



# Market Functionality and Conflict Dynamics

What evidence tells us about the state of markets in conflict-affected areas

August 2025 | Sudan

## Key Messages

- Market functionality does not respond uniformly to conflict. **Different market functionality pillars (Access, Affordability, Availability, Resilience and Infrastructure) show distinct sensitivities to the three conflict dimensions** examined: conflict intensity, lagged effects and sustained periods of conflict.
- Access is most strongly correlated with prolonged exposure to conflict rather than isolated spikes in violence. **Access to markets appears to progressively adapt to longer term insecurity, maintaining physical access even in chronically affected areas.**
- **Availability is the pillar most correlated to immediate conflict intensity**, suggesting that vendor reported supply chains and networks reflect rapid adjustments that enable continuity of movement and supply.
- **Affordability is primarily sensitive to short-term lagged effects:** Prices tend to fall below the national average one month after a conflict event, but the absence of a two-month effect indicates short-term adjustments rather than sustained stability.
- **Resilience and infrastructure, in contrast, weaken primarily under sustained conflict exposure**, suggesting longer term structural changes in supply chains and market facilities.
- Collectively these patterns reveal dual conflict outcomes: **Markets demonstrate short-term adaptive capacity in response to acute shocks yet become increasingly fragile and structurally vulnerable as exposure to conflict persists.**

## Context & Rationale

Armed clashes in multiple cities across Sudan broke out on April 15th, 2023, between the Sudanese Armed Forces (SAF) and the Rapid Support Forces (RSF), resulting in displacement across the country and a deterioration of the already severe humanitarian needs.

Conflict dynamics significantly affect market systems, disrupting supply chains, restricting community movement, and limiting access to essential goods and cash. Despite the challenging context, markets in Sudan have demonstrated resilience, continuing to operate in heavily affected areas like Darfur and Kordofan, albeit at reduced capacity.

## Analysis Overview

IMPACT Initiatives conducted this analysis to understand how conflict dynamics affect market functionality across time and locations in Sudan, investigating the relationship between conflict events registered by [ACLED](#) and market functionality dimensions measured through the [Joint Market Monitoring Initiative \(JMMI\)](#).

### Methodology:

The factsheet presents the results of three models of analysis, each designed to capture a distinct dimension of the conflict-market relationship:

- **Direct conflict impact:** Assesses the relationship between the number of conflict events and each market functionality pillar, capturing the immediate effects of short-term spikes in violence.
- **Lagged effects:** examines how conflict events emerge one and two months after a recorded conflict event, highlighting delayed disruptions to market functionality.

- **Conflict duration:** Assess the longer-term structural effects of prolonged exposure to conflict by categorizing the length of time a locality has experienced ongoing conflict.

For each model, an atomic indicator decomposition was applied to identify sub-dimensions driving the most affected pillars. To strengthen the reliability of results, all models apply fixed effects at locality level. This accounts for unobserved differences between markets that do not change over time. Standard errors are also clustered by locality to reflect repeated observations within the same market over time.

In addition, selected models include time dummies (monthly fixed effects) to control common trends affecting all markets (such as seasonality or national shocks) and types of vendors, which intends to control for differences in the types of traders reporting (open-air versus permanent shops or specialized stores).

## Market Functionality

The Joint Market Monitoring Initiative (JMMI) data has been recorded by IMPACT Initiatives monthly, across 76 localities (13 states), between December 2023 and April 2025. The JMMI's Market Functionality Score (MFS) is a composite indicator developed by IMPACT Initiatives, aimed at classifying markets according to their levels of functionality. It is composed of 5 pillars, 4 of which are, in turn, composed of different sub-dimensions, comprising a number of indicators derived from a single vendor-focused assessment, including:

<b>Pillar 1</b>	<b>Accessibility</b>	<b>physical and social access to markets</b>
1.1	Physical access	vendors reporting physical barriers for customers to access marketplaces
1.2	Road access	vendors reporting damaged, deteriorating, dangerous, or inadequate access roads serving their marketplaces
1.3	Social access	vendors reporting social barriers for customers to access marketplaces
1.4	Safety access	safety access: vendors reporting lack of safety and/or insecurity in their marketplaces
<b>Pillar 2</b>	<b>Availability</b>	<b>the ability of markets to consistently supply core commodities, based on the reported level of availability of monitored items</b>
<b>Pillar 3</b>	<b>Affordability</b>	<b>financial access to markets and price volatility</b>
3.1	Price levels	variation between prices of monitored items during the data collection window, and national average
3.2	Financial access	vendors reporting financial barriers for customers to access marketplaces
3.3	Price volatility	vendors unable to predict price changes over the following 30 days
<b>Pillar 4</b>	<b>Resilience*</b>	<b>vulnerability of supply chains and ease of restocking</b>
4.1	Supply diversity	vendors report they mostly rely on a single supplier to stock their businesses by category
4.2	Supply chain disruption	vendors reporting difficulties keeping their business operational and well-stocked
<b>Pillar 5</b>	<b>Infrastructure</b>	<b>state of markets' physical and financial infrastructure</b>
5.1	Adequacy of facilities	vendors reporting the presence of damaged, deteriorating, dangerous, or inadequate commercial structures in their marketplaces
5.2	Storage	vendors reporting that they lack access to a locked, secure storage facility for their stock within their marketplaces
5.3	Payment modalities	vendors reporting that they accept payment modalities other than cash or informal credit

\* The resilience pillar for the Sudan JMMI MFS, includes 2 out of the 4 sub-pillars.

## Conflict triggers adaptive responses to market availability and infrastructure, suggesting that conflict does not uniformly disrupt market systems in the short-term

**Conflict events appear to trigger reactive or compensatory dynamics, allowing market systems to adapt and continue operating despite insecurity.** To isolate the specific effect of conflict events, the analysis controls time trends and vendor characteristics, ensuring that observed changes are not simply driven by broader market conditions or differences between traders. When these factors are accounted for, **two pillars of the Market Functionality Score- availability and infrastructure- remain positively and significantly associated with conflict events.**<sup>1</sup> Availability shows a stronger association ( $\beta = 0.18, p < 0.001$ ) than infrastructure ( $\beta = 0.08, p < 0.001$ ) **suggesting localized resilience or substitute strategies that allow markets to continue functioning despite disruptions.**<sup>2</sup> Empirical evidence from the wider literature on conflict-affected markets from a vendor perspective, also points to adaptation strategies such as relying on smaller suppliers located in rural areas in their vicinity, or accepting different payment modalities to cope with the increased risk associated with holding cash.<sup>2,3</sup> While this aligns conceptually with our findings, the comparison should be treated as indicative rather than directly equivalent.

**The infrastructure pillar shows a modest but consistent positive relationship with conflict dynamics,** indicating that physical and financial market systems, such as facilities, storage capacity and payment modalities remain functional as markets adjust to insecurity. A decomposition analysis reveals that this infrastructure pattern is marginally driven by the “Market Facility” sub-indicator<sup>4</sup> ( $\beta = 0.05, p < 0.05$ ), **reflecting fewer vendors reporting the presence of damaged or deteriorating structures in their marketplaces.**

## Lagged effects of conflict reveal disruptions to market functionality evolve over time, rather than manifesting immediately

To understand whether the effects of conflict unfold gradually rather than only at the time-point of shock, we apply a simplified fixed-effects model that excludes time and vendor controls. This design intentionally isolates temporal dynamics that would otherwise be absorbed by seasonal patterns or differences in trader characteristics, allowing us to observe how markets adapt — or deteriorate — in the weeks following conflict events.

While immediate impacts of conflict events appear to trigger compensatory market responses, delayed effects present a more complex picture. **Conditions do not uniformly decline, instead, market pillars respond differently over time.**

**Affordability** shows a distinctive lagged pattern. **Although no significant change is recorded immediately after conflict, a strong and significant increase in affordability scores emerges one month later** ( $\beta = 0.23, p < 0.001$ ). This suggests that prices often fall below the national average around four weeks after conflict shocks, **potentially reflecting reduced local demand, or behaviour by vendors to maintain purchasing activity.**<sup>5</sup> This temporary improvement in affordability may reflect the fall in demand because of the decrease in purchasing power due to the disruption of the daily labour market.<sup>3</sup> **Decomposition of the pillar reveals a short-term improvement is primarily driven by reductions in price levels relative to the national average** ( $\beta = 0.23, p < 0.01$ ), with some contribution from improved financial access ( $\beta = 0.23, p < 0.05$ ). Collectively these findings imply that affordability tends to temporarily improve one month after conflict, largely due to reduced absolute price levels, but this does not reflect longer-term price stability or sustained improvements in market conditions.<sup>6</sup>



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In contrast, **Resilience**, as an aggregate measure, shows no significant lagged effect. However, the supply diversity component declines sharply one month after conflict ( $\beta = -0.17, p < 0.05$ ), indicating vendors' increased reliance on fewer or single suppliers. This indicates a narrowing of supply chains, potentially due to access constraints or shrinking vendor networks.<sup>8</sup>

These findings collectively reflect that while markets may appear to adapt to conflict initially, structural vulnerability deepens over time. Temporary affordability gains mask deeper vulnerabilities, as supply options shrink and the capacity to withstand future shocks diminishes.

## As conflict becomes more sustained over time, market resilience declines significantly across localities — even more with sharply prolonged exposure

**Analysis of conflict duration reveals a pattern: As exposure becomes more sustained, market resilience erodes, with the sharpest declines observed under prolonged conflict.** Moderate ( $\beta = 5.46, p < 0.05$ ) and long-term exposure ( $\beta = 13.77, p < 0.001$ ) are associated with significant adaptations in market access, largely driven by fewer vendors reporting inadequate road access to marketplaces. Atomic-level decomposition confirms

this effect for long-duration exposure ( $\beta = 1.18, p < 0.01$ ). **This suggests that traders adjust access mechanisms in protracted crises, prioritizing continuity of trade over perceived insecurity.**<sup>3,8</sup> Conflict duration analysis reveals that **Availability** only increases significantly in areas experiencing long-term exposure ( $\beta = 4.26, p < 0.01$ ), suggesting that markets may require prolonged insecurity before availability stabilizes or improves — possibly reflecting progressive adaptation of supply chains and market actors to persistent conflict conditions.<sup>2</sup>

Conversely, **Resilience** measures, particularly supply chain diversity, decline sharply over protracted conflict. After controlling for vendor types, supply diversity declines progressively in localities exposed to sustained conflict, with a drop of  $-2.53 (p < 0.001)$  in moderate-duration settings and  $-4.09 (p < 0.001)$  under long-term exposure, **indicating a narrowing supplier base that heightens vulnerability and reduces market flexibility.**

Collectively, these findings suggest that while conflict-affected markets may appear functional in terms of access, longer conflict duration is associated with deeper structural vulnerabilities particularly in supply diversity, which can compromise recovery and long-term market stability.

## Methodology Overview

The present analysis combines conflict events data, recorded by ACLED, and JMMI MFS data, collected and analysed by IMPACT Initiatives.

You can find specific information on the composition and rationale of conflict events and market functionality data on [page 2](#).

The analysis dataset was constructed by integrating JMMI data with conflict events data from ACLED. The MFS data underwent initial processing to standardize date formats by parsing month-year strings into numeric time identifiers and encoding district names as locality identifiers. To incorporate conflict dynamics, ACLED data was prepared with matching temporal identifiers and district names were harmonized to ensure accurate merging. The datasets were merged using a many-to-many match on district and time identifiers, with unmatched MFS observations assigned zero conflict events. Once obtained the merged dataset, a panel structure was established

with locality-time units, and conflict duration measures were generated by creating binary conflict indicators, calculating cumulative conflict exposure within each locality, and categorizing this exposure into four ordinal levels (None: 0 events; Short: 1-3 events; Moderate: 4-10 events; Long: > 10 events). This integrated dataset enables analysis of how conflict dynamics relate to market functionality and access indicators across districts and time periods.

The analysis employs three distinct models examining different temporal aspects of conflict impact on market functionality from January 2024 to April 2025.

An atomic indicator decomposition is applied to all three models to identify which specific sub-dimensions of market functionality drive the observed changes in each pillar, providing granular insights into the mechanisms through which conflict impacts market systems.

## Annex: Correlation tables

Table 1: Conflict events (intensity) and MFS pillars

Pillar/sub pillar #	(2)	(5)	(5.1)
Pillar/sub pillar name	Availability	Infrastructure	Adequacy of facilities
events	0.186*** (3.56)	0.0872*** (4.44)	0.0460* (2.13)
N	519	473	444

*t statistics in parentheses*

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Table 2: Lagged events and MFS pillars

Pillar/sub pillar #	(2)	(2.1)	(4)	(4.1)
Pillar/sub pillar name	Affordability	Price levels	Resilience	Supply diversity
One month lag	0.228*** (5.01)	0.0779** (2.96)	-0.0448 (-0.51)	-0.177* (-2.56)
Two-month lag	-0.0680 (-1.59)	-0.0289 (-1.05)	0.0806 (1.13)	0.119* (2.40)
N	204	204	204	204

*t statistics in parentheses*

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Table 3: Conflict duration and MFS pillars

Pillar/sub pillar #	1	1.2	1.3	4	4.1
Pillar/sub pillar name	Access	Physical access	Road Access	Resilience	Supply diversity
Medium conflict duration	5.466* (2.44)	1.100 (1.11)	0.557 (1.29)	-0.589 (-0.85)	-2.534*** (-3.79)
Long conflict duration	13.77*** (3.73)	4.550** (3.31)	1.179** (2.92)	-0.858 (-0.89)	-4.099*** (-4.12)
N	473	444	444	519	485

*t statistics in parentheses*

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

## Endnotes

- <sup>1</sup>Conflict and trade: the relationship between trade and civil conflict in Sudan. Sparks DL. African Journal of Economic Policy. 2011
- <sup>2</sup>[Functional markets in Yemen's war economy](#). Huddleson, RJ. And Wood, D. Journal of Illicit Economies and Development. 2020
- <sup>3</sup>[The impact of war on trade and markets in Darfur](#): Destruction, resilience and adaptation. SPARC. April 2025
- <sup>4</sup>Adequacy of facilities: vendors reporting the presence of damaged, deteriorating, dangerous or inadequate commercial structures in their marketplaces
- <sup>5</sup>[Adaptation and Devastation: the impact of conflict on trade and markets in Darfur](#). Buchanan-Smith and Fadul. May 2008
- <sup>6</sup>[The impact of armed civil conflict on household welfare and policy](#). Patricia Justino. Institute of Development Studies. December 2011
- <sup>7</sup>[Market in Crisis: the implications for humanitarian action](#). Simon Levine. Humanitarian Policy Group. August 2017
- <sup>8</sup>Market support interventions in humanitarian contexts. Sophie Martin Simpson and Helene Julliard. The Cash Learning Partnership. 2018

### ABOUT IMPACT

IMPACT Initiatives is a Geneva based think-and-do-tank, created in 2010. IMPACT is a member of the ACTED Group.

IMPACT's teams implement assessment, monitoring & evaluation and organisational capacity-building programmes in direct partnership with aid actors. Headquartered in Geneva, IMPACT has an established field presence in over 15 countries. IMPACT's team is composed of over 300 staff, including 60 full-time international experts, as well as a roster of consultants, who are currently implementing over 50 programmes across Africa, Middle East and North Africa, Central and South-East Asia, and Eastern Europe.