WESTERN HEMISPHERE DEPARTMENT

The Macroeconomic Effects of Social Unrest

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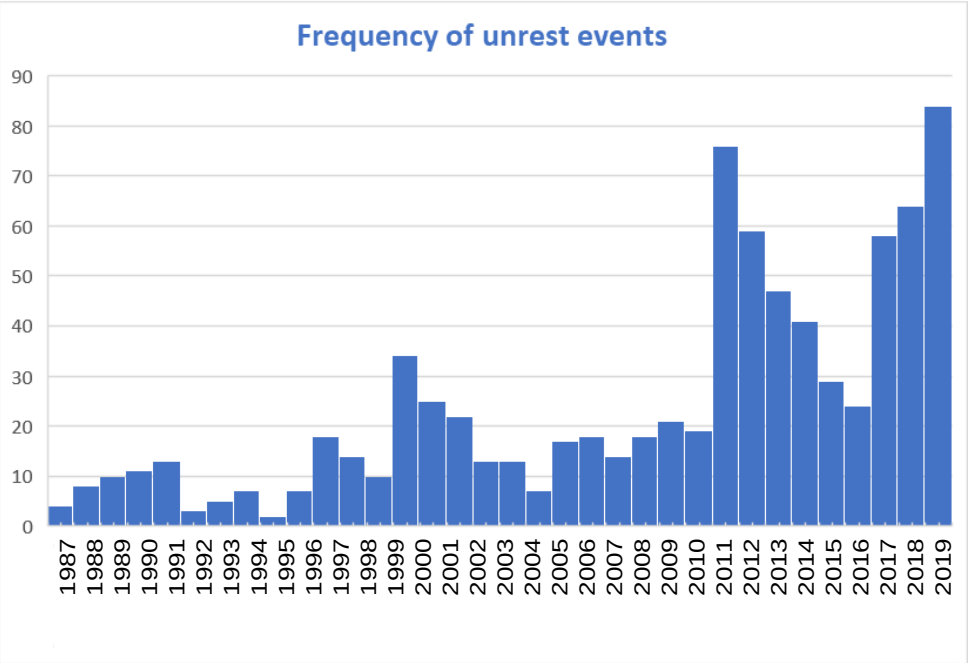
Motivation and Literature

Motivation: the issue

- **Social unrest has been increasing in recent years:**
  - Frequency of severe social protests has increased recently, affecting diverse places from France and Hong Kong in AEs to Chile and Lebanon in EMs, among others in 2019
  - The latest Global Peace Index (2020) suggests that the number of riots, general strikes and anti-government demonstrations around the world increased by 244 per cent over the last decade (2011 to 2019)



Source: Authors' calculations based on Barrett, Appendino, Nguyen and de Leon Miranda (2020).

- **Social unrest is likely to pick up again after the pandemic** due to the adverse impact on inequality and poverty (Furceri, Loungani, Ostry, and Pizzuto, 2020; Ahmed, Ahmed, Pissarides, and Stiglitz, 2020)

- **Studies on macroeconomic effects of social unrest are limited** (more on large conflicts)
  - Conflicts are a key hurdle to economic growth (Rodrik, 1999), produce persistent negative effects on output (Cerra and Saxena, 2008; IMF, 2019; Rother et al. 2016), and result in large overall macroeconomic costs (Novta and Pugacheva, 2020)
  - Unrest usually an element of broader political instability that negatively affects growth (Alesina et al. 1996; Aisen and Veiga, 2013; Jong-A-Pin, 2009)
  - Recent IMF work: Saadi Sedik and Xu (2020); Hlatshwayo and Redl (2020); Barrett et al. (2020)

Motivation: what we do

- We leverage on a novel index.
  - Barrett, Appendino, Nguyen and de Leon Miranda (2020).
  - Timely, transparent, high-frequency indicator with broad and consistent cross-country coverage based on counts in relevant media reports.
  - Compared to existing indicators, it provides higher frequency (than CNTSD, annual) and broader coverage (than ACLED, mainly SSA) with more objectivity and replicability (than ICRG, subjective assessment).

- We thus investigate the macroeconomic impact considering:
  - a broader pool of social events, including less severe than civil conflicts (compared to the literature looking at the economic costs of conflicts);
  - impact also on higher frequency indicators;
  - demand & supply components;

Preview

- *Economic activity declines following spikes in the unrest index, with GDP remaining on average ¼ pp below the pre-shock baseline after 6 quarters.*

- *Adverse effect on GDP is driven by sharp contractions of services and manufacturing (sectoral decomposition) and consumption (demand decomposition).*

- *Social unrest lowers confidence, raises uncertainty, albeit its adverse economic effects can be dampened by strong institutions and policy space.*

- *Economic impact differs by type of unrest episodes:*

  mainly due to politics/elections < socio-economic reasons < both

- *Results are robust to controlling for previous adverse growth events*

Data and methodology

Data on unrest

- Social unrest data comes from Barrett, Appendino, Nguyen and de Leon Miranda (2020).
  - They propose a monthly news-based index starting in 1985m1 that quantifies social unrest for a large set of countries—the reported social unrest index (RSUI).
  - The primary source is Dow Jones' Factiva news aggregator. They restrict their sample to printed articles published in major English-language newspapers and networks (USA, CAN, UK).
  - The index takes the following form:

$$RSUI_{it}^{A} = \frac{x_{it}}{\frac{1}{12}\sum_{j=1}^{12} z_{t-j}} \times \frac{100}{\bar{x}_i/\bar{z}}$$

  - Where x_{it} is the article count related to unrest events in country *i* in month *t;* z_t is the article count in period *t;* $\bar{x}_i$ and $\bar{z}$ are the averages over all time periods.

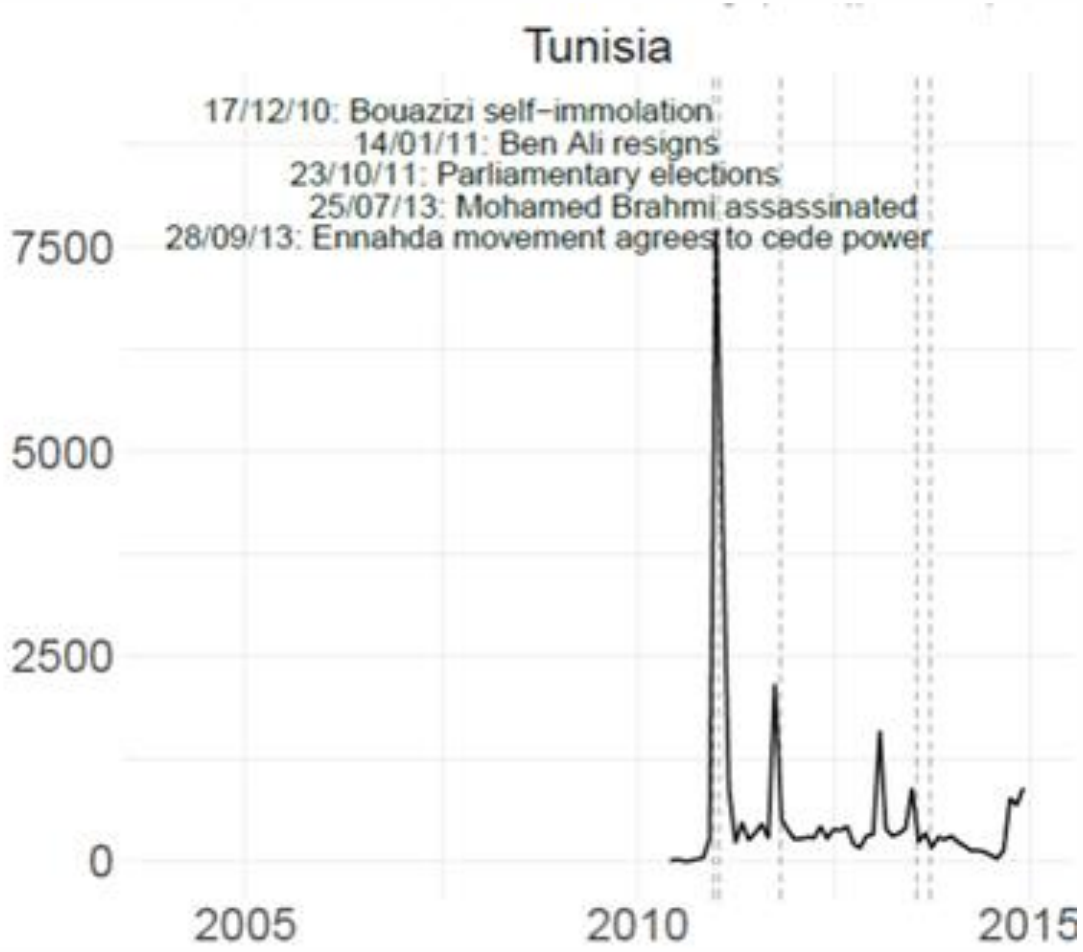
Data on unrest (II)

- To obtain the article counts, the authors apply the following search criteria:

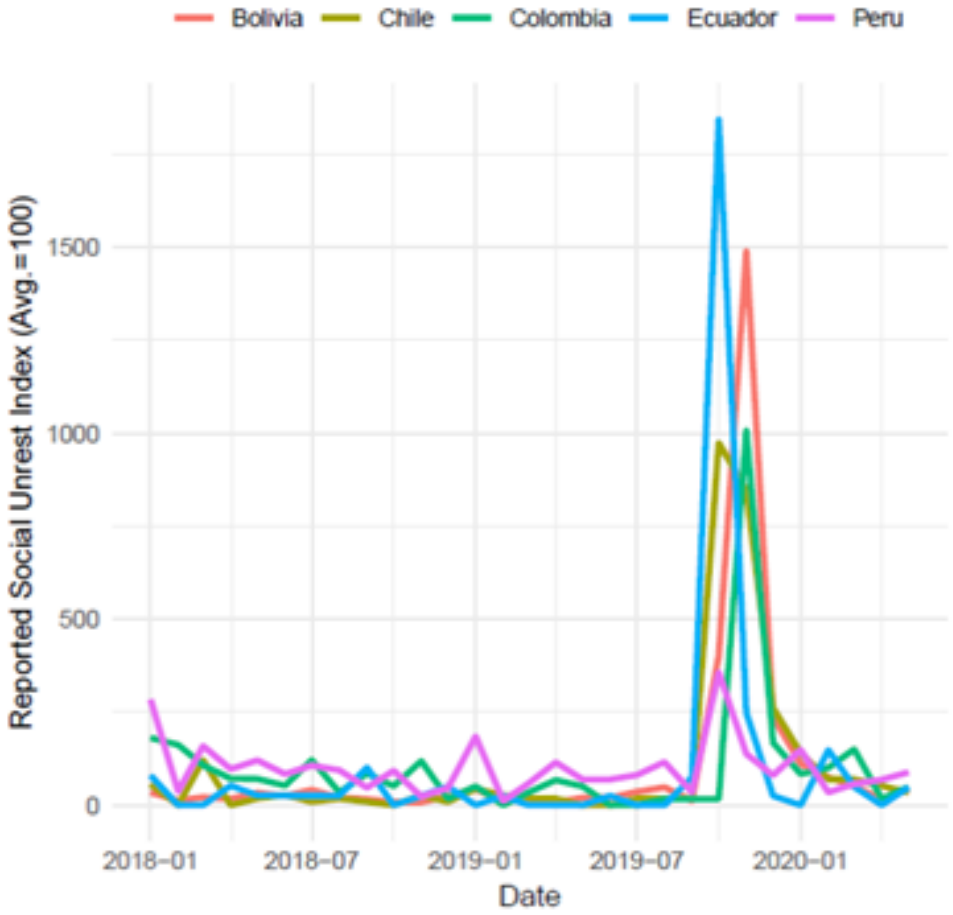
	x_{it}	y_{it}	z_t
Must include	Country name AND ("protest*" OR "riot*" OR "revolution" OR (("civil" or "domestic") within 10 words of "unrest")	Country Name AND "today"	"today"
Must exclude	Country-specific terms OR "vote of protest" OR "protest vote" OR "protestant*" OR "anniversary" OR "war" OR "memorial" OR "movie"		
Location tag	Country i	Country i	
Subject tag	Domestic Politics Or Civil Unrest		
Word count	100+	100+	100+

Table 1: Article search Criteria

RSUI



Source: Barrett et al. (2020).



Source: Barrett et al. (2020).

Data on unrest (III)

- In addition to constructing the index, the authors propose an algorithm to identify ***RSUI-implied events.***

- An ***RSUI-implied event*** has to satisfy the following three criteria:

1. It must be a local peak: $RSUI_{it} = max\{RSUI_{it+1}, RSUI_{it-1}\}$
2. The index satisfies one of the following:
   - $RSUI_{it} > \overline{RSUI_{it}} + (4 * sd(RSUI_{it}))$ or
   - $RSUI_{it}$ is in the top 2% or
   - $RSUI_{it}$ exceed the 20-year moving average by 4 times the 20-year st. dev.
3. The unrest article count for the month is at least 10 percent the average monthly count for the country over the past 12 months.

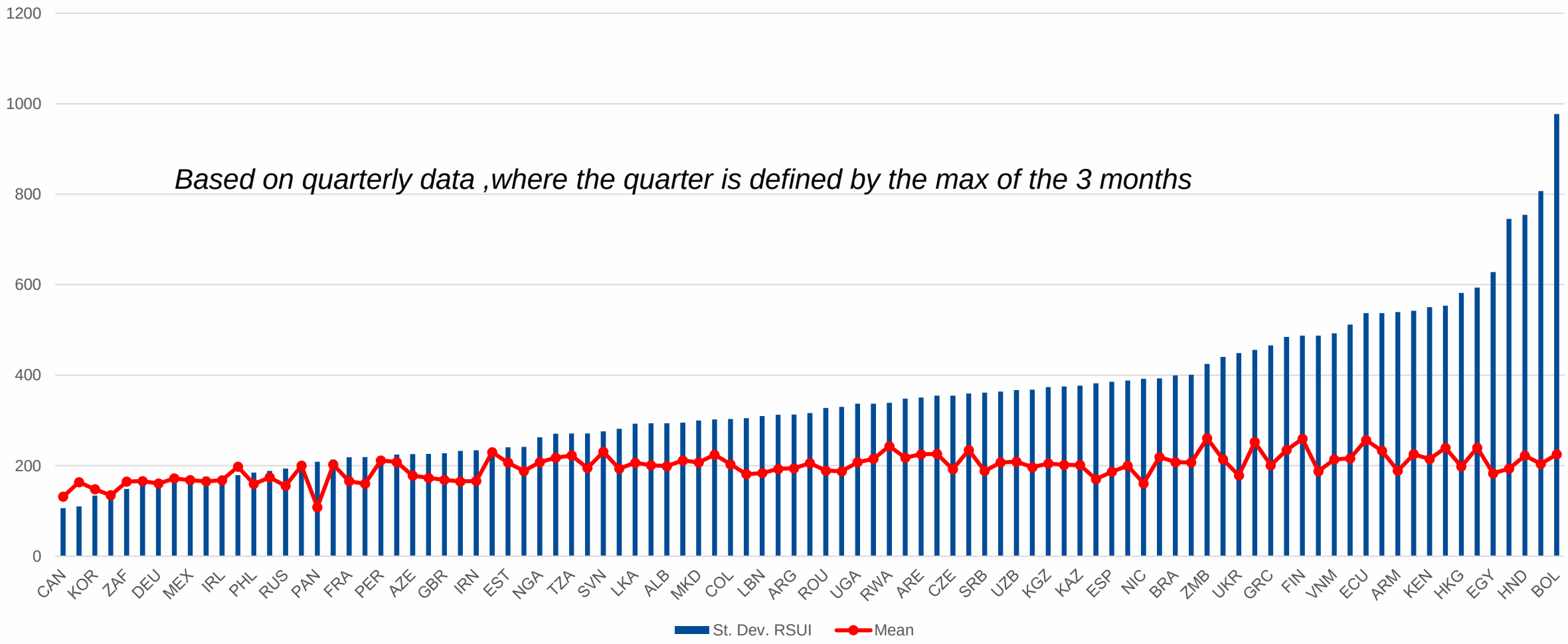
- We label an event satisfying all five criteria as a ***major event.***

Data on unrest (IV)

- In the empirical analysis we use the dataset constructed by Barrett, Appendino, Nguyen and de Leon Miranda (2020) as follows:
  - For each country, we aggregate the **social unrest index** (RSUI) at the quarterly level by taking the maximum level over the quarter.
  - We also aggregate the **RSUI-implied event** dummy constructed by the authors and the **major event dummy** at the quarterly level (taking the maximum over the quarter) and focus on **new** events—events that are at least 8 quarters apart from each other.
  - We will use both the index and the event, in separate exercises
  - Based on the event's main underlying cause/trigger, we distinguish between 3 types:

    (1) Political/elections ***(2) Socio-economic*** ***(3) Mixed***

Volatility of RSUI varies substantially across countries



Macroeconomic data and sample

- We include all 96 countries with both RSUI and quarterly GDP data over the period 1990-2018, excluding fragile states.
  - Quarterly GDP and other NA accounts data comes from national sources (SA by authorities if available, otherwise we use Haver for SA).
  - Debt/GDP comes from the Fiscal Monitor database.
  - Rule of law estimates come from the World Governance Indicators (Kaufmann, Kraay, and Mastruzzi, 2010)
  - Data on exchange rate regimes comes from Ilzetzki, Reinhart and Rogoff (2019).
  - Data for confidence indicators, monthly economic activity and industrial production are from Haver.
  - Data on uncertainty comes from the latest vintage of the World Uncertainty Index proposed by Ahir, Bloom and Furceri (2018).
  - Excluded fragile states as defined by the World Bank in at least one year since 2006.

Macroeconomic data and sample

Advanced economies (33):

Australia, Austria, Belgium, Canada, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Netherlands, New Zealand, Norway, Portugal, Singapore, Slovakia, Slovenia, Spain, Sweden, Switzerland, Taiwan PoC, UK, United States

Emerging Mkts and Low-income Countries (63):

Albania, Algeria, Argentina, Armenia, Azerbaijan, Bahrain, Bangladesh, Bolivia, Brazil, Bulgaria, Burkina Faso, Chile, China, Colombia, Croatia, Ecuador, Egypt, Ethiopia, Ghana, Guatemala, Honduras, Hungary, India, Indonesia, Iran, Jordan, Kazakhstan, Kenya, Kuwait, Kyrgyz Republic, Macedonia, Malaysia, Mexico, Moldova, Montenegro, Morocco, Nicaragua, Niger, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Qatar, Romania, Russia, Rwanda, Saudi Arabia, Senegal, Serbia, South Africa, Sri Lanka, Tanzania, Thailand, Tunisia, Turkey, Uganda, Ukraine, United Arab Emirates, Venezuela, Vietnam, Zambia

Econometric approach

- We assess the macroeconomic impact of episodes of social unrest using the local projection method proposed by Jordà (2005) and Teulings and Zubanov (2014).

- The procedure does not constrain the shape of the impulse response functions and is less sensitive to misspecification than estimates of VAR models.

- The benchmark specification at a quarterly frequency is as follows:

$$y_{i,t+h} - y_{i,t-1} = \alpha_i^h + \gamma_t^h + \beta^h \text{unrest}_{i,t} + \delta X_{i,t} + \varepsilon_{i,t+h}$$

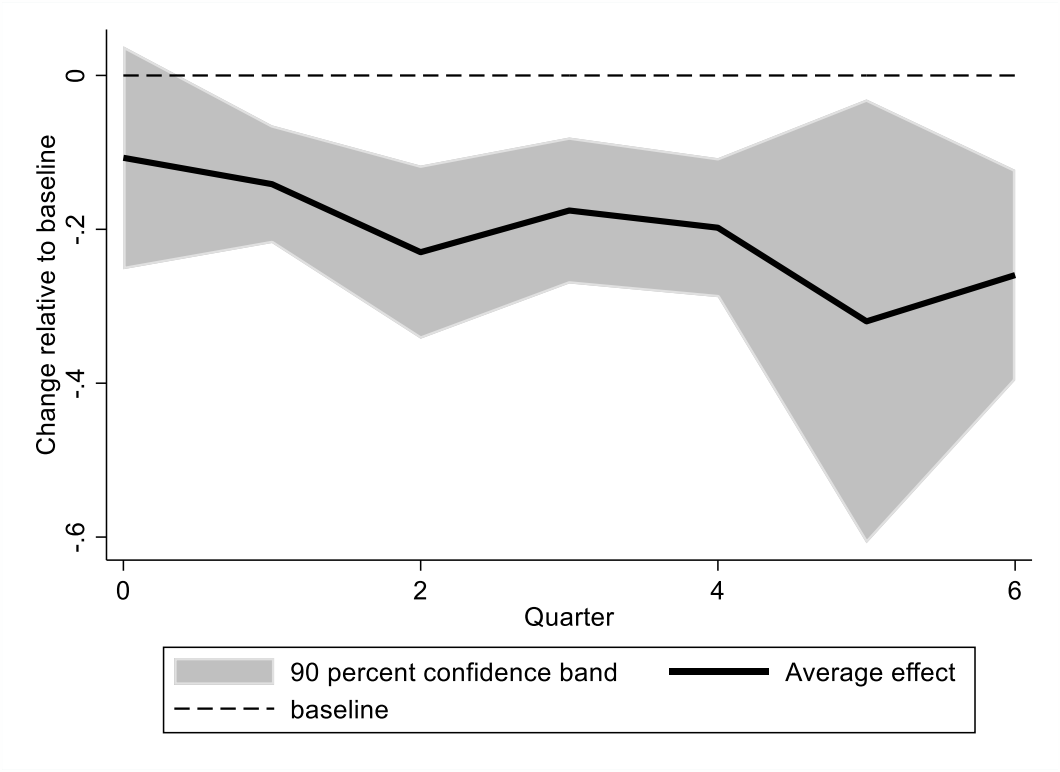
- y is the variable of interest (GDP, sectoral value added, demand components, confidence); **unrest is either the index proposed by Barrett et al. 2020 (RSUI) or the event dummy**; and X are a set of controls that includes past values of the dependent variable and past and future values of the shock (in the case of regressions using the RSUI).

- One of the main advantages of the LP method in estimating the effects of shocks is its flexibility in dealing with non-linearities and state dependency (Ramey and Zubairy, 2018).

Results: Impact of RSUI

GDP declines following spikes in the unrest index

GDP
Response to a one st.dev. to the unrest index

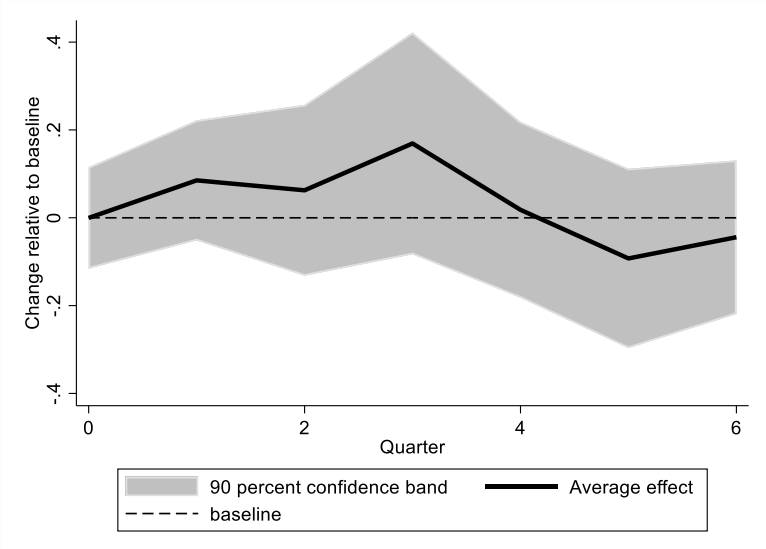


Standard errors are clustered at the country level.

- *GDP experiences a steady decline following a shock of one standard deviation in the unrest index.*
- *GDP declines by -0.1 percentage points qoq on impact.*
- *After 6 quarters, quarterly GDP remains .25 percentage points below its pre-shock level.*
- *A shock of one standard deviation is equivalent to the protests following the Peña Nieto election in 2012 or Chile's presidential election protests in 2013.*
- *For comparison, the protests of July 2019 in HKG and the yellow vest protests of 2018 in France resulted in an increase of 4 st.dev. in RSUI, while the events of Oct/Nov 2019 in Chile resulted in a 10 st.dev. increase in RSUI.*

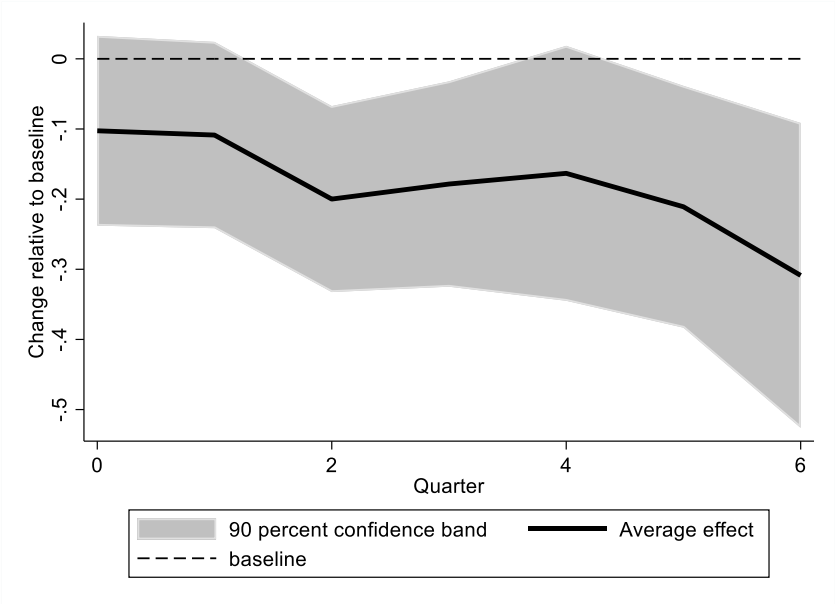
The adverse effects on GDP appear to be driven by a sharp contraction in manufacturing and services

Agriculture
Response to a one st.dev. to the unrest index



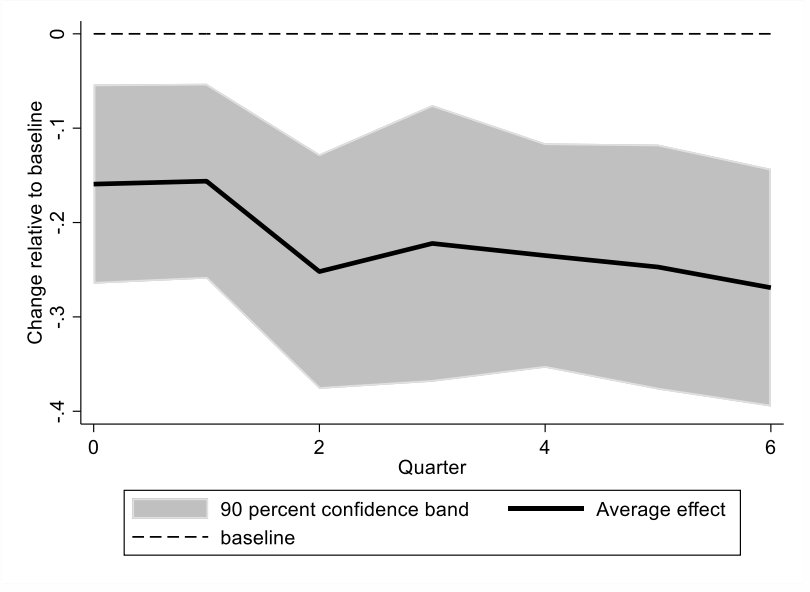
Standard errors are clustered at the country level.

Manufacturing
Response to a one st.dev. to the unrest index



Standard errors are clustered at the country level.

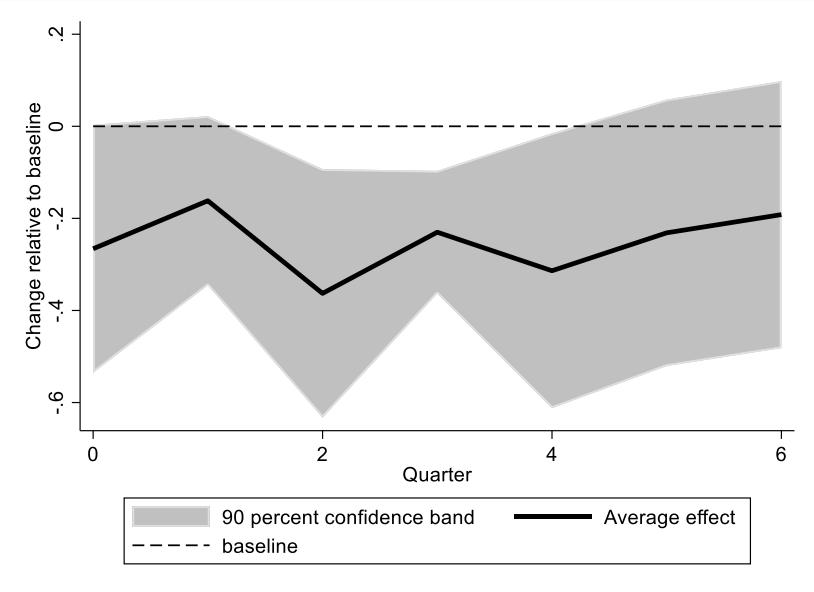
Services
Response to a one st.dev. to the unrest index



Standard errors are clustered at the country level.

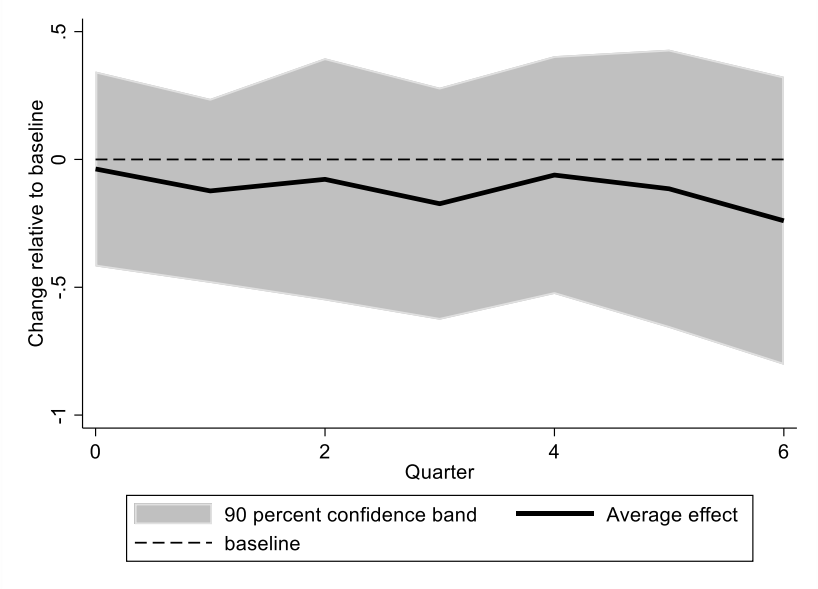
On the demand side, the effect of unrest is more evident on consumption

Consumption
Response to a one st.dev. to the unrest index



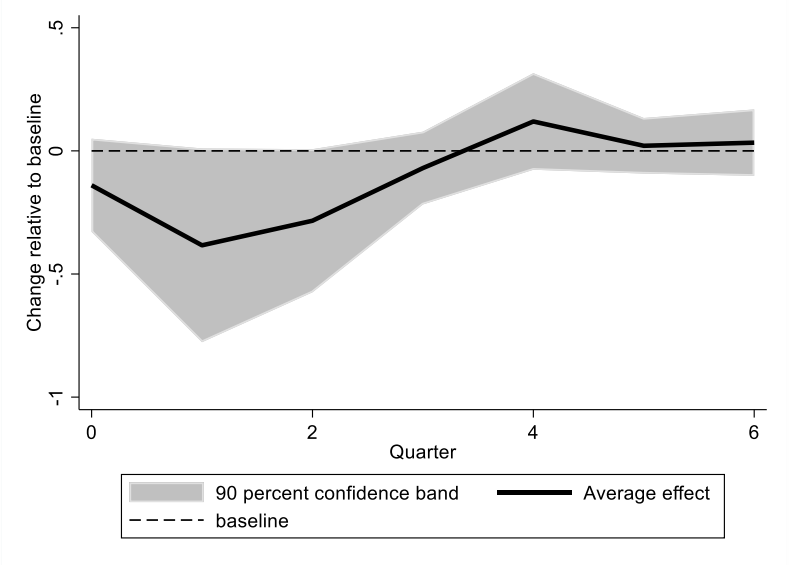
Standard errors are clustered at the country level.

Investment
Response to a one st.dev. to the unrest index



Standard errors are clustered at the country level.

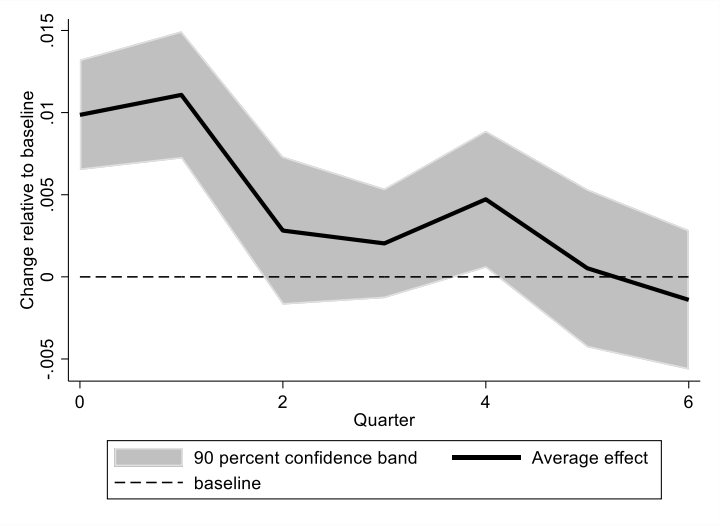
Trade balance
Response to a one st.dev. to the unrest index



Standard errors are clustered at the country level.

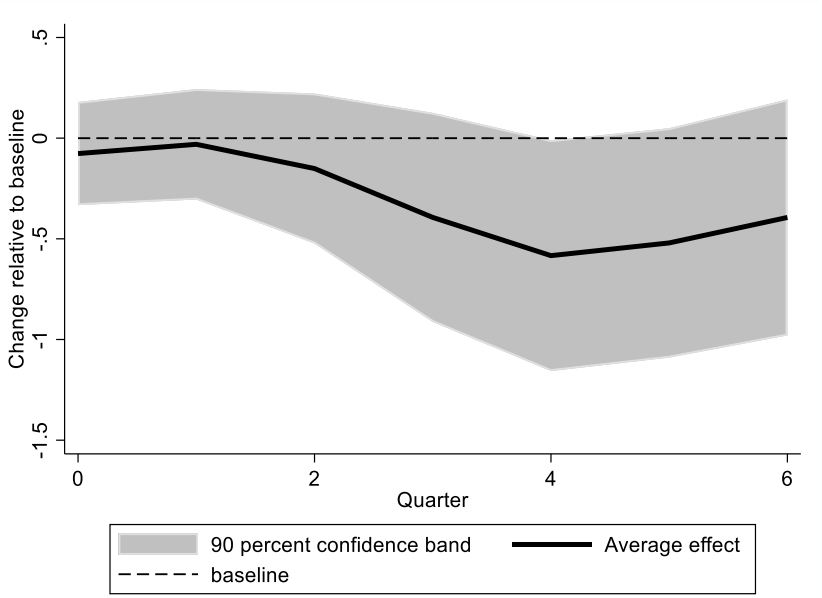
Unrest increases uncertainty and somewhat dampens consumer confidence

World Uncertainty Index for the country
Response to a one st.dev. to the unrest index



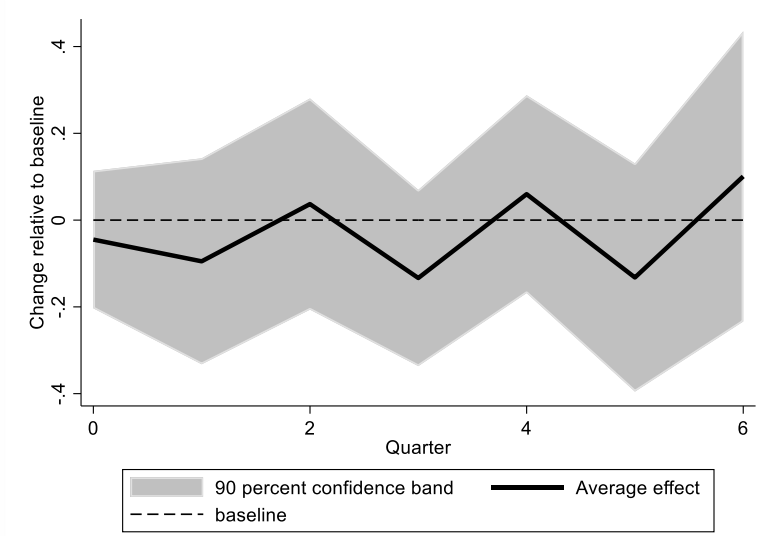
Standard errors are clustered at the country level.

Consumer confidence
Response to a one st.dev. to the unrest index



Standard errors are clustered at the country level.

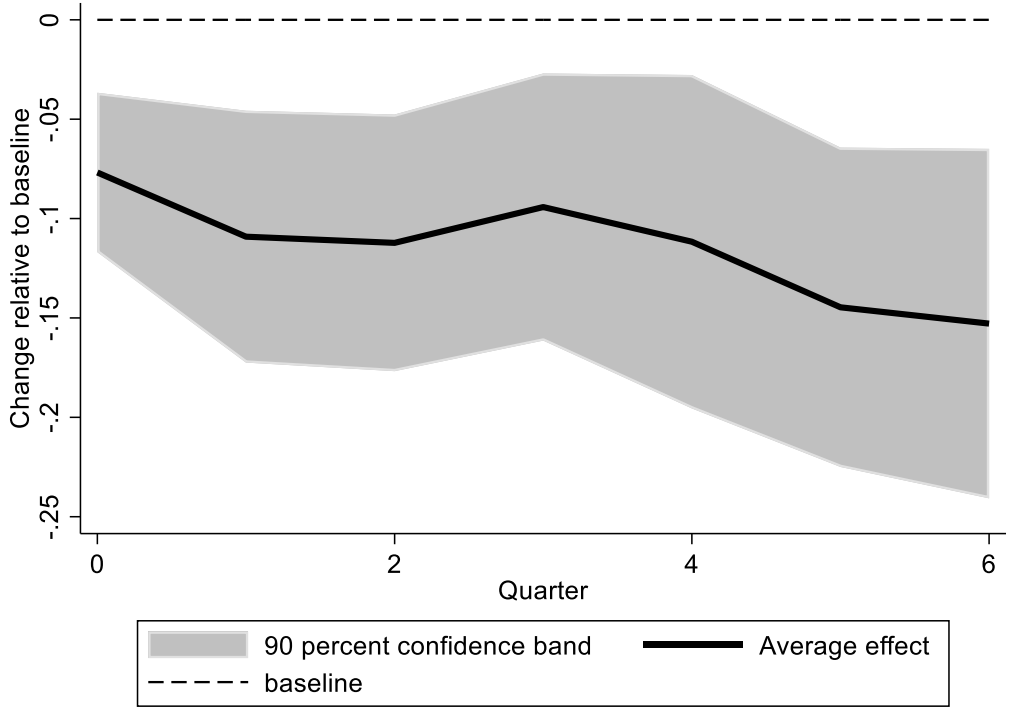
Business Confidence
Response to a one st.dev. to the unrest index



Standard errors are clustered at the country level.

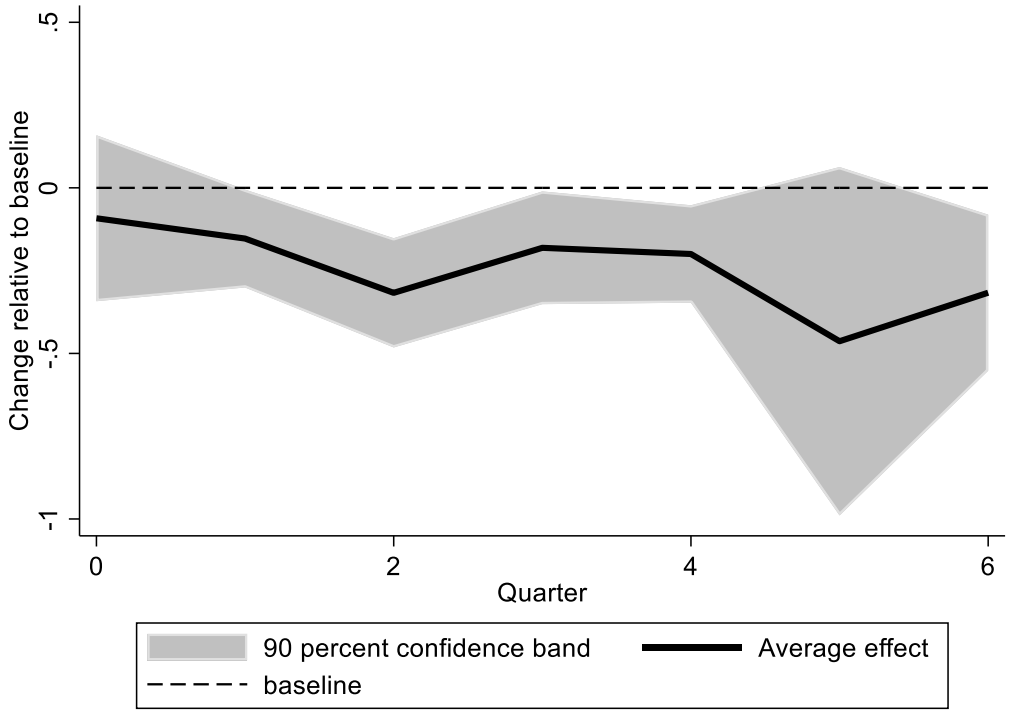
The adverse effects of unrest are evident in all countries regardless of income levels, but impact is (about 3 times) larger in EMs

GDP, advanced economies
Response to a one st.dev. to the unrest index



Standard errors are clustered at the country level.

GDP, EMs
Response to a one st.dev. to the unrest index



Standard errors are clustered at the country level.

Results: role of institutions and policy space

Econometric approach (state-dependent LP)

- In addition to the benchmark regression presented previously, we explore specifications that condition the response of activity to social unrest shocks to particular states *S*.

- The typical specification takes the following form (unrest=RSUI)

$$y_{i,t+h} - y_{i,t-1} =$$
$$F(z_{i,t-1})\left[\alpha^h_{high,i} + \gamma^h_{high,t} + \beta^h_{high} unrest_{i,t} + \delta_{high} X_{i,t}\right] +$$
$$(1 - F(z_{i,t-1}))\left[\alpha^h_{low,i} + \gamma^h_{low,t} + \beta^h_{low} \mathrm{unrest}_{i,t} + \delta_{low} X_{i,t}\right] + \varepsilon_{i,t+h}.$$

- $F(z_{i,t-1})$ is a smooth function of the state variable taking a value between 0 and 1; z is a normalized version of the state variable such that $F(0) = \frac{1}{2}$.

- The state variables account for:

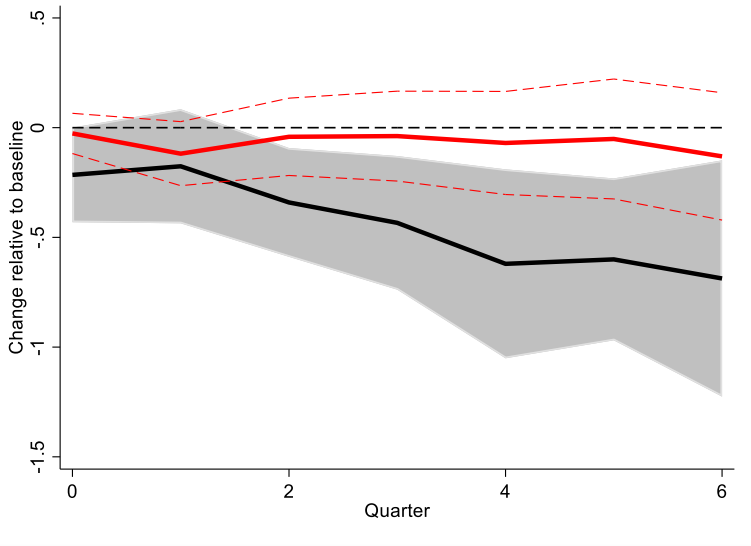
  i) Rule of law; ii) Debt level; iii) Exchange rate flexibility; iv) Product market competition, and v) Labor market flexibility

- As is common in the literature, we assume $F(z_{i,t-1}) = \exp\left(-\lambda_0 z_{i,t-1}\right) / \left(1 + \exp\left(-\lambda_0 z_{i,t-1}\right)\right)$

Strong institutions and available policy space can dampen the adverse effects of unrest

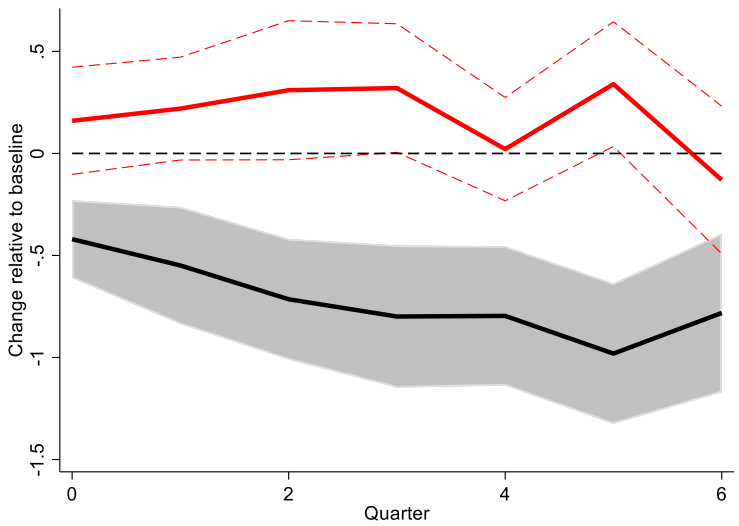
Black (red) lines corresponding to weak (strong) institutions/policy space

GDP's response to social unrest, by level of rule of law



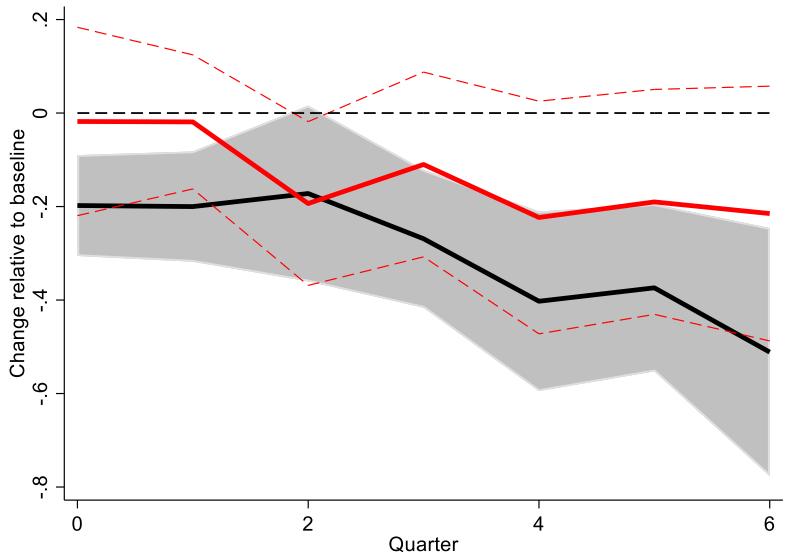
Standard errors are clustered at the country level.

GDP's response to social unrest, by debt level



Standard errors are clustered at the country level.

GDP's response to social unrest, by XR-flexibility

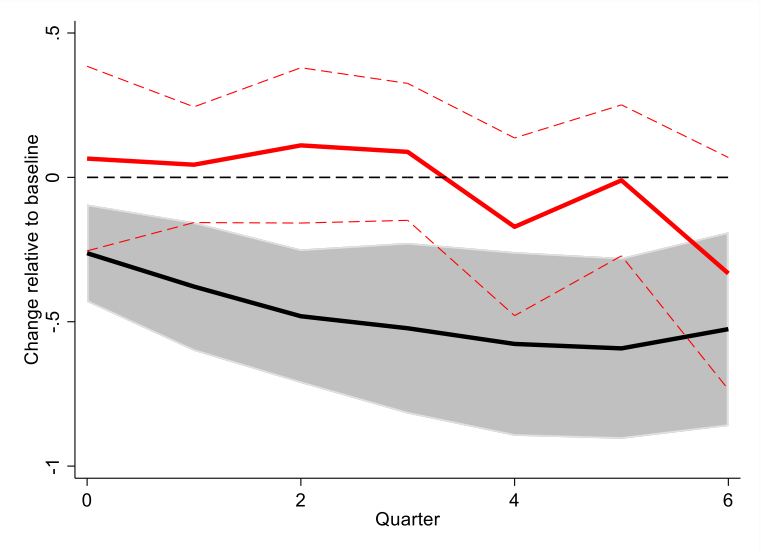


Standard errors are clustered at the country level.

Some structural factors affect performance following episodes of unrest, others do not

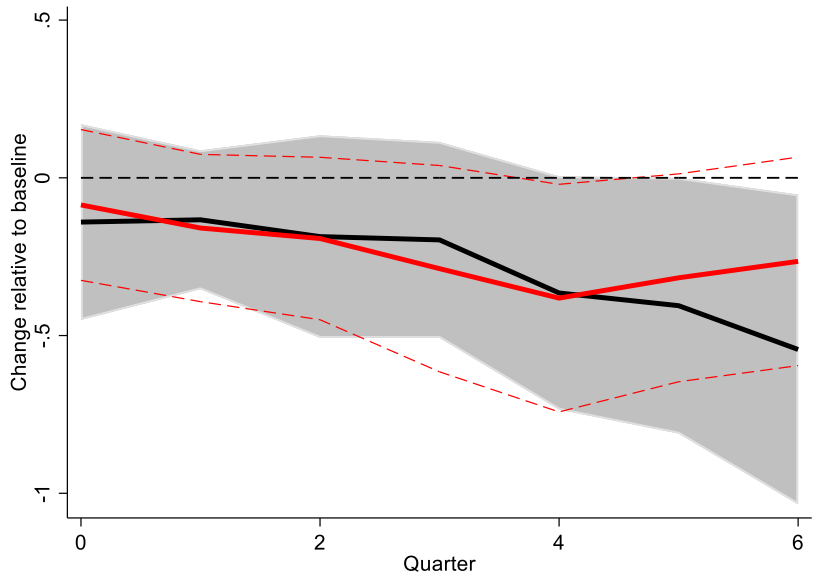
Black (red) lines corresponding to low (high) competition/flexibility

GDP's response to social unrest, by level of Product Market Competition



Standard errors are clustered at the country level.

GDP's response to social unrest, by level of Labor Market Flexibility



Standard errors are clustered at the country level.

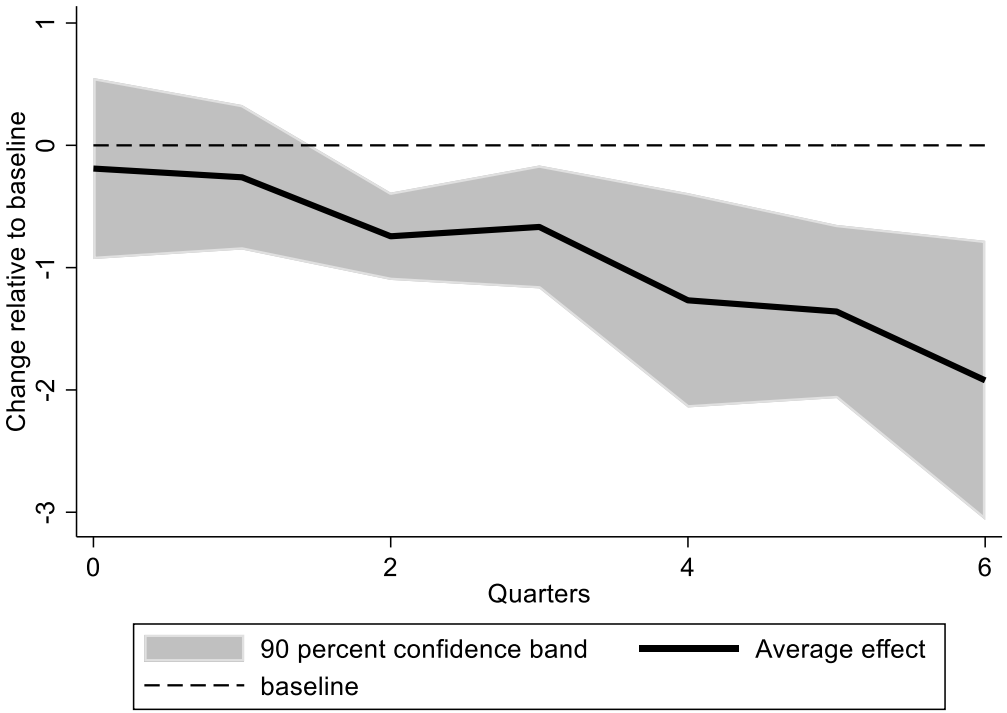
- Prior was for structural factors to affect medium-term performance, not necessarily the immediate response to unrest events.
- Open question: what could be plausible mechanisms through which low PMC amplifies the adverse effects of social unrest?

Standard errors are clustered at the country level.

Results: large events and different types of episodes

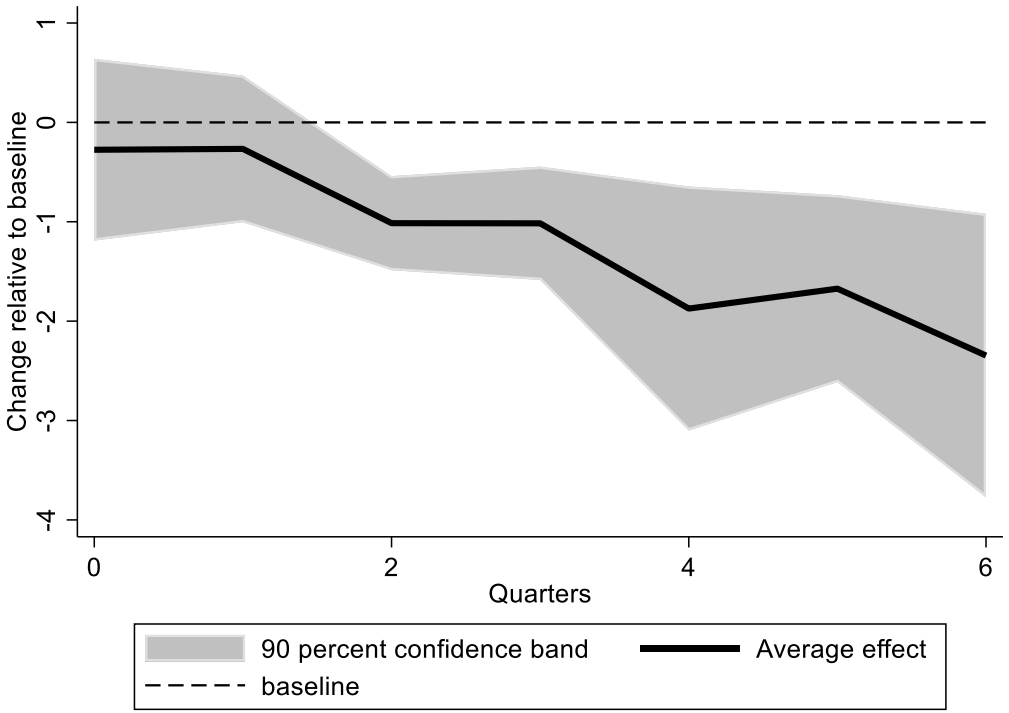
Not surprisingly, large unrest events lead to larger GDP contractions (twice as much)

GDP
*Response after a new **event** (identified by algorithm)*



Standard errors are clustered at the country level.

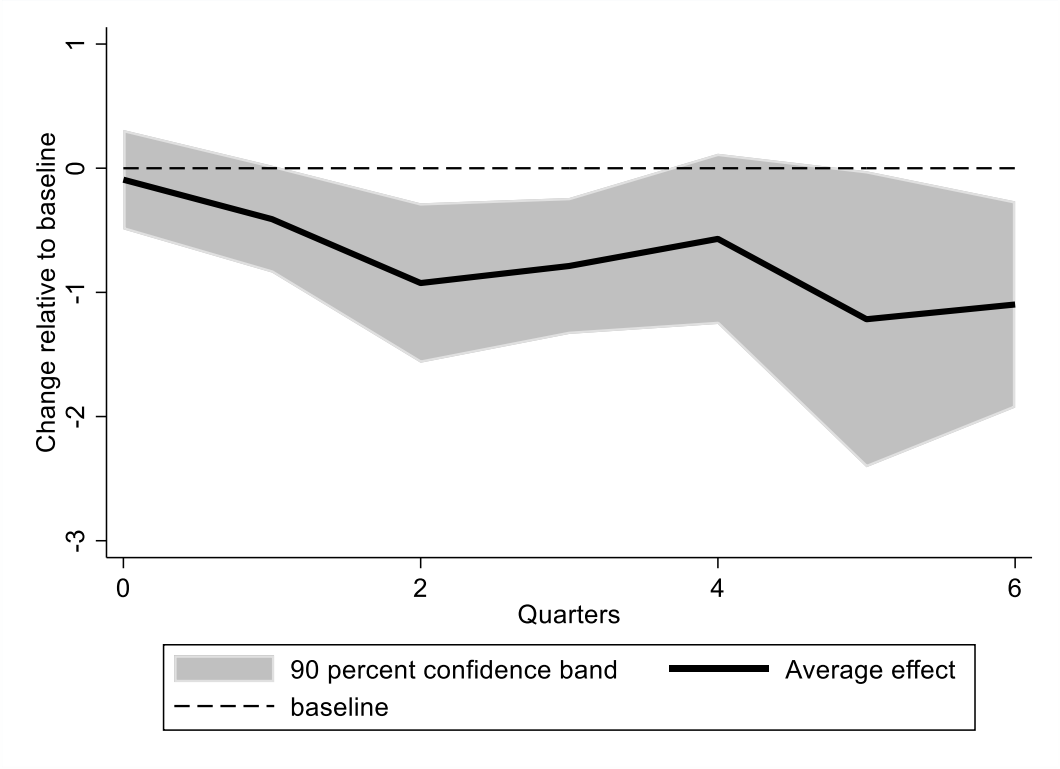
GDP
*Response after a new **major event** (identified by algorithm)*



Standard errors are clustered at the country level.

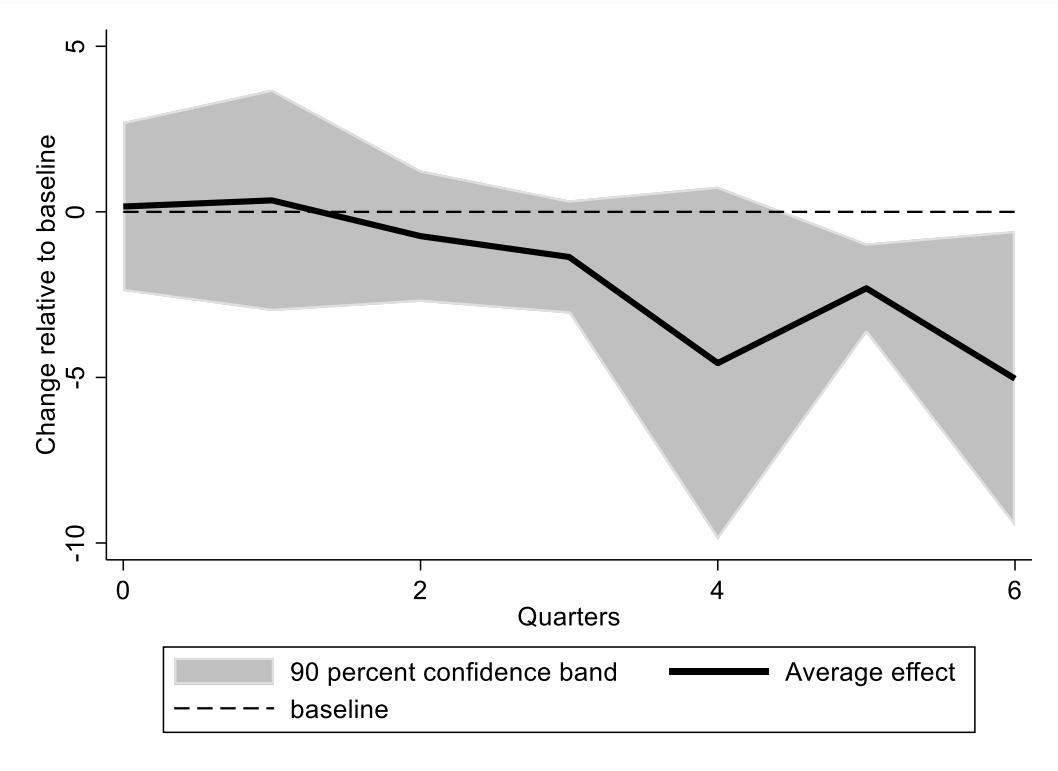
Unrest episodes motivated by socio-economic issues lead to sharper GDP contractions than episodes related to politics/elections…

GDP
Response to events triggered by politics



Standard errors are clustered at the country level.

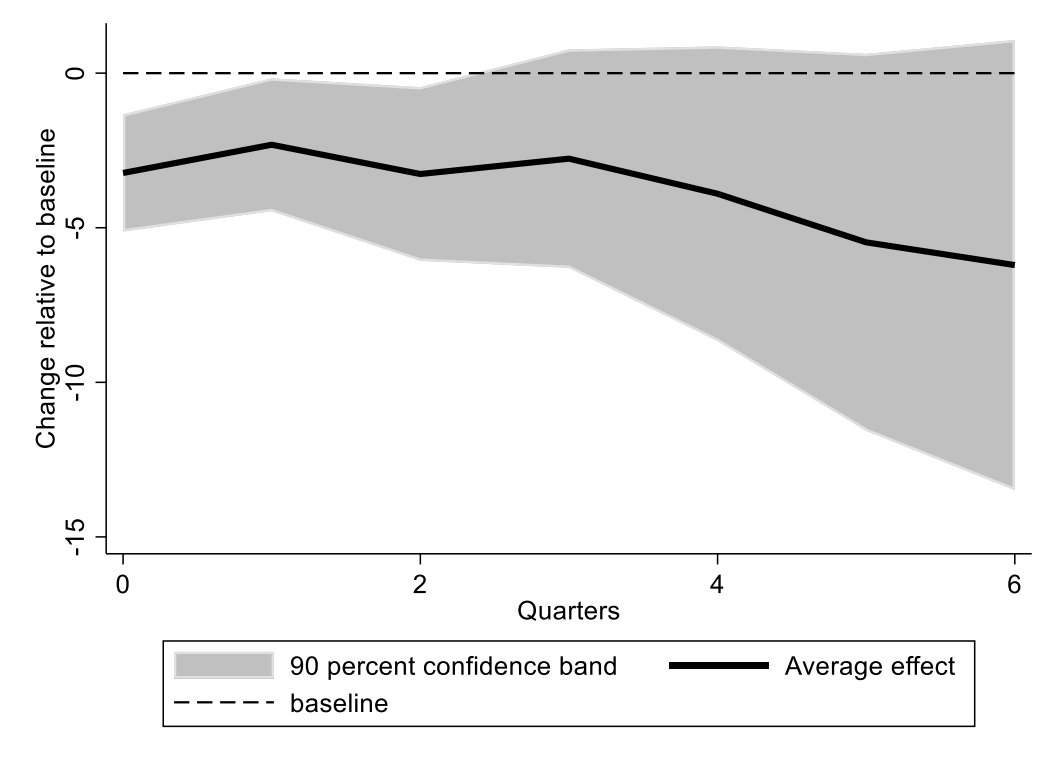
GDP
Response to events associated with social issues



Standard errors are clustered at the country level.

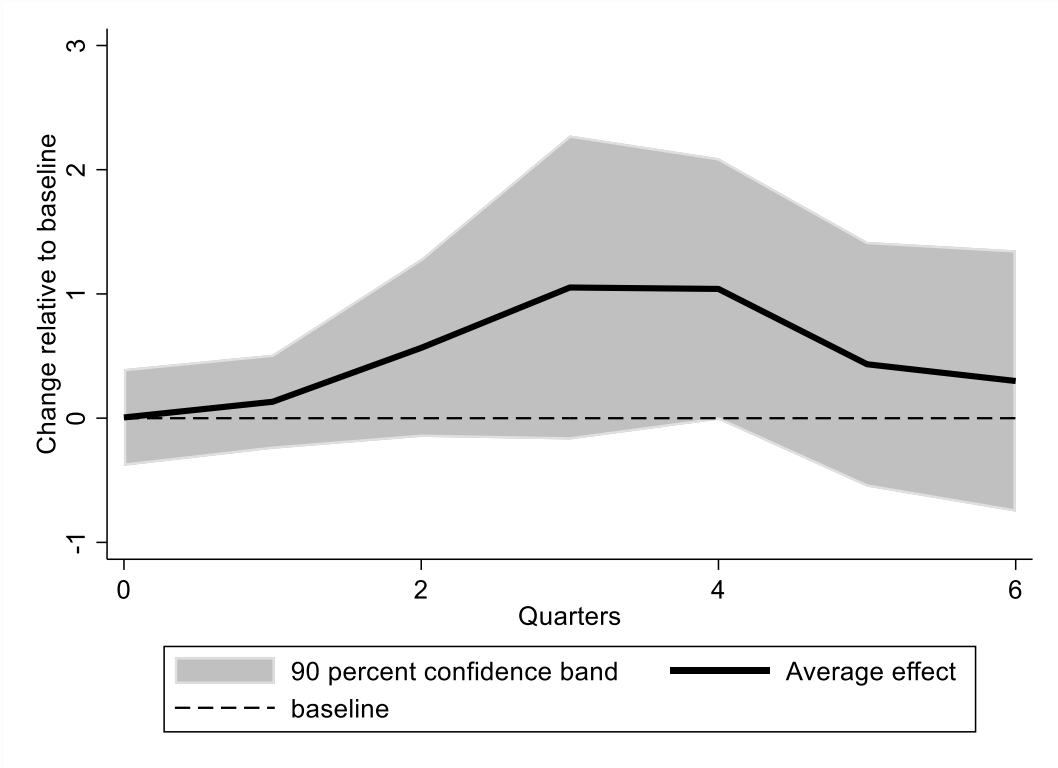
...while episodes triggered by intertwined socio-economic and political issues are associated with largest GDP contractions

GDP
Response to events associated with both



Standard errors are clustered at the country level.

GDP
Response to events that cannot be labeled

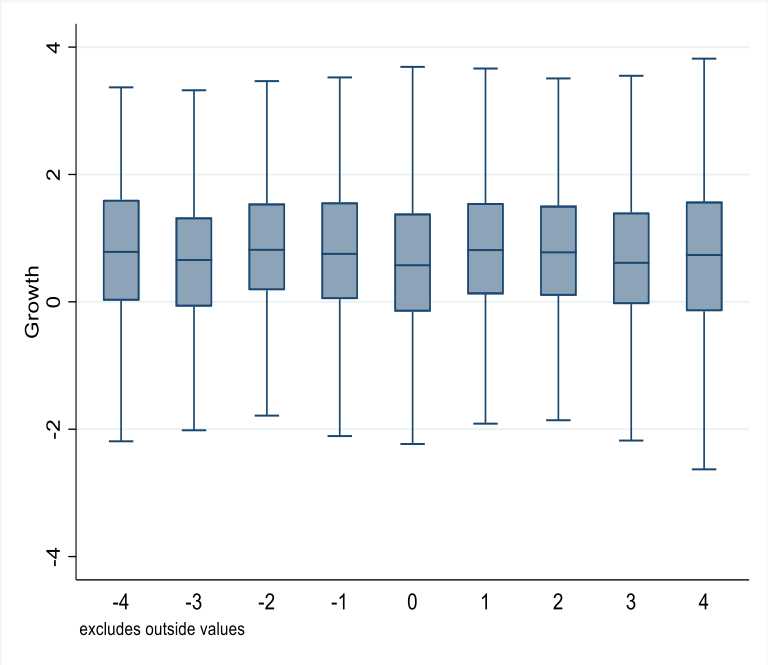


Standard errors are clustered at the country level.

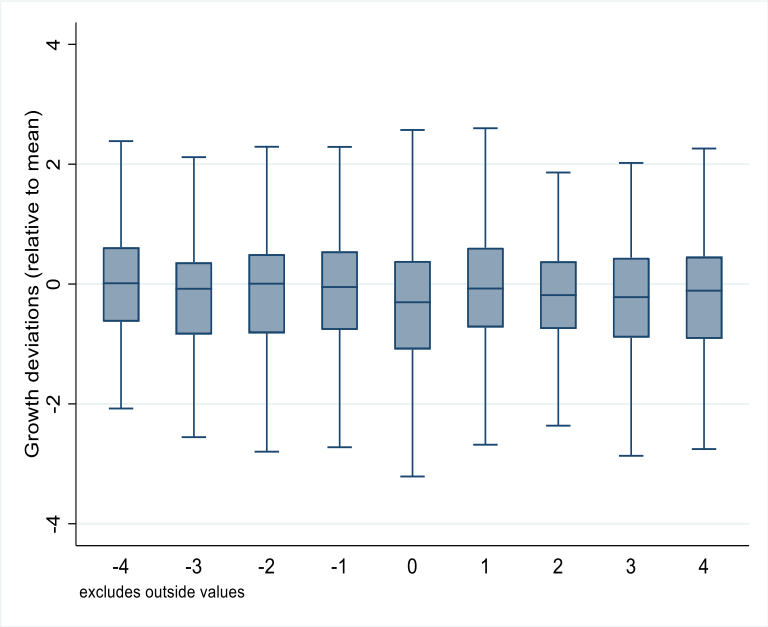
Addressing endogeneity concerns

No clear growth decline pre-unrest, apart from in t-3 average growth deviation below zero for 4q after unrest

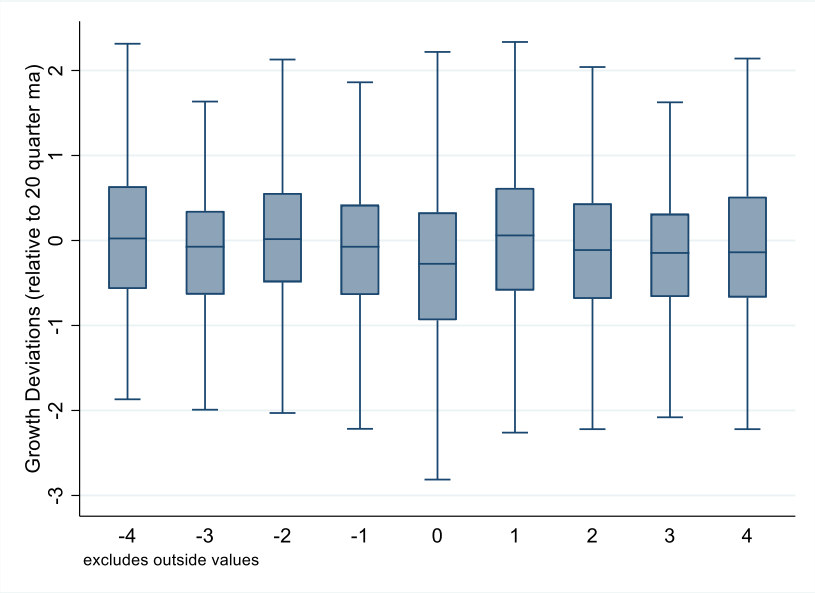
Growth distribution around new events



Distribution of growth deviations around new events: simple average



Distribution of growth deviations around new events: moving average



Methodology (I)

We refine our regressions to control for potential endogeneity both when using RSUI and events. When using "events" we run the following regression:

$$y_{i,t+h} - y_{i,t-1} = \alpha_i^h + \gamma_t^h + \beta_{sg}^h \mathrm{sg}_{\mathrm{event}_{i,t}} + \beta_s^h \mathrm{s}_{\mathrm{event}_{i,t}} + \beta_g^h g_{\mathrm{event}_{i,t}} + \delta X_{i,t} + \varepsilon_{i,t+h}$$

- $\mathrm{sg}_{\mathrm{event}_{i,t}}$: a dummy taking value one if country *i* experienced a social unrest event in period *t* **and** experienced two or three quarters of below average growth in the three quarters preceding the unrest event;

- $\mathrm{s}_{\mathrm{event}_{i,t}}$: takes value one if country *i* experienced a social unrest event and **did not** experienced two or three quarters of below average growth in the three quarters preceding the unrest event;

- $\mathrm{g}_{\mathrm{event}_{i,t}}$: takes value one if country *i* experienced two or three quarters of below average growth **prior** to *t* and did not experience a social unrest event. The excluded group are countries that neither experienced unrest nor low growth.

- Growth events based on negative deviations from country averages (at least 2 out of the last 3 quarters). **Robust** to alternative definitions based on: similar deviations from MA, or from zero growth, as well as negative growth in t-1

Methodology (II)

We follow a slightly modified approach when using RSUI as our shock. In this case we run the following LP model:

$$
\begin{aligned}
& y_{i,t+h} - y_{i,t-1} \\
& = \alpha_i^h + \gamma_t^h + \beta_{low}^h * low_{i,t} * RSUI \\
& + \beta_{no\ low}^h * \left(1 - low_{i,t}\right) * RSUI_{i,t} + \delta_{low}^h * low_{i,t} + \delta_{low}^h * (1 - low_{i,t}) + \delta X_{i,t} + \varepsilon_{i,t+h}
\end{aligned}
$$

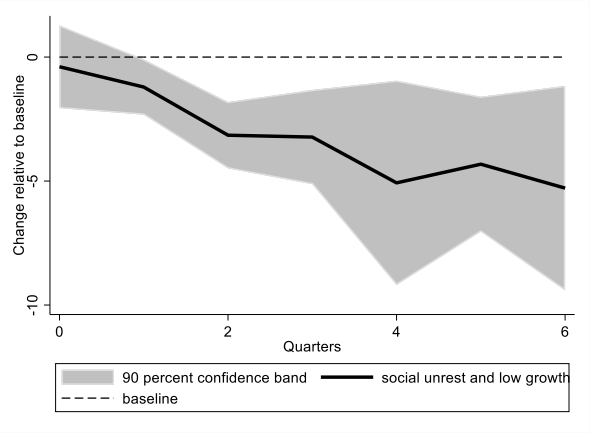
Where $low_{i,t}$ is a dummy variable that takes value one if country *i* experienced two or three quarters of below average growth **prior.**

- Thus, β_{low}^h captures the effect of an increase in the social unrest index (RSUI) in countries with prior low growth, and $\beta_{no\ low}^h$ captures the effect of an increase in the social unrest index (RSUI) in countries with no prior low growth.

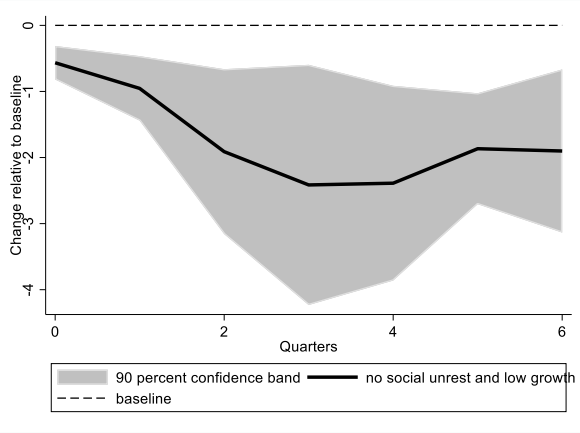
Social unrest affects growth even when controlling for prior adverse growth events (I)

- Panel 3 shows that social unrest affects growth even if not preceded by adverse growth events
- Panels 1 and 2 show that adverse growth events are persistent, but when followed by social unrest then the future growth impact is larger
- Indeed, Panel 4 shows that social unrest significantly worsens the growth impact of adverse growth events

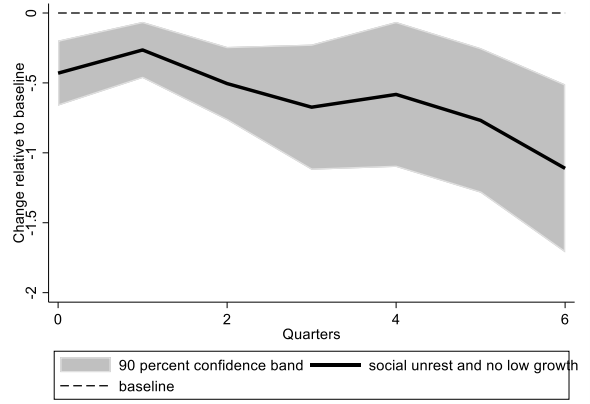
Panel 1. Impulse response of events of both social unrest and low growth



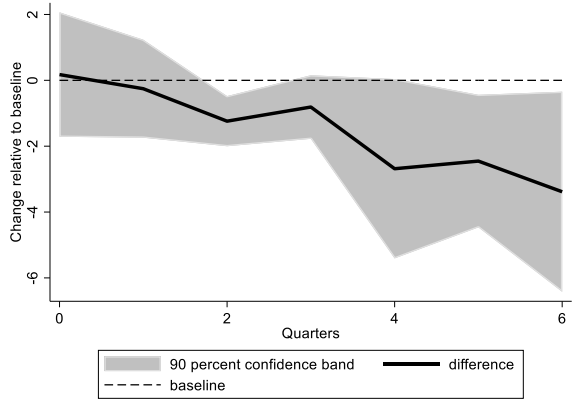
Panel 2. Impulse response of events of low growth and no social unrest



Panel 3. Impulse response of social unrest and no low growth

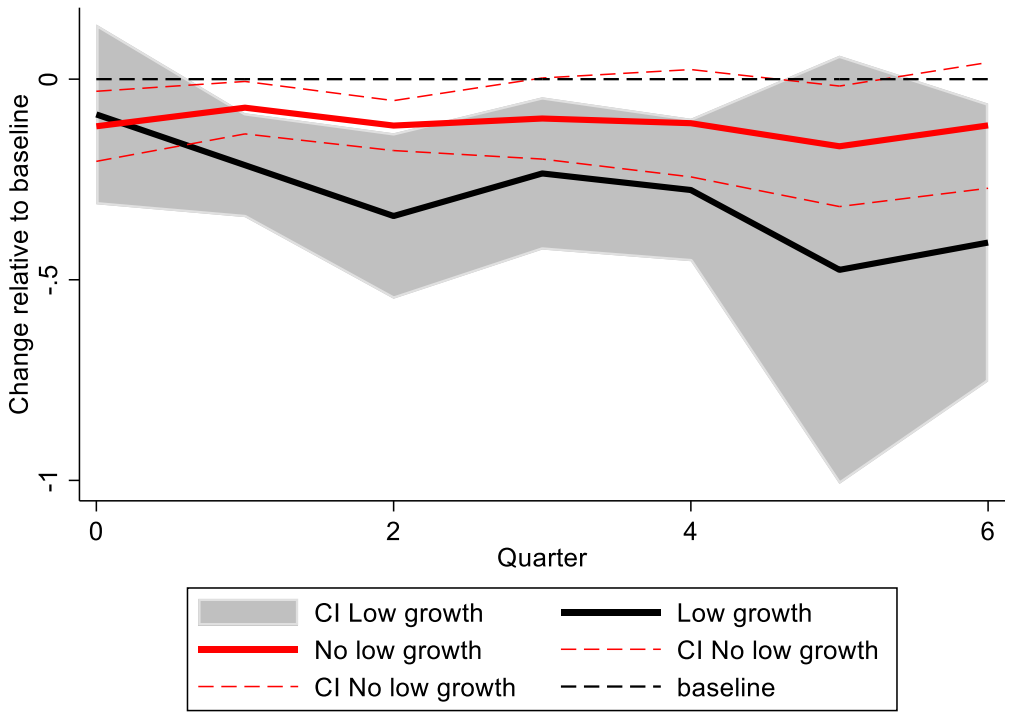


Panel 4. Difference in impulse response between events of low growth and social unrest and low growth with no unrest



Social unrest affects growth even when controlling for prior adverse growth events (II)

- Similar results when using RSUI.
- A one st. dev. spike in RSUI lowers GDP in countries that experienced prior low growth.
- Similarly, spikes in RSUI diminishes GDP in countries that were not experiencing low growth, albeit effects are smaller and last fewer quarters.



Conclusions

Conclusions (I)

- Economic activity declines following a one standard deviation increase in the unrest index, with GDP remaining on average ¼ pp below the pre-shock level after 6 quarters

- Adverse effect on GDP is driven by sharp contractions of:
  - *Manufacturing and Services* (from sectoral perspective); and
  - *Consumption* (from demand side)

- Unrest is found to:
  - dampen (consumer) confidence and raise uncertainty
  - adversely affect both AE and EM, though effect seems larger for EMs

- Strong institutions and available policy space can dampen the adverse effects of unrest

Conclusions (II)

- Effects are larger when considering **events** of social unrest—which are increases of at least 4 standard deviations in the RSUI.
  - On average, GDP remains 2 percentage points below baseline after 6 quarters of a social unrest event.
  - For comparison, the impact of social unrest events is larger than the impact on GDP of a negative shock (2 st.dev.) to commodity terms-of-trade growth.
- Unrest episodes motivated by socio-economic reasons result in sharper GDP contractions compared to those associated mainly with politics/elections; episodes triggered by a combination of socio-economic and political issues see sharpest contractions
- Results are robust to controlling for previous adverse growth events
- Results based on monthly data somewhat weaker given the relatively high noise at such frequency