Research Brief

Small Firm Dynamics Under Conflict: Evidence from Nigeria

INTRODUCTION

The informal private sector is crucial to the livelihoods of a large part of the population in low-income countries. It is a critical mechanism for inclusive policies and reducing inequality, and may mitigate tensions that give rise to conflict (United Nations and World Bank, 2018). A significant number of studies suggest that self-employment does not reduce with conflict, and may even increase (Ciarli et al. (2015b)). But this seems to occur in activities with lower capital investment (Deininger (2003); Ciarli et al. (2015a)).

In this framing document we summarise evidence on the impact of conflict on the dynamics of small, informal, firms owned by households (non-farming enterprises (NFEs)). We ask the following questions:

1. Does conflict influence whether households own an entrepreneurial activity?

    A) If yes, does this influence the number of NFE across industries?

2. Does conflict intensity influence NFE behaviour and performance?

    A) If yes, does this influence differ across industries?

3. What drives the impact of conflict on entrepreneurship and NFEs' behaviour and performance?

    A) Operation costs?

    B) Final demand?

We address these questions by studying the Nigerian households surveys between 2010-2015, during which conflict has increased substantially, especially in peri-urban and rural areas (Figure A in the Annex).
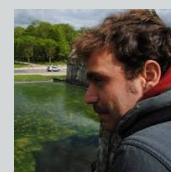
Key findings

- An increase in conflict intensity reduces the probability that households hold a non-farming enterprises (NFE), but increases the probability that they are self-employed;

- As a consequence of conflict, NFE reduce their capital and input stocks, but they hire the same number of workers, and they increase the number of months in operation. Their performance also reduces: sales, productivity and profits drop;

- The cost of inputs, especially access to credit, increases, reducing firm investment. Demand also seems to explain reduced NFE performance.

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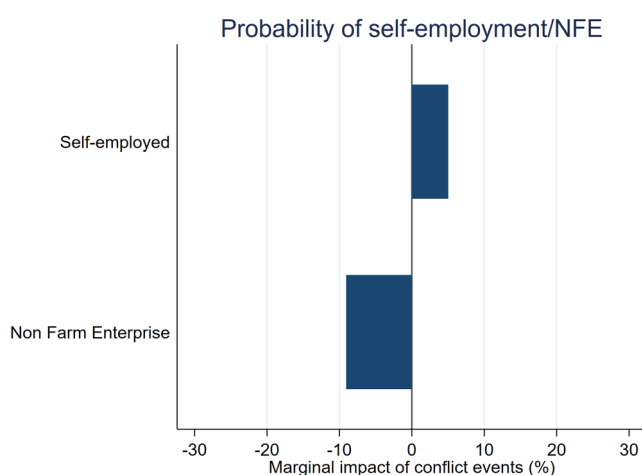
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DOES CONFLICT INFLUENCE WHETHER HOUSEHOLDS OWN AN ENTREPRENEURIAL ACTIVITY AND DOES THIS INFLUENCE THE NUMBER OF NFES ACROSS INDUSTRIES?

Despite the increase in conflict events, we observe high entrepreneurial activity in Nigeria between 2010-15 both in areas that experienced few events and in areas that experienced many events (Figure B in the Annex). However, our results show that a 100% increase in conflict events in a given area in the previous year:[1]

1) reduces the probability that a household owns a NFE by 10% points; and

2) increases the probability that individuals are self-employed (in non-agricultural activities) by 5% points (Figure 1).

These effects are stronger in areas that have not experienced conflict before than in areas that have experienced conflict before.

Figure 1: Impact of conflict on the probability that a household owns a NFE
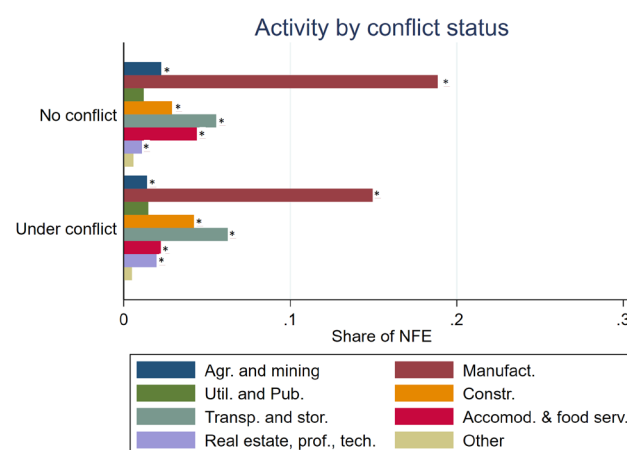

Probability of self-employment/NFE

Notes: Each horizontal bar plots the effect of a 100% increase in conflict (for the average value of conflict) on the probability that a household owns a NFE (bottom) or is self-employed (top). Data refer to 2010-2015 household surveys across Nigeria. Conflict intensity is measured as number of conflict events within 30km of the village where the household lives.

Key findings:

Although entrepreneurial activity (micro and small informal firms owned by households) seems to occur everywhere, it reduces with high conflict. Smaller self-employment activities, instead, increase.

Conflict slightly modifies the distribution of NFE across industries, with manufacturing, accommodation and food services reducing the most in conflict areas, and construction and transport being more frequent in conflict areas (Figure 2).

Figure 2: Distribution of NFE by industry in conflict and no-conflict areas

Activity by conflict status

Notes: the figure plots the share of NFE in conflict (bottom graph) and non-conflict areas (top graph) in each of the following industries: agriculture and mining; manufacturing; utilities and public services; construction; transportation and storage; accommodation and food services; real estate, professional and technical services; other industries. We have removed wholesale and retail trade, which accounts for 50% of the NFE, as this does not differ between conflict and no-conflict regions. An asterisk next to the bar indicates that the difference between the two areas is statistically significant.

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1   An increase of about 100% is equivalent to an increase from 0.39 conflict events per capita (the average conflict intensity) to 0.78 conflict events per capita.

DOES CONFLICT INTENSITY INFLUENCE NFE BEHAVIOUR AND PERFORMANCE AND DOES THIS IMPACT DIFFER ACROSS MARKETS AND INDUSTRIES?

A 100% change of conflict events in a given area in the previous year has the following impact on NFE behaviour and performance (Figure 3):[2]

Table 1: Impact of conflict on NFE behaviour and performance

Behaviour	Performance
1. Capital invested: *reduces* by 58%	1. Sales: *reduce* by 62%
2. Amount of input/ supplies stocked: *reduces* by 55%	2. Profits: probability of being positive *reduces* by 40% points
3. Number of workers hired: *unchanged*	3. Labour productivity (amount of sales per labour costs): *reduces* by 58%
4. Number of months operating over the year: *increase* by 8%	

Figure 3: Impact of conflict intensity on NFEs' behaviour and performance

Conflict effect on for firms selling to businesses

Marginal impact of conflict events (%)

Legend: Capital, Inputs, Sales, Profits, Labor, Months of activity, Lab. Prod.

Notes: Each horizontal bar plots the effect of a 100% increase in conflict (for the average value of conflict) on the different behaviour and performance measures: capital, input stocks, number of workers, number of months in operation; profits, sales, and productivity. Data refer to 2010-2015 household surveys across Nigeria. Conflict intensity is measured as the number of conflict events per capita within 30km of the village where the household lives. An increase of about 100% is equivalent to an increase from 0.39 conflict events per capita (the average conflict intensity) to 0.78 conflict events per capita.

The impact on all NFE summarised in Table 1 differs across markets and industries. NFE selling to non-private buyers do not experience a reduction in sales. NFE selling to other firms do not disinvest (probably because they expect the demand to return to higher levels).

NFEs in the construction industry reduce sales more than others; NFE in the transport industry reduce profits less than others, while reducing the months activity.

Key findings:

Firms suffer the increase in conflict via a loss of sales, productivity and profits, leading to a reduction in capital and input investment. However, firms work even more under conflict, and maintain most of their labour (both from within and outside the household).

Conflict affects mostly NFE that sell to final consumers. Small differences emerge across industries.

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2   In general the impact is stronger on NFEs that experience conflict for the first time, than for those in areas that have experienced conflict before.
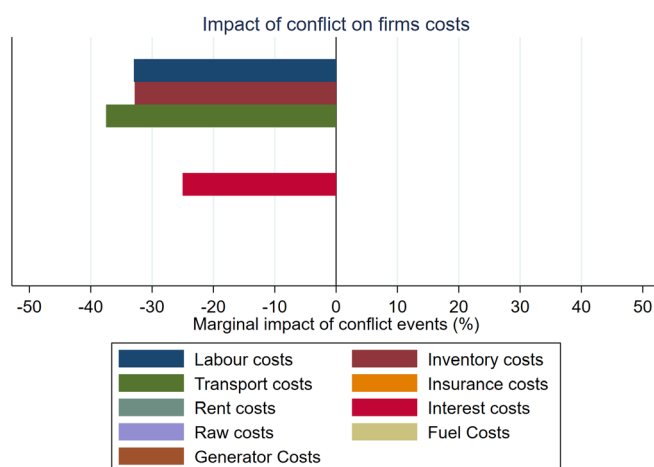
WHAT DRIVES THE IMPACT OF CONFLICT ON ENTREPRENEURSHIP? OPERATIONAL COSTS?

Because NFEs react to the fall in sales with a similar reduction in investment and inputs, the firm costs also reduce. Especially labour (-33%), inventory (-33%), transport (-38%), and interest (-25%) costs (Figure 4). Whereas inventory, transport, and interest are associated to a reduction in inputs, sales and capital, the fall in labour costs is more worrying, because it is not associated to a reduction in labour (Table 1). This suggests that firms pay their workers less in high conflict areas, perhaps due to increasing unemployment.
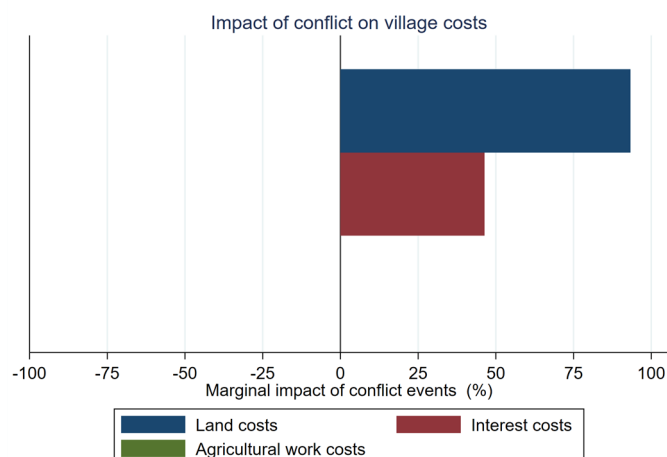
Is a reduction in firm expenditures associated with a reduction in input costs? Figure 5 suggests the opposite: a 100% increase in conflict events doubles the cost of land and increases by 50% the cost of capital, which may explain why firms reduce investment.

Figure 4: Impact of conflict intensity on NFEs' costs

Notes: Each horizontal bar plots the effect of a 100% increase in conflict (for the average value of conflict) on the different input costs: salaries and wages (labour costs), inventories, transport, insurance, rent, interests, and raw material. Conflict intensity is measured as number of conflict events within 30km of the village where the household lives. An increase of about 100% is equivalent to an increase from 0.39 conflict events per capita (the average conflict intensity) to 0.78 conflict events per capita.

Figure 5: Impact of conflict intensity on village's costs

Notes: Each horizontal bar plots the effect of a 100% increase in conflict (for the average value of conflict) on different costs: land, interest rate on loans, and agriculture labour. Conflict intensity is measured as number of conflict events within 30km of the village where the household lives. An increase of about 100% is equivalent to an increase from 0.39 conflict events per capita (the average conflict intensity) to 0.78 conflict events per capita.

WHAT DRIVES THE IMPACT OF CONFLICT ON ENTREPRENEURSHIP? FINAL DEMAND?

We have no definite answer on this question. On the one hand, firms cluster in areas with higher economic activity, which are also the most populated (Figure 6 a);[3] but these may also be areas of intense conflict, especially in peri-urban areas (Figure 6 b). On the other hand, although entrepreneurs concerned that conflict will impact on starting a NFE seem to prevail in areas with low demand (low nightlight density in Figure 7 a), the evidence is less neat with respect to running a NFE: entrepreneurs concerned with conflict seem to live both in areas of high and low demand (nightlight density, Figure 7 b).

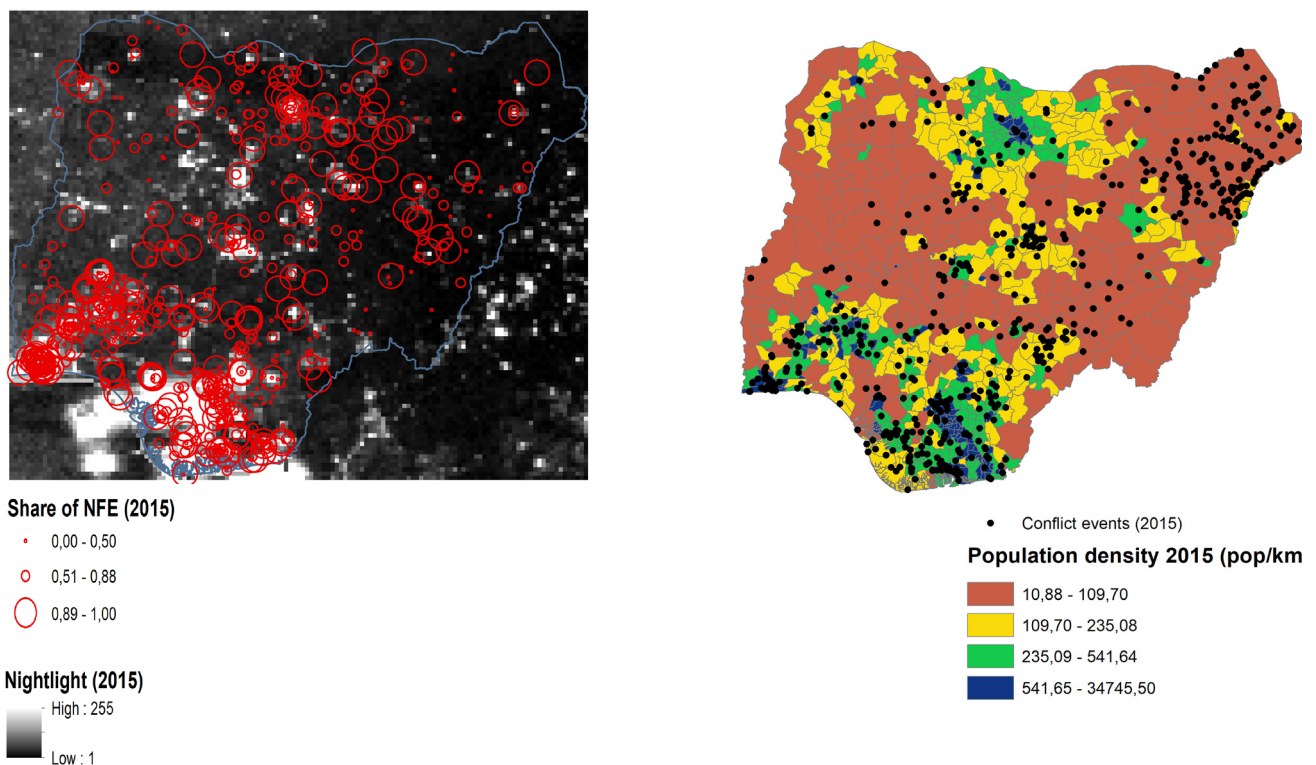## WHAT DRIVES THE IMPACT OF CONFLICT ON ENTREPRENEURSHIP? INSECURITY?

We distinguish between six categories of obstacles that entrepreneurs were asked to indicate as relevant to – and which might prevent them from – opening and running a NFE. Results suggest that conflict is not perceived by entrepreneurs as a relevant obstacle either to starting or operating a NFE (Figure 8). Not even 10% of surveyed entrepreneurs, in conflict or no-conflict areas, seem constrained by conflict. However, they seem constrained by poor infrastructures, access and cost of credit and access to market. All of which are worsened by conflict.

Key findings:

Entrepreneurs do not perceive conflict as a relevant obstacle to NFE start-up and operation. The main obstacles are access to credit, infrastructures and markets.

Impact on the cost of land and credit suggests that conflict worsen those conditions, increasing the obstacles to entrepreneurship and reducing NFE performance.
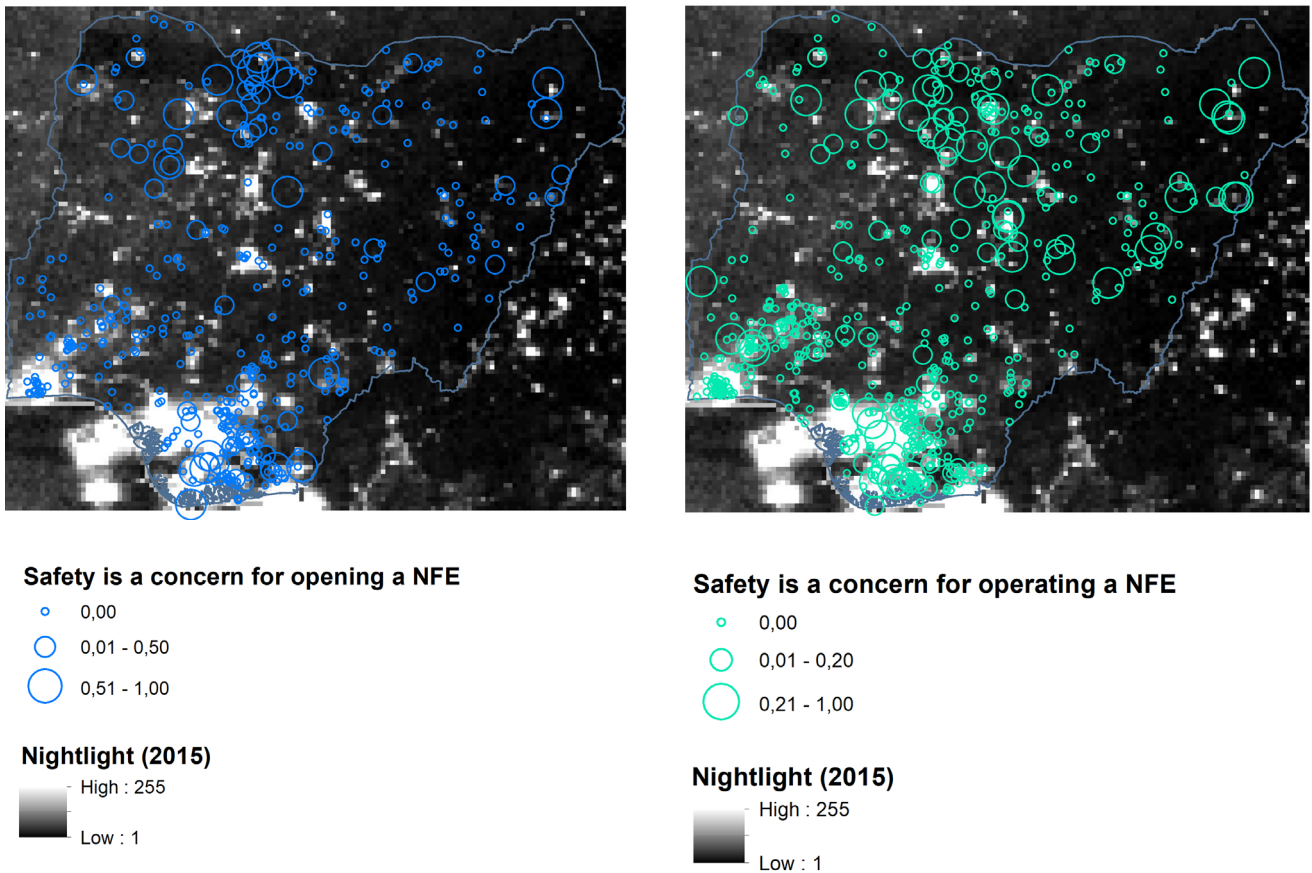
Figure 6: Economic activity (nightlights), population density, NFEs, and conflict events

Share of NFE (2015)

- ·   0,00 - 0,50
- ○   0,51 - 0,88
- ◯   0,89 - 1,00

Nightlight (2015)

High : 255

Low : 1

•   Conflict events (2015)

Population density 2015 (pop/km

- 10,88 - 109,70
- 109,70 - 235,08
- 235,09 - 541,64
- 541,65 - 34745,50

Notes: The graph on the left (a) plots the nightlight density for Nigeria in 2015 (from satellite images) and the share of NFEs in the areas in which the household survey was run. The graph on the right plots again the population density by district and the number of conflict events (each black dot is one event); the different colours indicate four different levels of population density, from low (red) to high (blue).
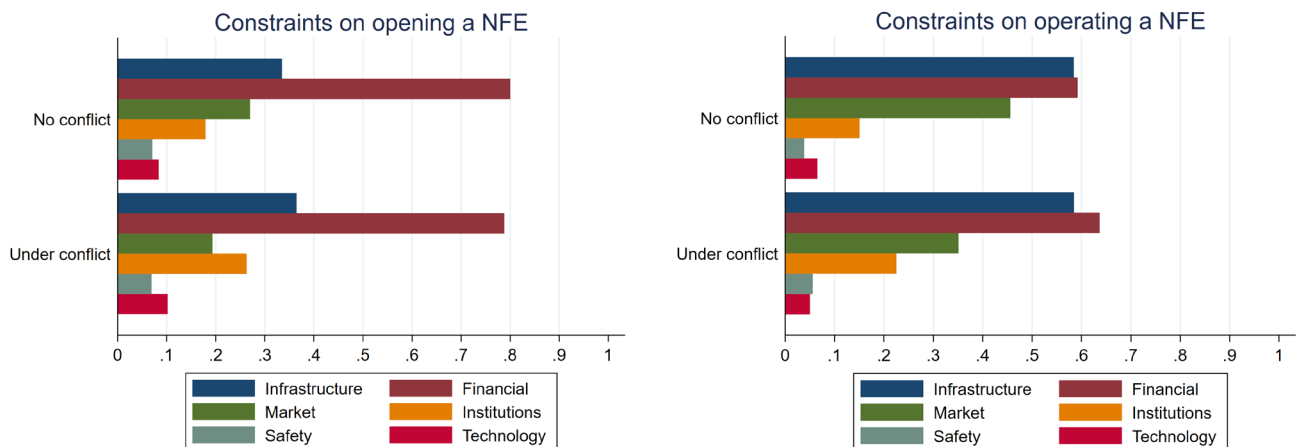
3   Economic activity in the figure is proxied by nightlights observed by satellites, which provides a good measure of the use of electricity

Figure 7: Economic activity (nightlights) and the share of entrepreneurs that indicate conflict as an obstacle

Safety is a concern for opening a NFE
- 0,00
- 0,01 - 0,50
- 0,51 - 1,00

Nightlight (2015)
High : 255
Low : 1

Safety is a concern for operating a NFE
- 0,00
- 0,01 - 0,20
- 0,21 - 1,00

Nightlight (2015)
High : 255
Low : 1

Notes: The graph plots the nightlight density for Nigeria in 2015 (from satellite images) and the share of NFEs that indicate conflict as a relevant obstacle.
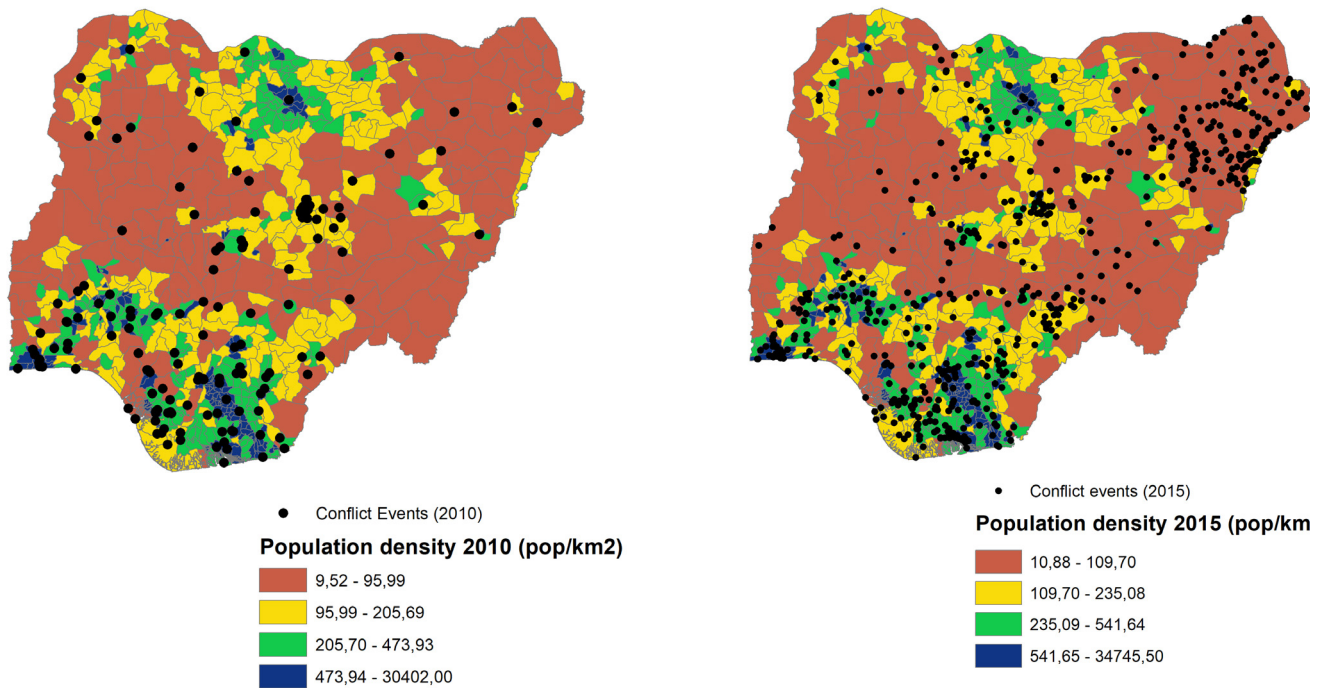
Figure 8: Relative importance of obstacles perceived by households to open (a) and run (b) a NFE

Notes: entrepreneurs were asked to rank the three most relevant obstacles among the six categories listed above (Infrastructures (16 obstacles), Financial (5 obstacles), Markets (3 obstacles), Institutions (8 obstacles), Technology (4 obstacles), Safety (2 obstacles)). We include all obstacles listed in any of these category, irrespective of its ranking. Because entrepreneurs could name three obstacles, the sum of the percentages can be above 1.
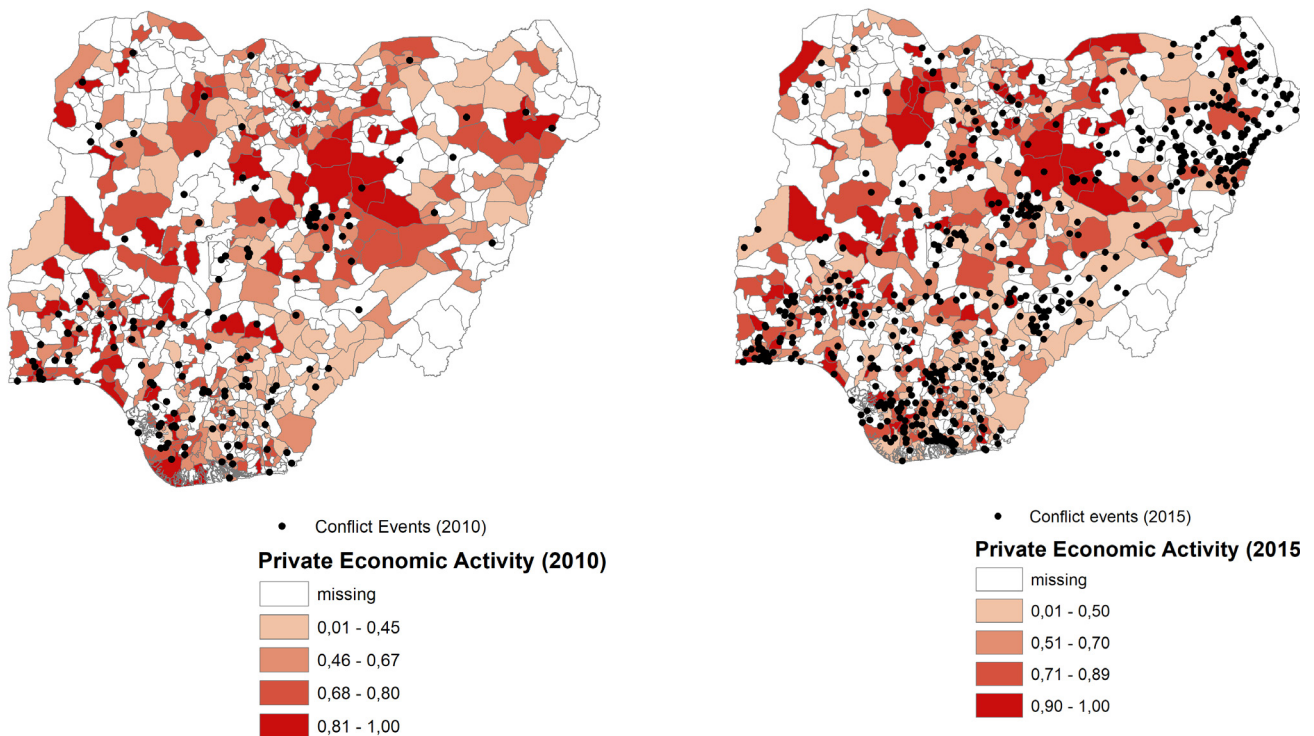
ANNEX OF FIGURES

Figure A: Conflict and population density (2010-15)

- Conflict Events (2010)

Population density 2010 (pop/km2)

▨	9,52 - 95,99
▨	95,99 - 205,69
▨	205,70 - 473,93
▨	473,94 - 30402,00

- Conflict events (2015)

Population density 2015 (pop/km

▨	10,88 - 109,70
▨	109,70 - 235,08
▨	235,09 - 541,64
▨	541,65 - 34745,50

Notes: the different colours indicate four different levels of population density, from low (red) to high (blue). Each dot indicates a conflict event in the given year. The map on the left reports population and conflict density in 2010; the map on the right reports population and conflict density in 2015.

Figure B: Conflict and entrepreneurship density (2010-15)

- Conflict Events (2010)

Private Economic Activity (2010)

☐	missing
▨	0,01 - 0,45
▨	0,46 - 0,67
▨	0,68 - 0,80
▨	0,81 - 1,00

- Conflict events (2015)

Private Economic Activity (2015

☐	missing
▨	0,01 - 0,50
▨	0,51 - 0,70
▨	0,71 - 0,89
▨	0,90 - 1,00

Notes: the different colours indicate four different levels of entrepreneurship density, from low (light pink, when less than 50% of the households in the district own a NFE) to high (dark red, when at least 90% of the households in the district own a NFE). White districts indicate that no village was surveyed. Each dot indicates a conflict event in a given year. The map on the left (a) reports entrepreneurship and conflict density in 2012; the map on the right (b) reports population and entrepreneurship density in 2015.

OPEN CONCLUSIONS AND DISCUSSION

- There is evidence that conflict intensity in Nigeria has a negative impact on:

  a) The probability that a households owns a NFE

  b) NFE behaviour and performance: reduced investments, sales and profits

- NFE that do not sell mainly to the final demand fair slightly better, especially in transport

- Despite the observed negative impact, entrepreneurs do not see insecurity as a major obstacle to starting or operating a NFE.

However, the impact on NFE seems related to an increase in costs and a reduction in demand which may be driven by conflict. The evidence discussed in these pages leaves open for interpretation several questions, among which:

- Why do firms hoard workers? Notice that there seems to be no difference between household and external workers

- Is the labour hoarding and increase in self-employment a consequence of lower employment opportunities elsewhere in the economy?

- Why do firms that do not sell to final consumers do better? Is demand less affected?

- Why does the transport industry do better under conflict?

- Why are NFEs selling to other businesses (rather than final consumers or public sector) increasing capital stock and input stock when conflict rises?

- Is the decrease in variable costs, including labour, inventory and insurance due to a decrease in the use of inputs? Or might conflict actually decrease the cost of inputs, perhaps because of reduced demand (excess supply)?

- Why do NFE owners not consider conflict as a major obstacle, if it has such a strong impact on NFE behaviour and performance? Because it merely worsens obstacles that are also present when there is no conflict?

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