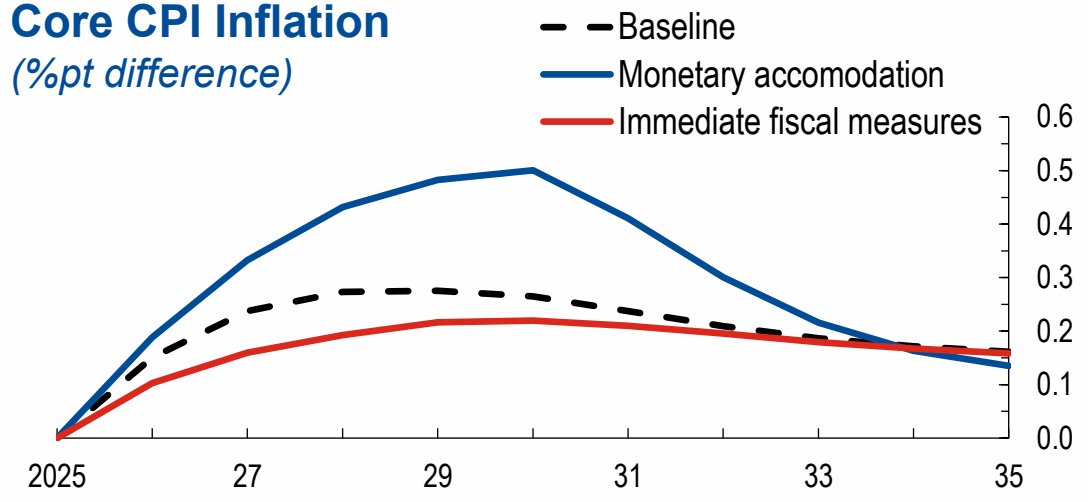
GDP Path of Shock and Real GDP

(% difference)



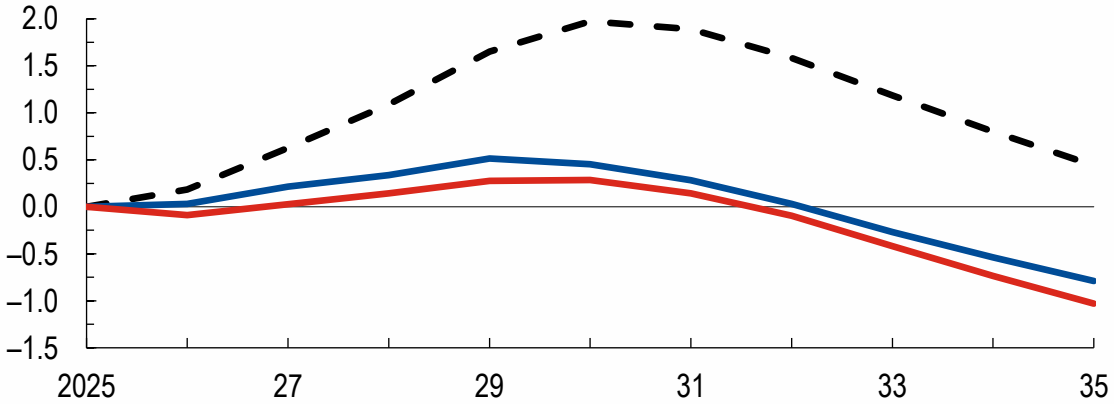
Core CPI Inflation

(%pt difference)



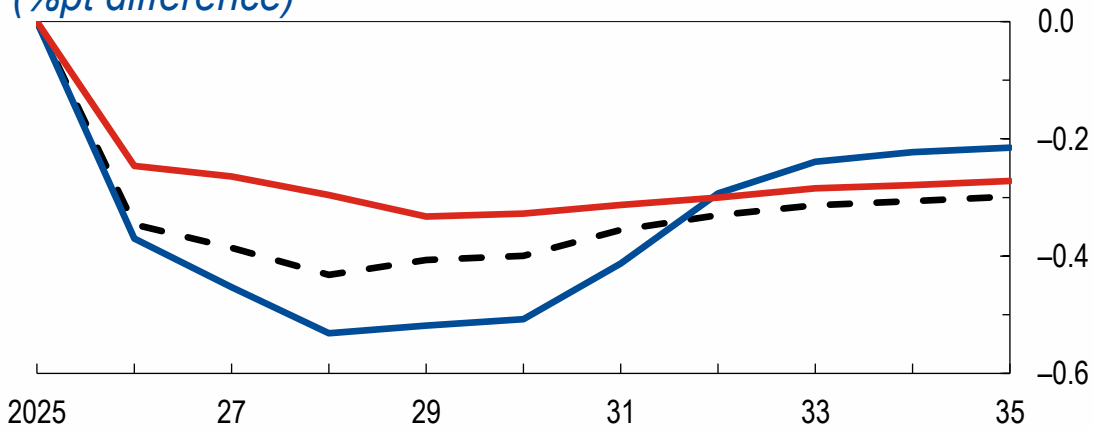
Government Debt/GDP

(%pt difference)



Current Account/GDP

(%pt difference)



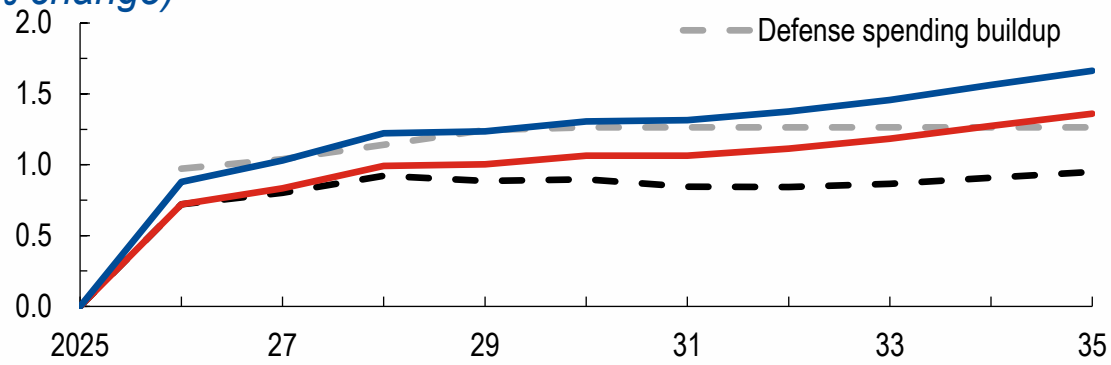
Source: IMF staff calculations.
Note: The figure presents model simulations calibrated to a defense spending shock in the European Union. The monetary accommodation scenario assumes that the central bank does not react following a standard interest rate rule. The immediate fiscal measures scenario assumes that offsetting measures are implemented immediately rather than gradually to make the defense spending shock budget neutral.

Higher Investment Spending and Coordinated Defense Spending

- *Coordinated defense spending and financing can raise the productivity of defense investment (via economies of scale and innovation spillovers), and lower borrowing costs and import content, but also raises inflation pressures.*
- *Higher defense investment boosts long-run output, but worsens fiscal and external positions.*

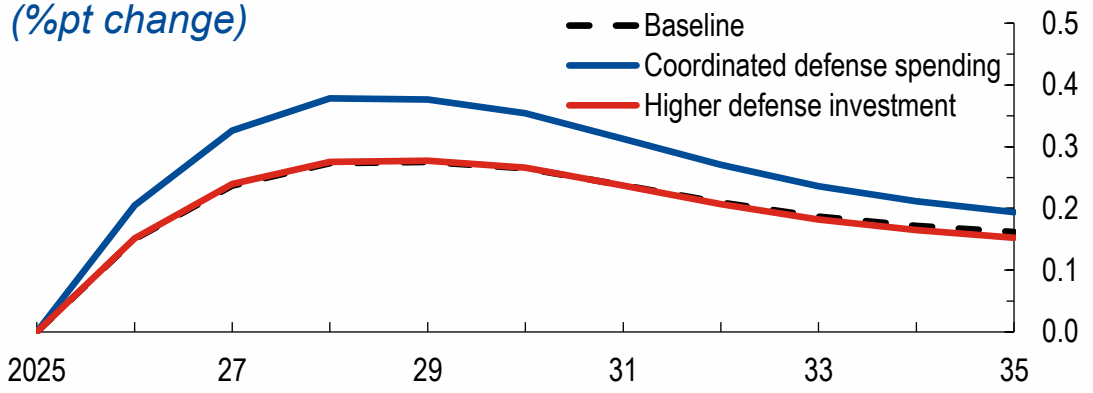
Defense Spending Shock and Real GDP

(% change)



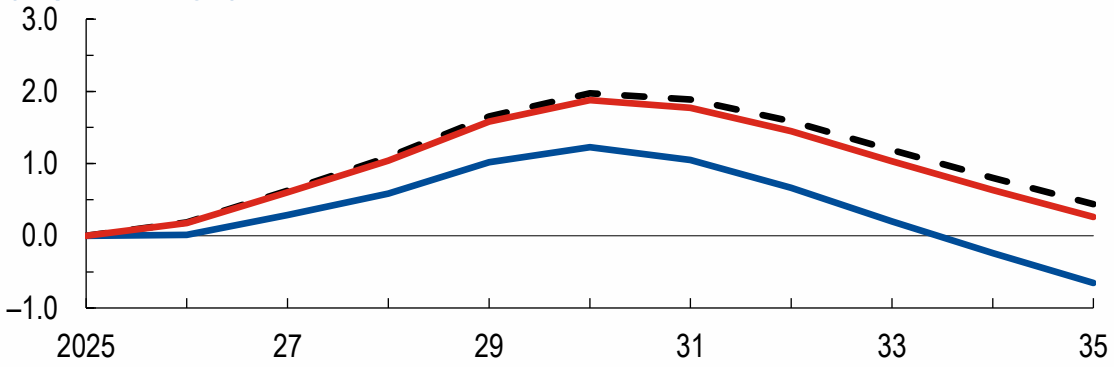
Core CPI Inflation

(%pt change)



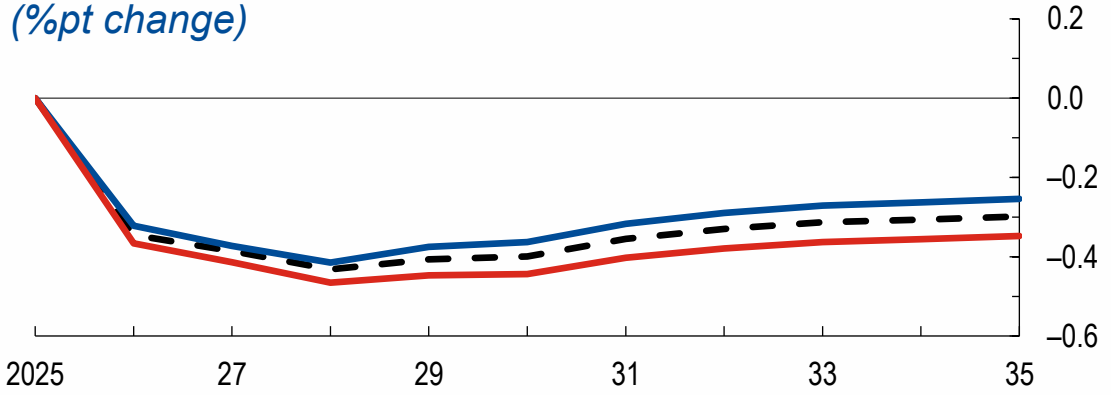
Government Debt/GDP

(%pt change)



Current Account/GDP

(%pt change)



Source: IMF staff calculations.

Note: The figure presents the model simulations calibrated to a defense spending shock in the European Union. The higher defense investment scenario assumes a larger share (40 percent rather than 20 percent) of government defense spending allocated to investment. The coordinated defense spending scenario assumes a lower import content of the spending shock, a 20 basis point reduction in the risk premiums, and a 20 percent increase in the productivity of public investment.

Key Takeaways

- **Main findings**:
  - Defense spending booms are **more frequent, sizable, and mostly debt-financed**
  - **Output** gains are **modest on average**
    - Sector-specific **demand shock**
    - Increased capacity utilization and possibly productivity gains
    - **Weakened fiscal and external balances**, and risk crowding out social spending
  - The fiscal **multiplier** is **close to one**, with substantial heterogeneity (degree of import leakages, policy mix, and spending composition)

- **Policy implications**:
  - Integrate defense buildup within a credible **medium-term fiscal framework**;
  - Carefully **manage macroeconomic conditions** to prevent overheating and friction costs;
  - **Balance spending composition** between short-term stimulus and long-term productivity; and
  - Strengthen alliance-level **coordination on procurement and financing** when feasible

Chapter 2: Defense Spending—Macroeconomic Consequences and Trade-offs

Chapter 3: The Macroeconomics of Conflicts and Recovery

Chapter 3: The Macroeconomics of Conflicts and Recovery

1. **Macroeconomic dynamics during conflicts**
   - What are the macroeconomic effects of conflicts?
   - Through which channels do they operate, and what are the trade-offs?
   - What are their long-term scarring effects?

   Methodology
   - Empirics: macro and micro analysis of conflict onsets (~190 economies, 1946–2024)

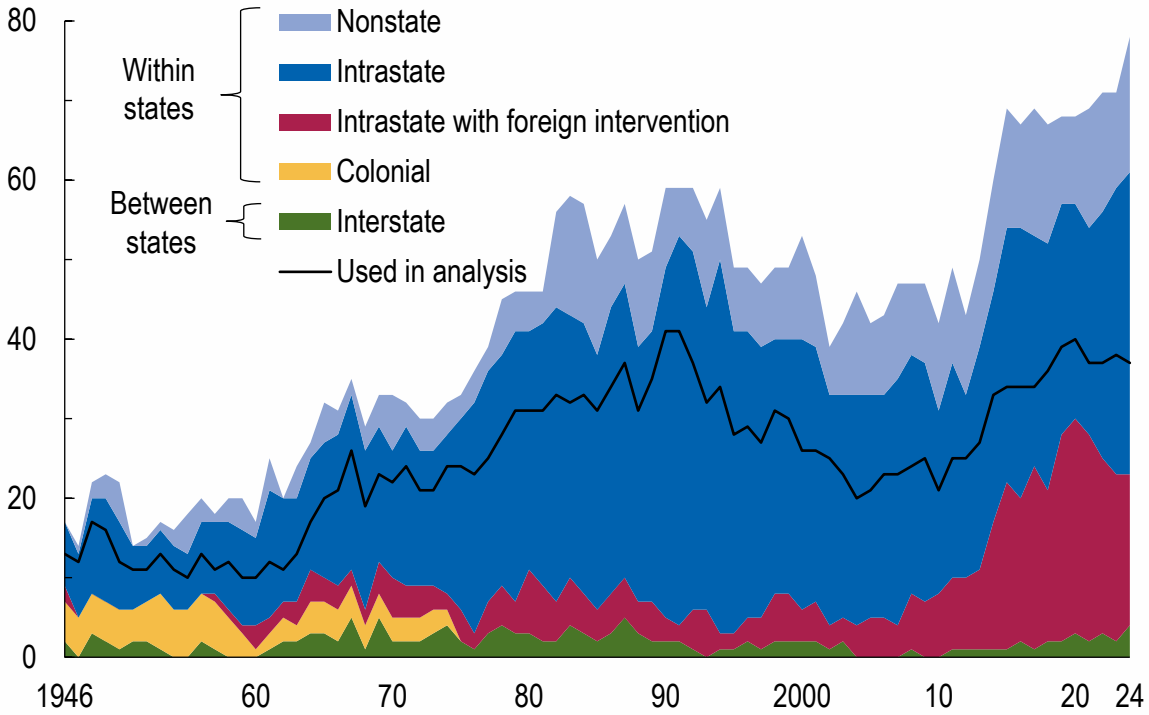
2. **Post-conflict recovery**
   - How do economies recover after conflicts?
   - How do they achieve macroeconomic stabilization?
   - To what extent do policies shape post-conflict recovery?

   Methodology
   - Empirics: macro dynamics following conflict termination (~190 economies, 1946–2024); 6 case studies; micro evidence (development project outcomes, subnational, and firm-level analysis)
   - Model: simulations of policies for post-conflict recovery

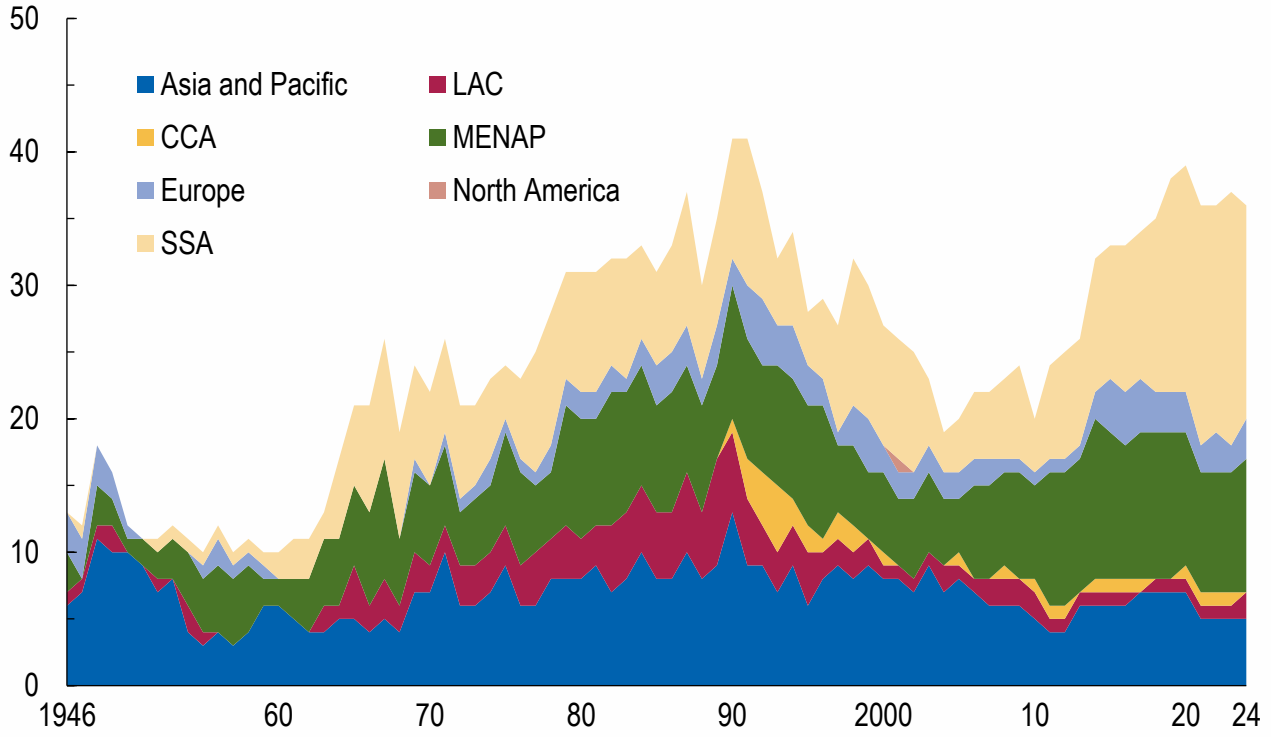
Post-World War II Conflicts

Conflicts are rising, predominantly within states and, more recently, between states, with an uneven distribution across regions.

Global Post-World War II Conflicts
(Number of conflicts)



Conflicts by Geographical Region
(Number of conflicts, used in analysis)



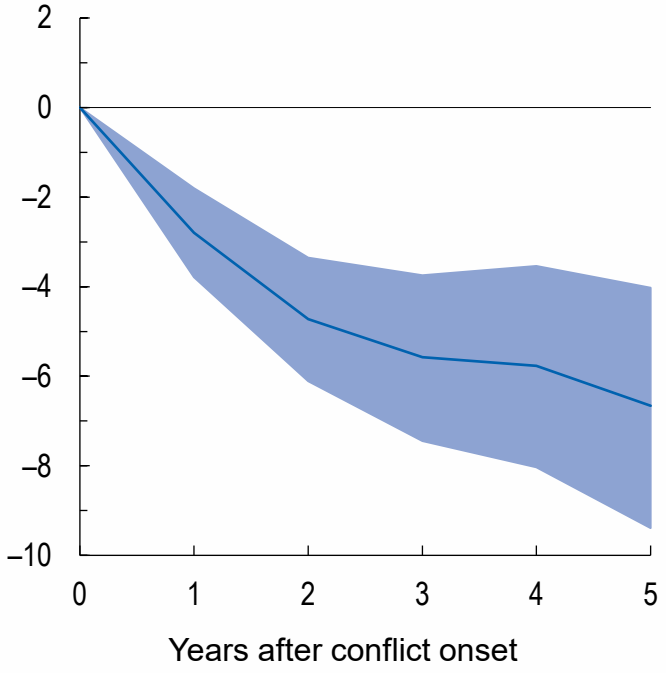
Sources: UCDP/PRIO Armed Conflict Dataset version 25.1; and IMF staff calculations.
Note: The figure shows the number of active conflicts per year with at least 25 battle-related deaths, aggregated by conflict type. Nonstate conflicts involve organized nongovernment actors and are identified based on the IMF staff's construction using text analysis of annual reports from the United Nations Security Council. The black line indicates the subset of conflicts of focus in the chapter's analysis. CCA = Caucasus and Central Asia; LAC = Latin America and the Caribbean; MENAP = Middle East, North Africa, Afghanistan, and Pakistan; SSA = Sub-Saharan Africa.

Macroeconomic Dynamics During Conflicts

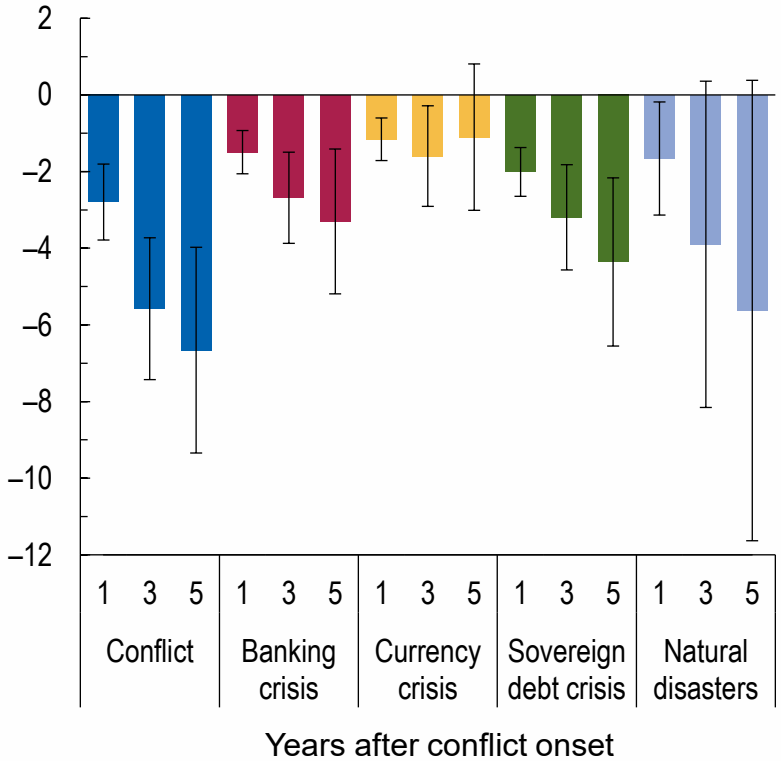
Large, Persistent Output Losses in Conflict-site Economies

Conflicts impose large economic costs, exceeding those from financial crises and severe natural disasters.

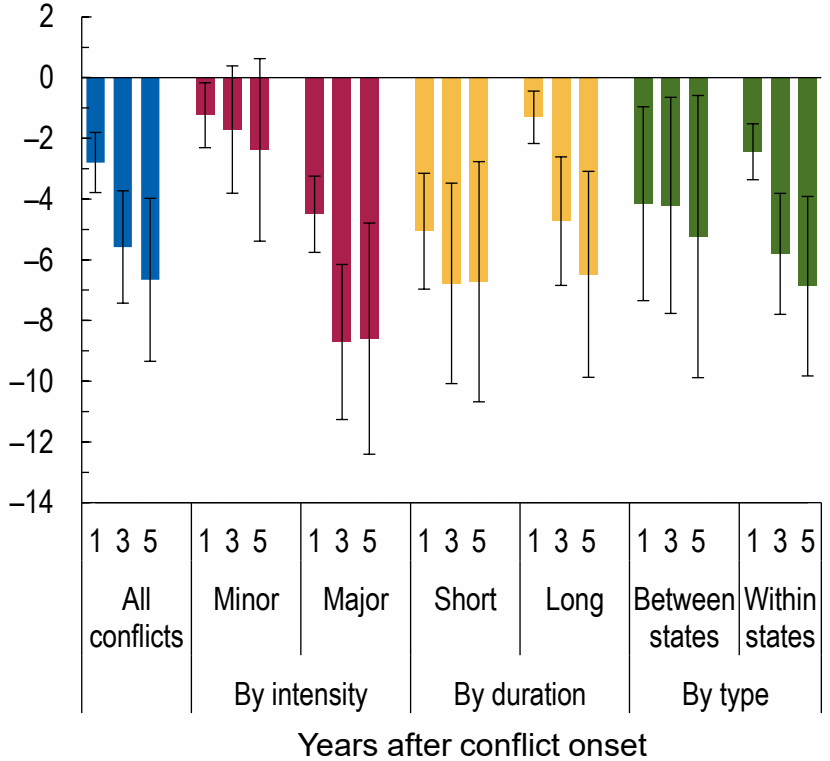
Impact of Conflict on GDP
(Percent)



Comparison to Other Shocks
(Percent)



Heterogeneity by Conflict Intensity, Duration, and Type
(Percent)



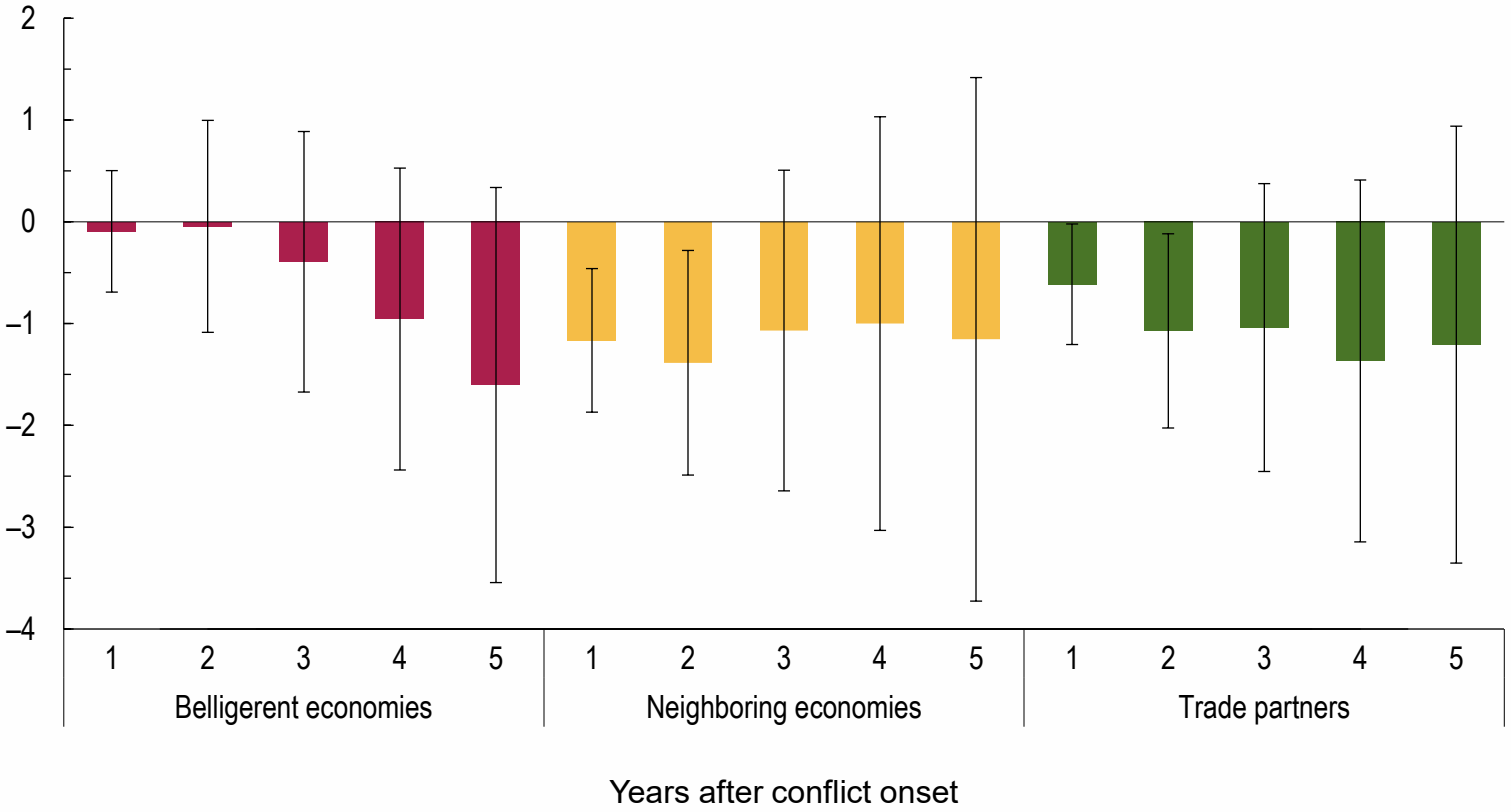
Source: IMF staff calculations.
Note: The figures report local projection differences-in-differences estimates of the effects of conflicts (and other shocks) on output cumulatively up to five years after conflict onset. In panel 1, the line denotes point estimates, and the shaded area denotes 90 percent confidence intervals. In panels 2 and 3, bars denote point estimates, and whiskers indicate 90 percent confidence intervals.

Spillovers to Third Countries

Belligerent economies are relatively protected, but neighboring economies and trade partners face temporary output losses.

Output Cost Spillovers from Major Conflicts

(Percent)



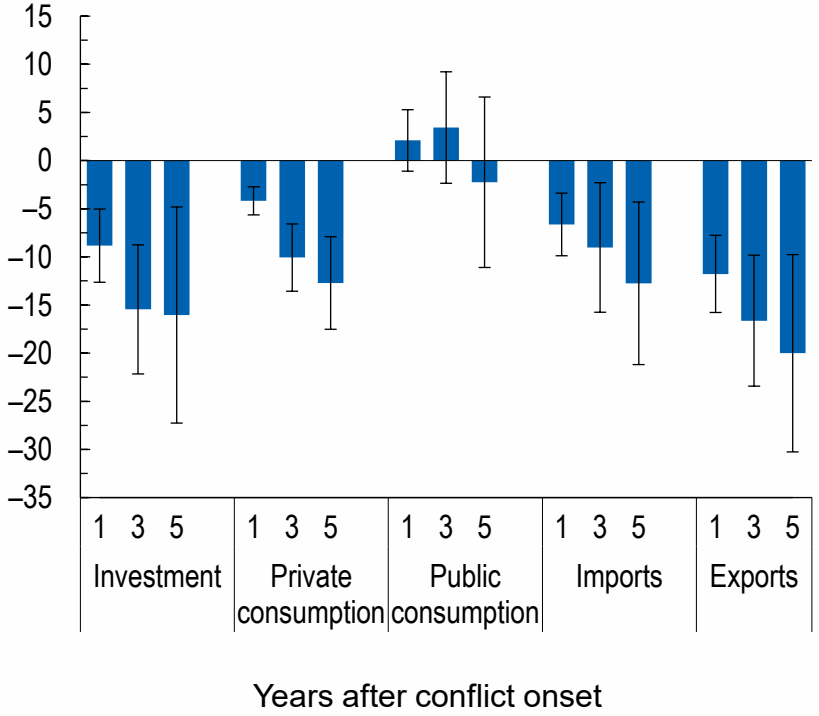
Source: IMF staff calculations.

Note: The figure shows local-projection difference-in-differences estimates of the spillover effects of major conflicts on output in belligerent economies and third countries (neighbors and trading partners) up to five years (shown on the horizontal axis) after conflict onset. Trade partners are defined as countries whose share of imports from conflict-site economies exceeds the 90th percentile of the distribution. Bars denote point estimates, and whiskers indicate 90 percent confidence intervals.

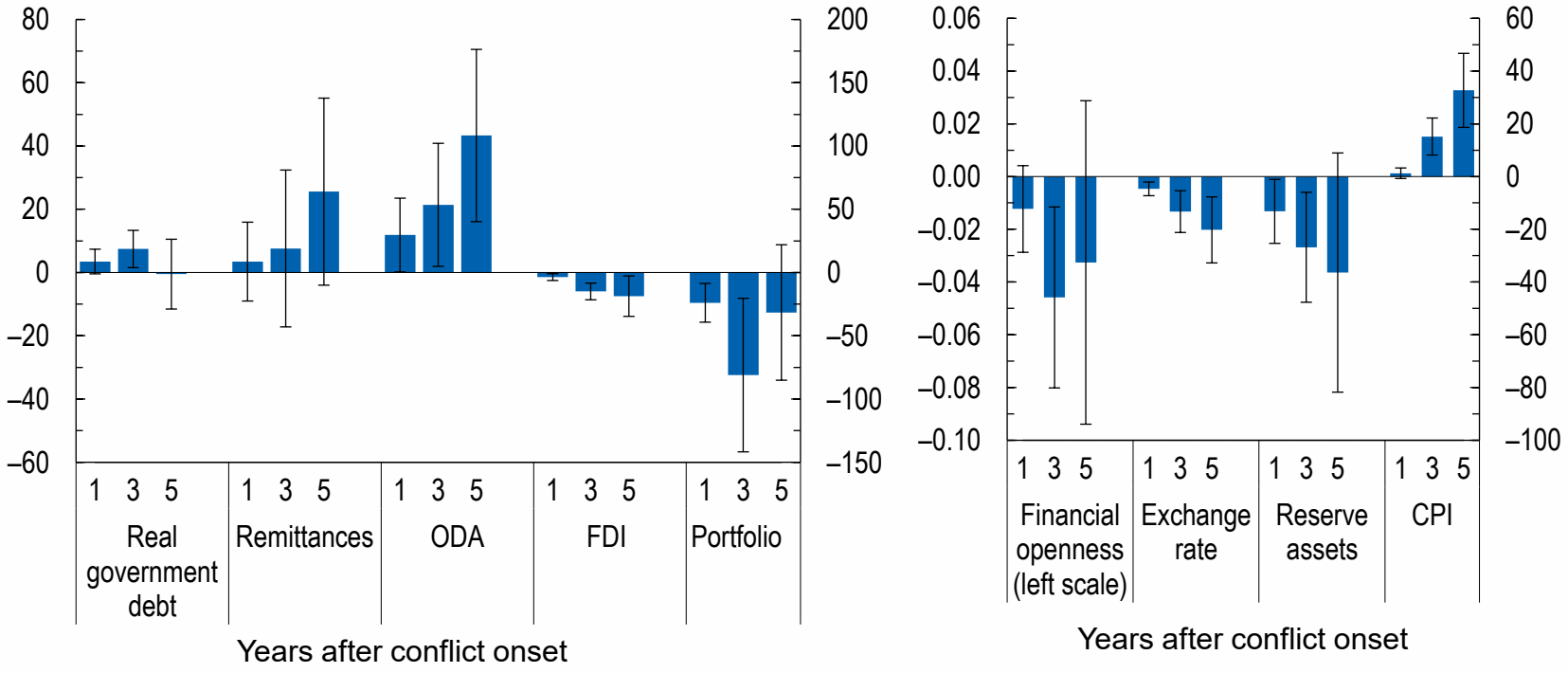
Macroeconomic Trade-offs for Conflict-Site Economies

Macroeconomic trade-offs in conflict-site economies are acute across fiscal, monetary, and external sector dynamics.

Demand-side of Output
(Percent)



Macroeconomic Vulnerabilities
(Percent)



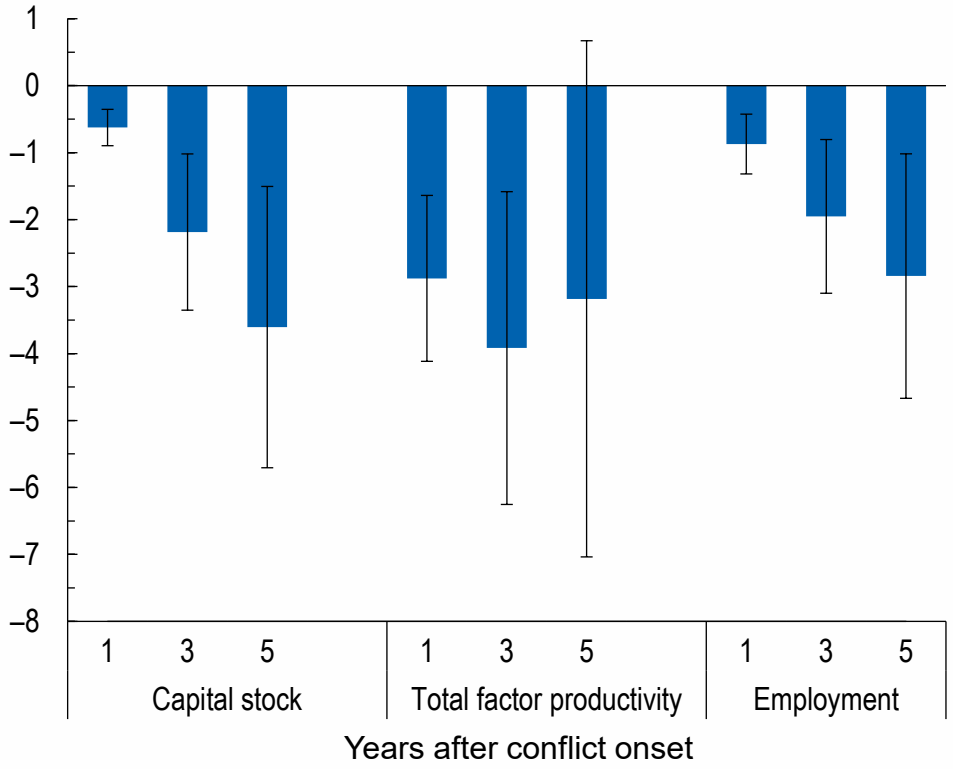
Source: IMF staff calculations.
Note: The figures report local-projection difference-in-differences estimates of the effects of major conflicts in conflict-site economies on a set of macroeconomic variables up to five years (shown on the horizontal axis) after conflict onset. Bars denote point estimates, and whiskers indicate 90 percent confidence intervals. CPI = consumer price index; FDI = foreign direct investment; ODA = official development aid.

Scarring Effects on the Macro and Individuals

Conflicts leave deep macroeconomic scars on production factors, alongside adverse long-term health effects.

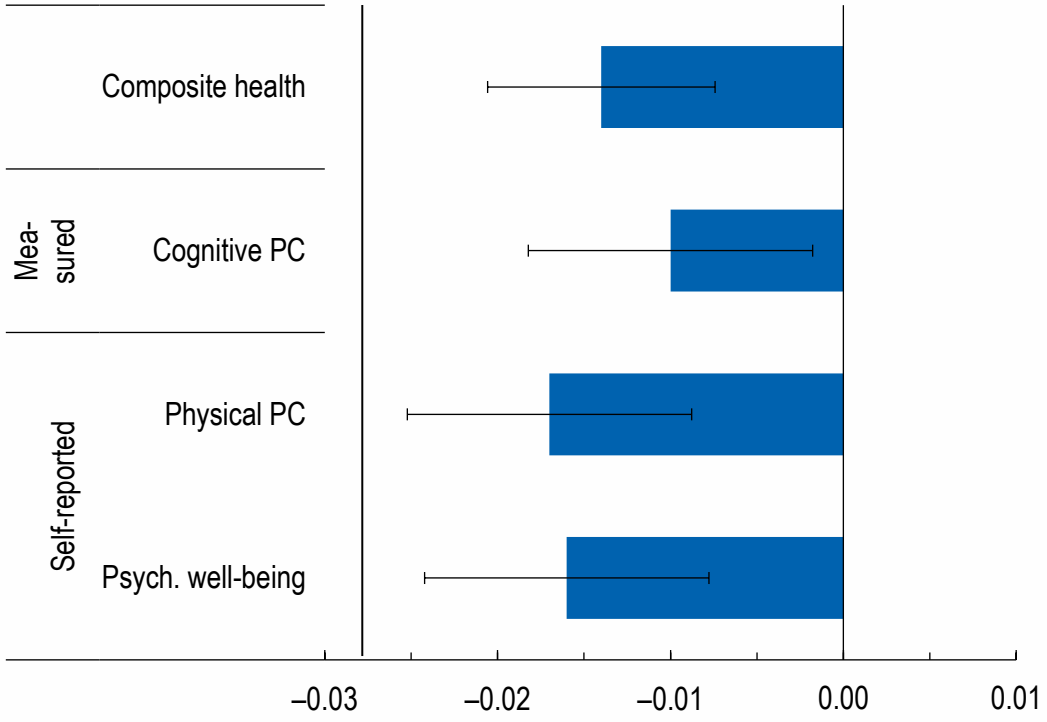
Macroeconomic Scarring

(Percent)



Scarring Effects on Older Individuals' Health

(*Coefficient on years-lived-in-conflict*)



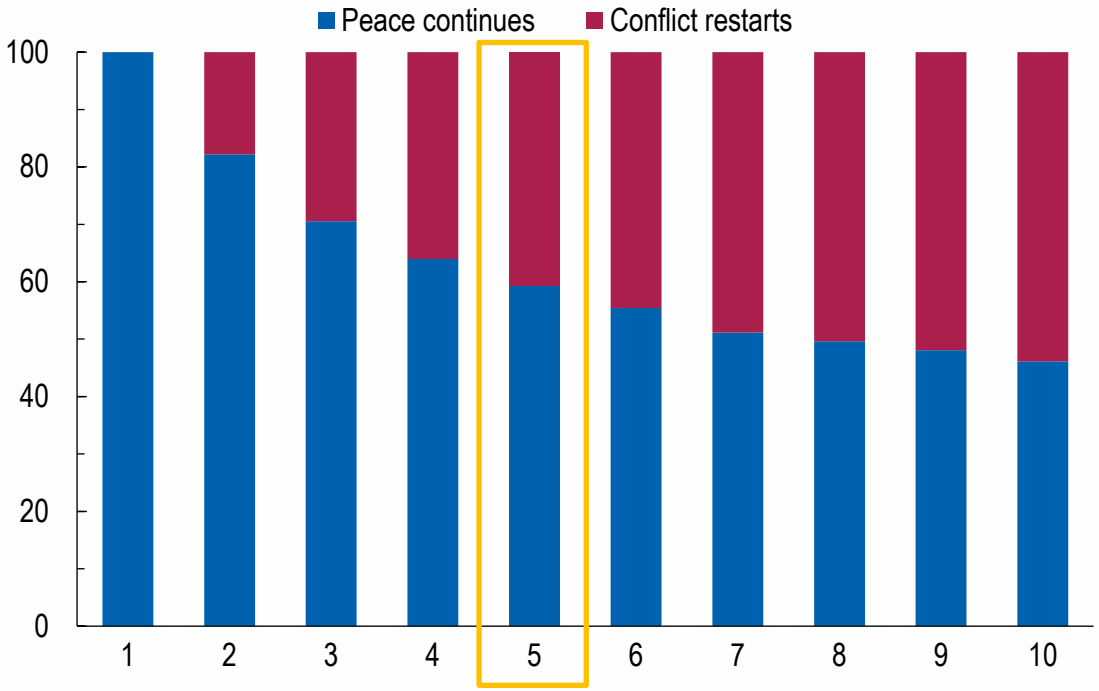
Source: IMF staff calculations.
Note: Panel 1 reports local-projection difference-in-differences (LP-DiD) estimates of the effect of major conflicts on production factors up to five years (shown on the horizontal axis) after conflict onset. Panel 2 shows the effect of major conflicts on mortality using the same approach. Panel 3 reports coefficients from ordinary least squares regressions of standardized health indicators (mean 0, standard deviation 1) on the number of years an individual lived in conflict. "Cognitive PC" is the principal component of verbal fluency, orientation, memory, and basic numeracy. "Physical PC" is the principal component of activities of daily living (ADLs), instrumental ADLs, pain frequency, and hearing ability. Psych. well-being is psychological well-being. "Composite health" averages all health measures. Bars denote point estimates, and whiskers indicate 90 percent confidence intervals.

Postconflict Recovery

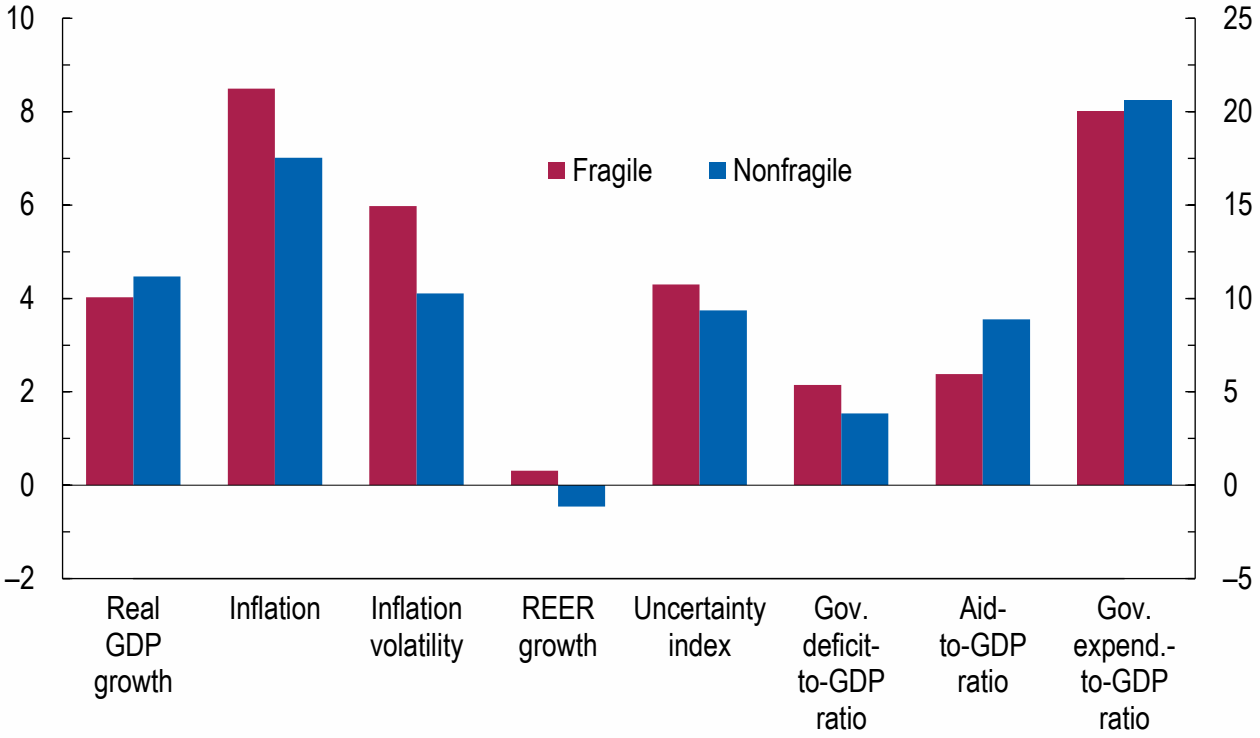
How Long Does Peace Last After Conflict?

In many post-WWII post-conflict cases, peace remains fragile, and relapse risk is endogenous to economic policies.

Peace Duration
(Percent of peace episodes)



Macroeconomic Correlates of Fragile Peace
(Percent)

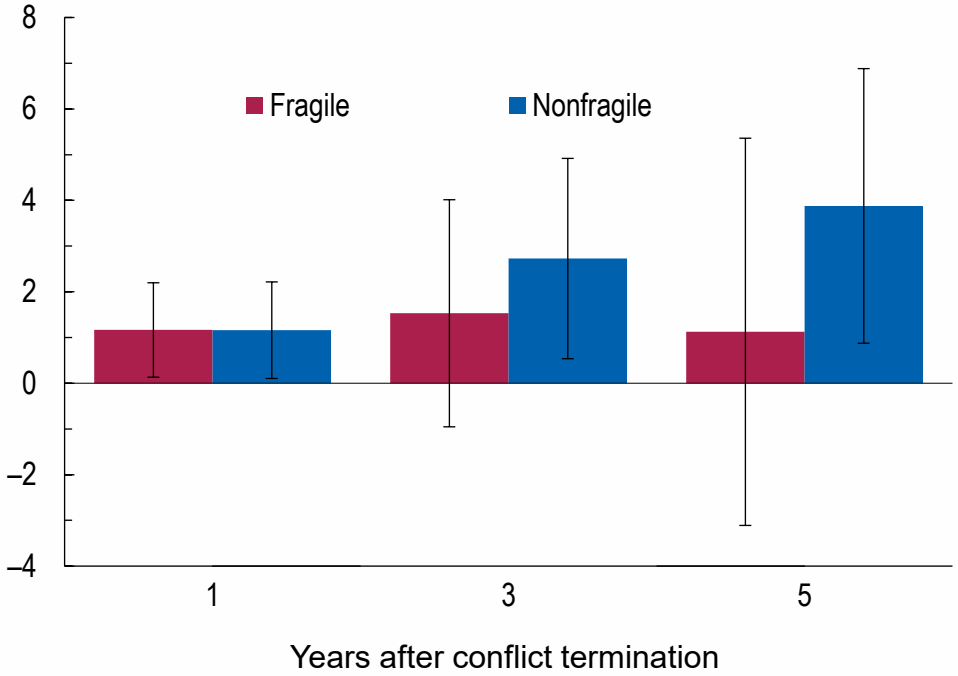


Source: IMF staff calculations.
Note: Panel 1 shows the share of postconflict episodes in which economies remain at peace or relapse into conflict over a 10-year horizon during the period 1946–2015, with the first year of peace normalized to 100 percent. Panel 2 reports the sample average of key macroeconomic variables in fragile and nonfragile episodes. Fragile episodes refers to conflict terminations followed by a relapse into conflict within five years, whereas nonfragile episodes are those in which peace persists for at least five years. Gov. expend. = government expenditure; REER = real effective exchange rate.

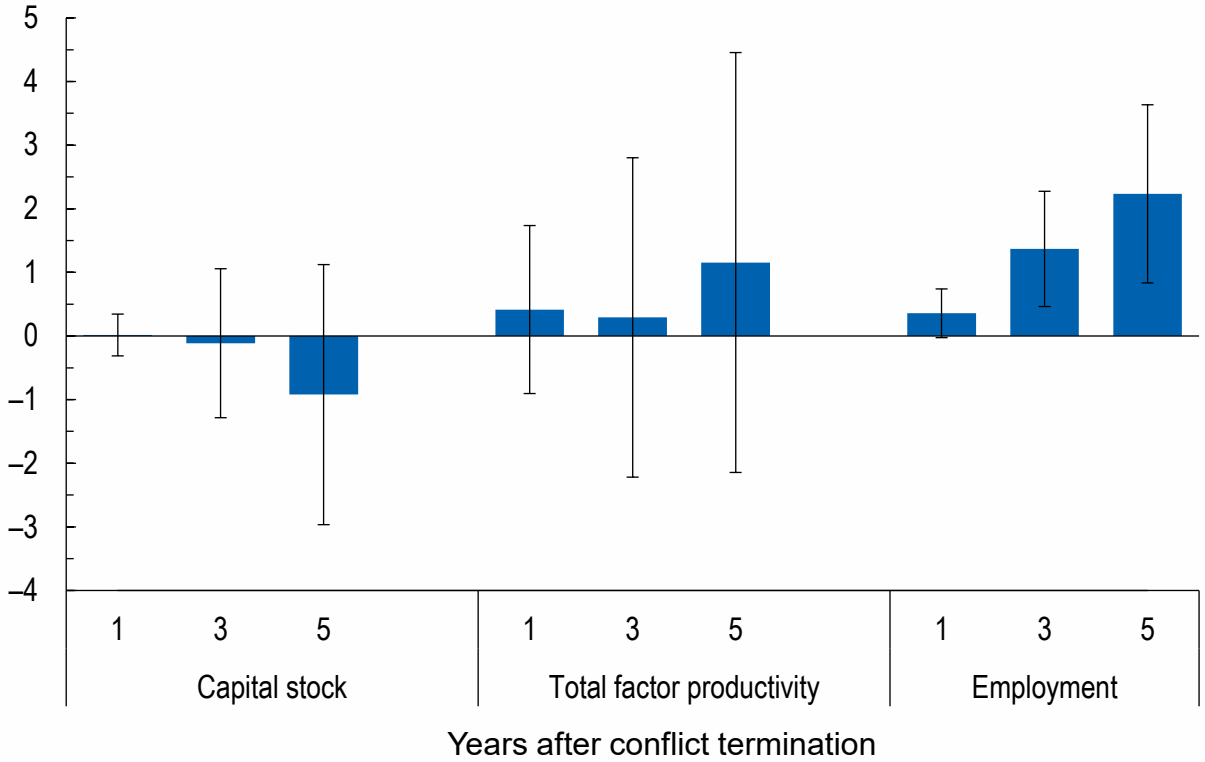
Labor-led Recovery Depends on Stable Peace

Output fails to recover in fragile cases; when sustained, recovery is slow and uneven and primarily driven by labor.

Output
(Percent)



Supply-side of Output
(Percent)



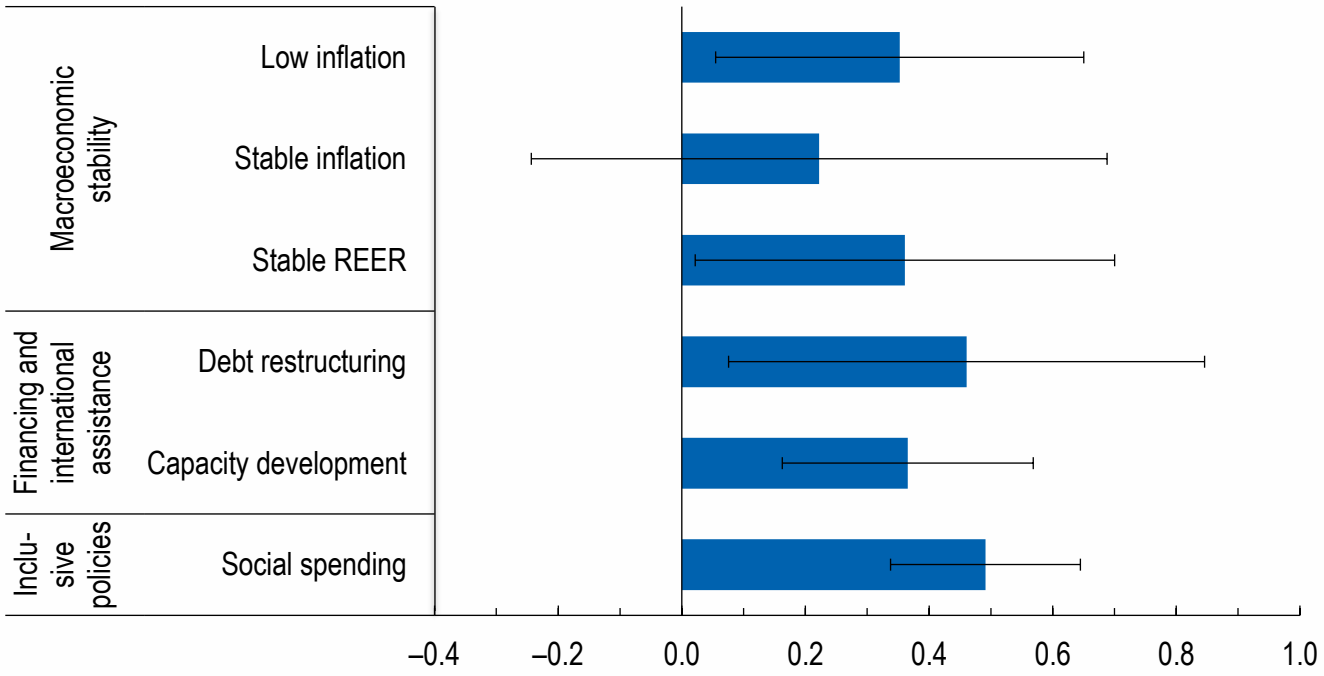
Source: IMF staff calculations.
Note: The figures estimate the effects of conflict termination on selected macroeconomic outcomes in post-conflict-site economies using a local projection difference-in-differences approach. Conflict termination is defined as battle-related deaths falling below the chapter's baseline threshold of 25 per calendar year and remaining below that level for at least five consecutive years. Fragile denotes conflict termination cases where conflict restarted within 5 years; not fragile are cases where peace persisted for at least 5 years. Shaded areas denote point estimates and error bars indicate 90 percent confidence intervals. CPI = consumer price index; TFP = total factor productivity.

What Policies Matter for a Successful Recovery?

Macroeconomic stability, international support, and inclusive policies underpin stronger recoveries.

Correlates of Post-conflict Recovery

(*Coefficient on percentile distribution of growth*)



Source: IMF staff calculations.

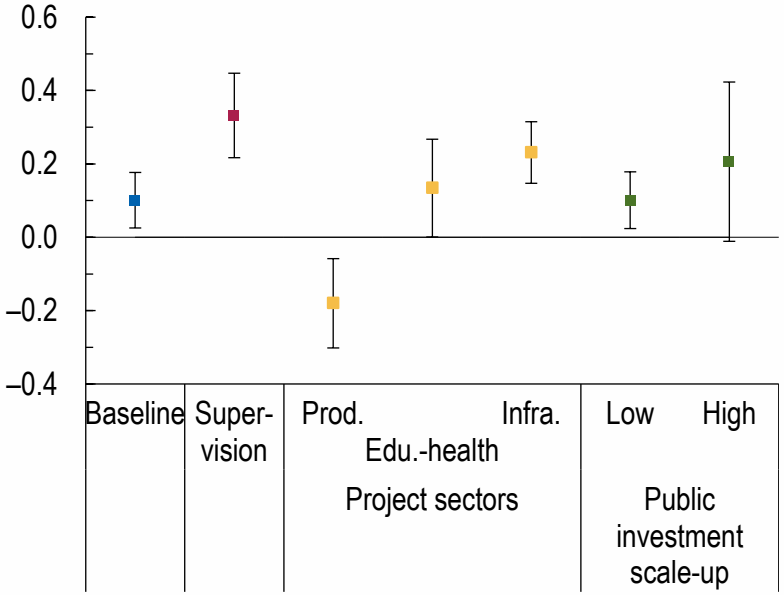
Note: The figure shows policy correlates of the distribution of growth outcomes over the first five years of postconflict recovery. The dependent variable is the percentile of the growth distribution at each horizon (t = 1–5 years). Regressions control for postconflict episode and horizon fixed effects. “Low inflation”, “stable inflation,” and “stable REER” are indicator variables equal to one if the respective measure falls below the sample mean, based on inflation levels, inflation volatility, and REER volatility. “Debt restructuring” equals one if a restructuring occurs. “Capacity development” is measured by the log number of participants in IMF training. Bars denote point estimates, and whiskers indicate 90 percent confidence intervals. REER = real effective exchange rate.

Aid and Governance Are Critical for Postconflict Recovery

Aid-funded development projects can support recovery, but effectiveness depends critically on context and implementation.

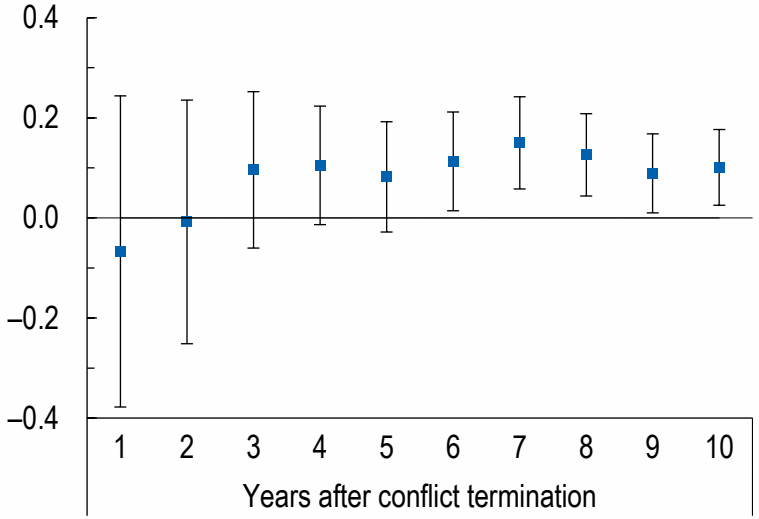
Project Outcome after Conflicts

(Regression estimates, coefficient)



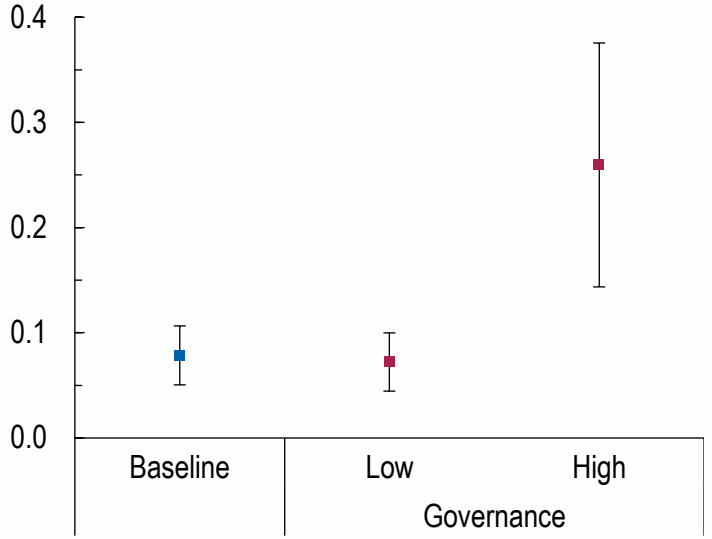
Time-varying Effects on Project Outcome

(Regression estimates, coefficient)



Subnational Growth, Aid and Local Governance after Conflicts

(Regression estimates, coefficient)

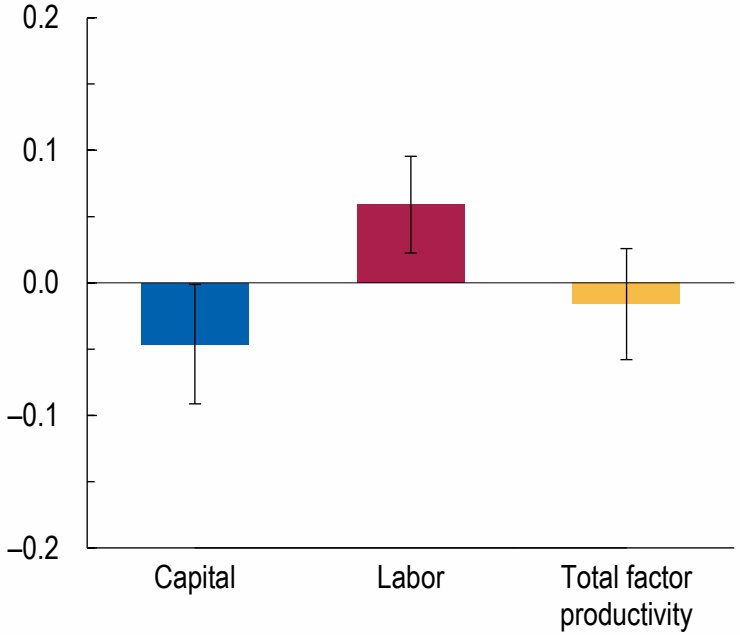


Source: IMF staff calculations.
Note: Panels 1 and 2 show the effect of postconflict peace on project outcomes, measured on a 1–6 Likert scale, using a difference-in-differences approach. Panel 3 shows the marginal postconflict effect, conditional on aid, on nightime light intensity for administrative regions at the second subnational levels (ADM2). Data on project outcomes are drawn from Honig, Lall, and Parks (2023); subnational project data from Bomprezzi and others (2024); nightime light intensity data from Li and others (2020); and subnational governance data from Crombach and Smits (2024). Markers denote point estimates; whiskers show 90 percent confidence intervals. Edu.-health = education and health; Infra. = infrastructure; Prod. = productive sectors.

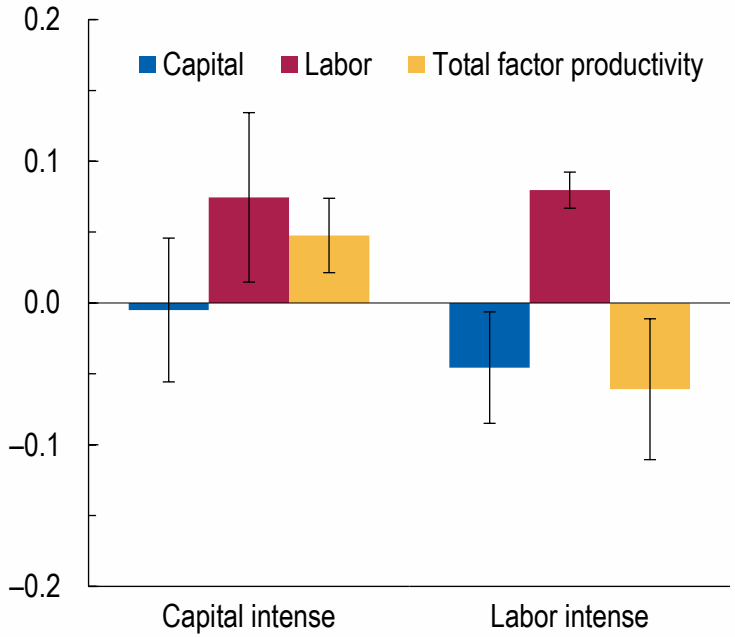
Labor-led Recovery Driven by Stronger Firms

Surviving firms expand employment, but gains in capital and productivity remain weak, with heterogeneity across firms.

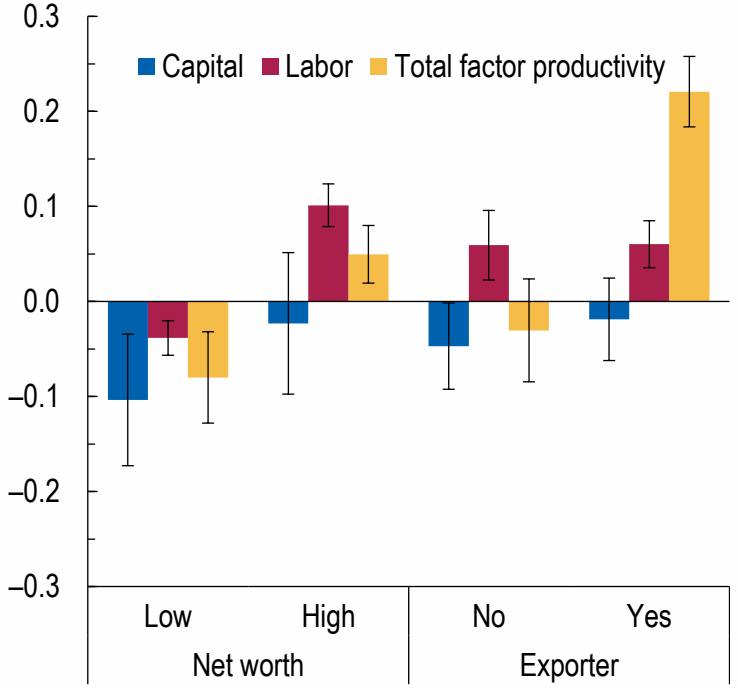
Baseline Estimates
(Percentage change)



Heterogeneity by Factor Intensity
(Percentage change)



Heterogeneity by Firm Characteristics
(Percentage change)

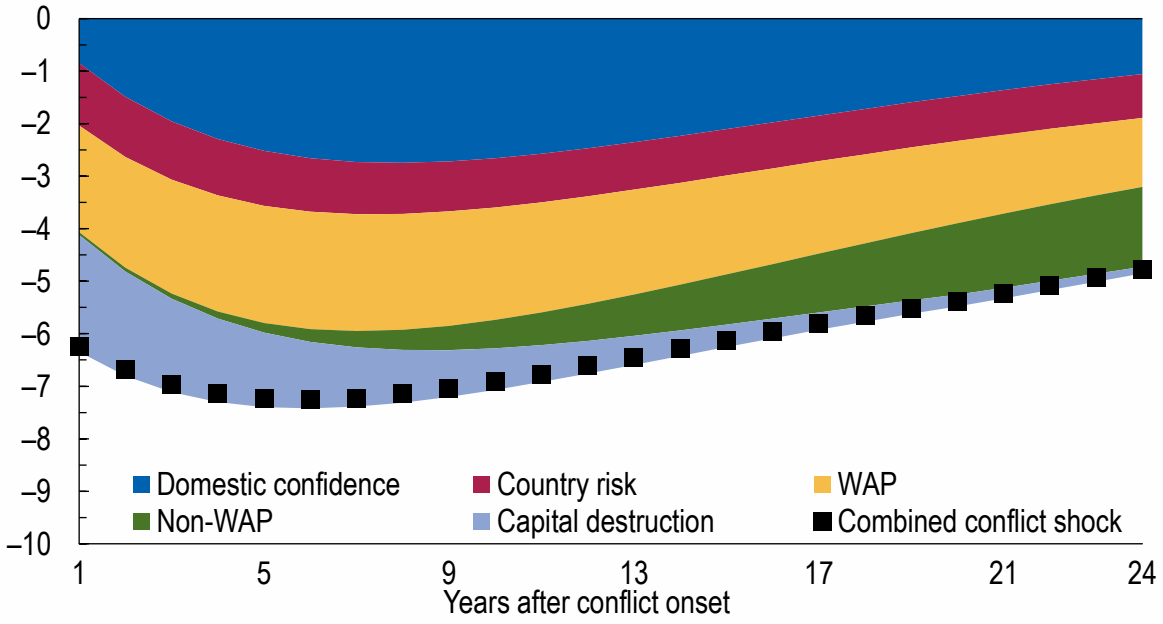


Source: IMF staff calculations.
Note: The panels show ordinary least squares estimates of the effects of postconflict peace on firm dynamics. The dependent variables are firm-level capital, labor, and total factor productivity (TFP, measured as quantity-based TFP or TFPQ), all in logarithms. The key explanatory variable is a postconflict peace dummy equal to 1 during the five years following a conflict episode within a 20-kilometer radius of a firm's location. Depending on the specification, regressions control for firm age, size, leverage, and export status, and include firm, country-year, and sector-year fixed effects. Firm-level data come from Orbis. Bars denote point estimates, and whiskers show 90 percent confidence intervals.

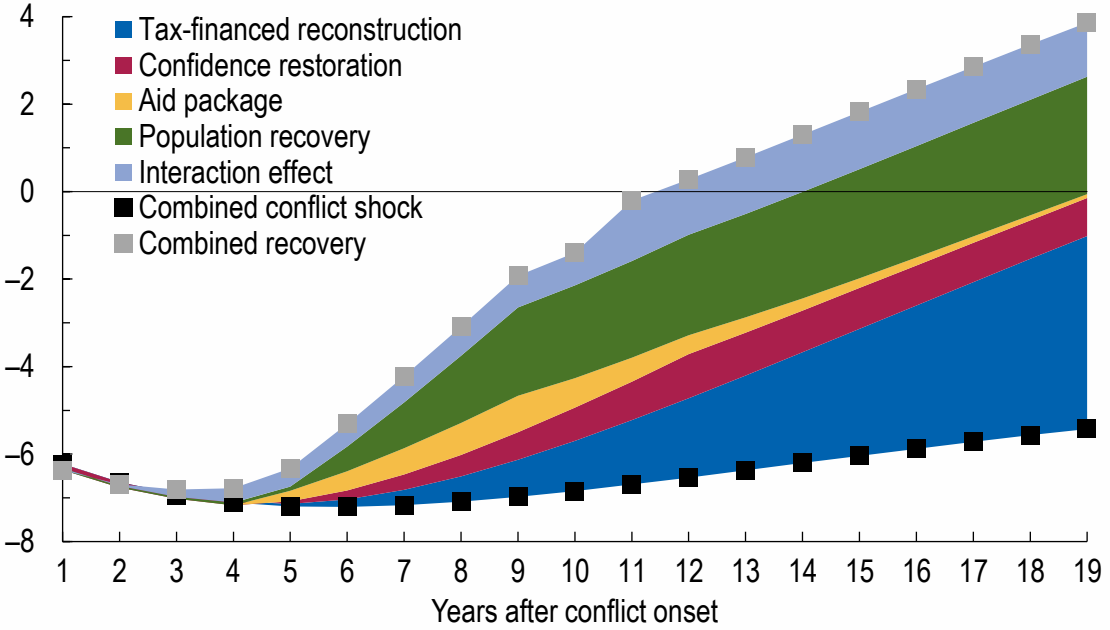
Model-based Simulations: Conflict Shock and Recovery

Conflicts cause large output losses; stronger recoveries requires comprehensive and well-coordinated policy packages.

Contribution to Changes in Output after Conflict Shock
(Deviation from baseline scenario, percentage points)



Output Dividends from Recovery Policies
(Deviation from baseline, percentage points)



Source: IMF staff calculations.
Note: In panel 1, "combined conflict shock" denotes the joint effect of the conflict shocks. Panel 2 shows model-based simulations of the effect of recovery policies on output up to 19 years (shown on the horizontal axis) after conflict onset. "Combined recovery" denotes the joint effect of the recovery policies. "Interaction effect" reflects the output gains from policy externalities, complementarities across policies, and improved expectations. "Tax-financed reconstruction" raises public spending by three percentage points over 15 years. "Aid package" amounts to 0.5 percent of GDP over five years. "Confidence restoration" fully undoes the confidence shocks. "Population recovery" assumes a gradual return of refugees. WAP = working-age population, defined as 19 to 59.

Conclusions

Key Takeaways

Conflicts have increased in recent years, reaching historically high levels

- The increase is driven primarily by **within states conflicts**, through **between states have also edged up** in recent years
- Conflicts are **unevenly distributed geographically**, with high concentration in the Middle East and sub-Saharan Africa

Macroeconomic dynamics during conflict

- Conflicts generate **large and persistent output losses**, exceeding losses from major financial crises or natural disasters
- Adverse effects vary by **conflict type, intensity and duration**; and **spill over to other countries**
- **Macroeconomic trade-offs are acute**, leaving **lasting scars** on both the macroeconomy and individuals

Macroeconomic dynamics after conflict ends

- Post-WWII conflicts' economic recoveries are typically **slow and uneven and labor-led**
- Policies can make a difference during the recovery, including:
  - **Debt restructuring** to restore fiscal sustainability
  - **Macroeconomic stabilization** to restore low and stable inflation, and a stable exchange rate
  - **International support**, including aid, debt restructuring and capacity development
  - **Complementary domestic policies** to rebuild institutions and state capacity, promote inclusion, mitigate human capital losses
- A faster recovery requires **comprehensive and well coordinated policy packages**