# Arms Trade and Conflict

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# Overview

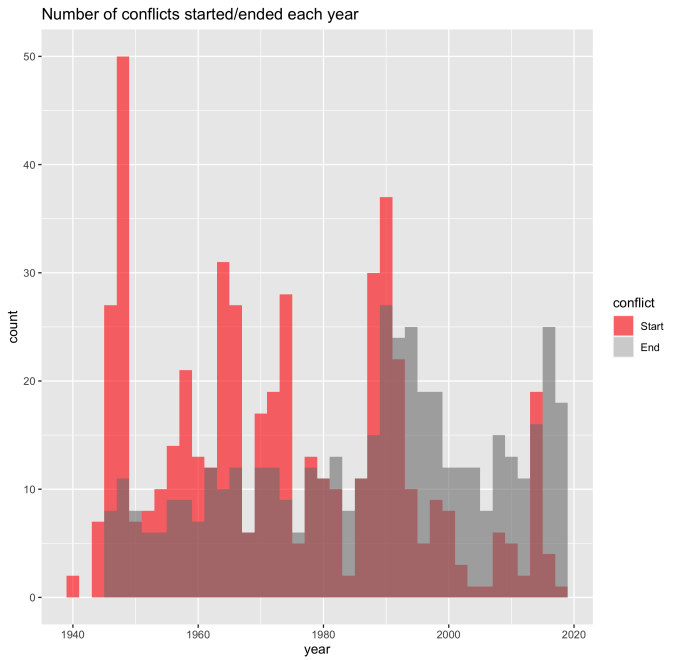
# Overview

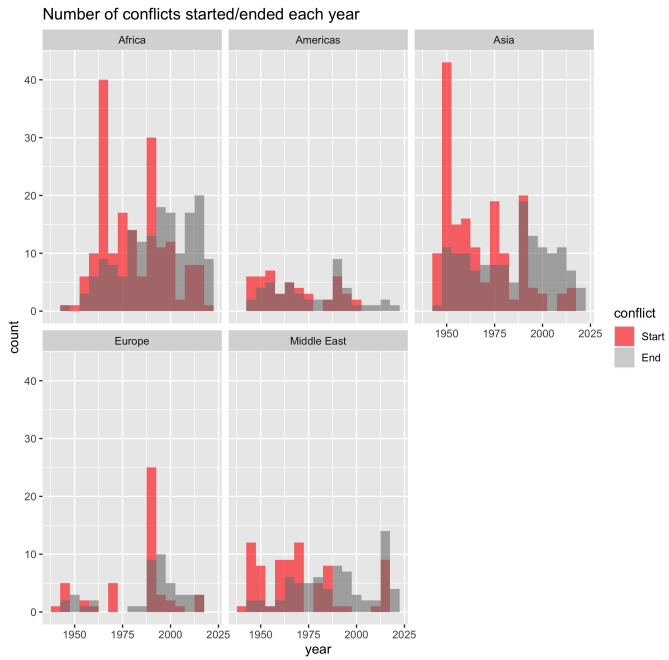
1. The effect of weapons on conflicts
2. IV approach
3. Model of supply and demand

# Background

# Facts

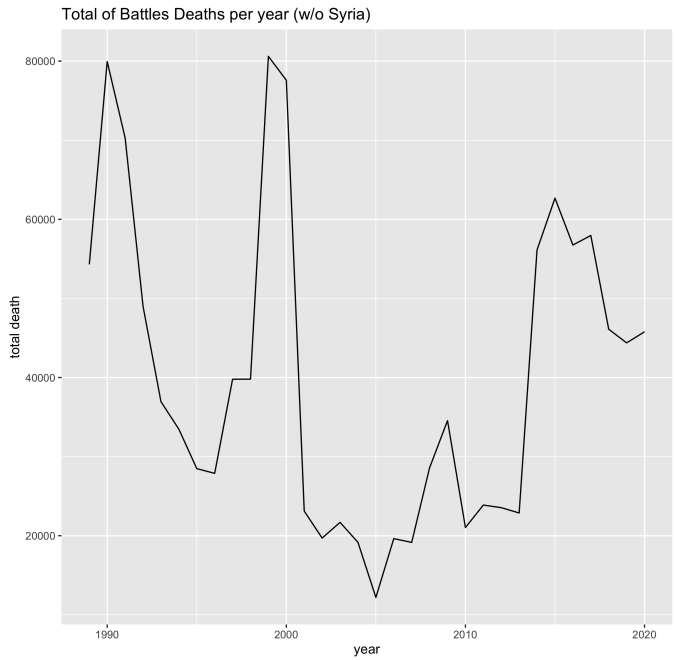
## 1. Conflicts are ending

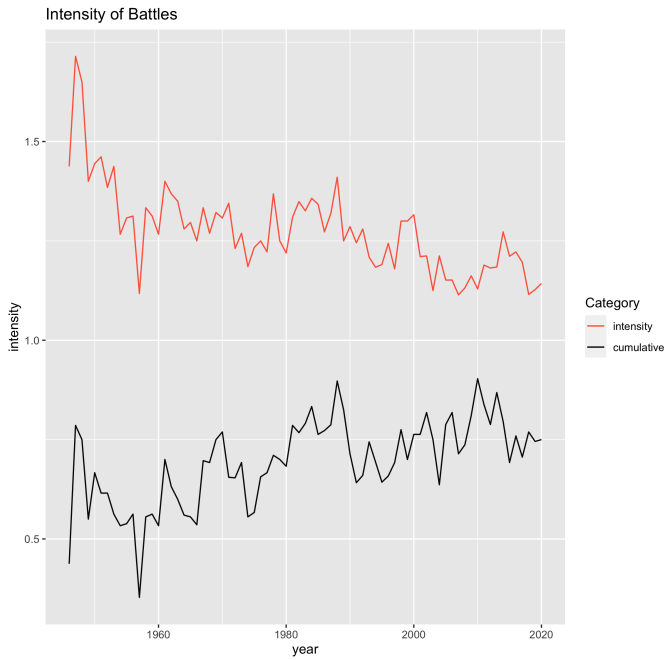


# Facts

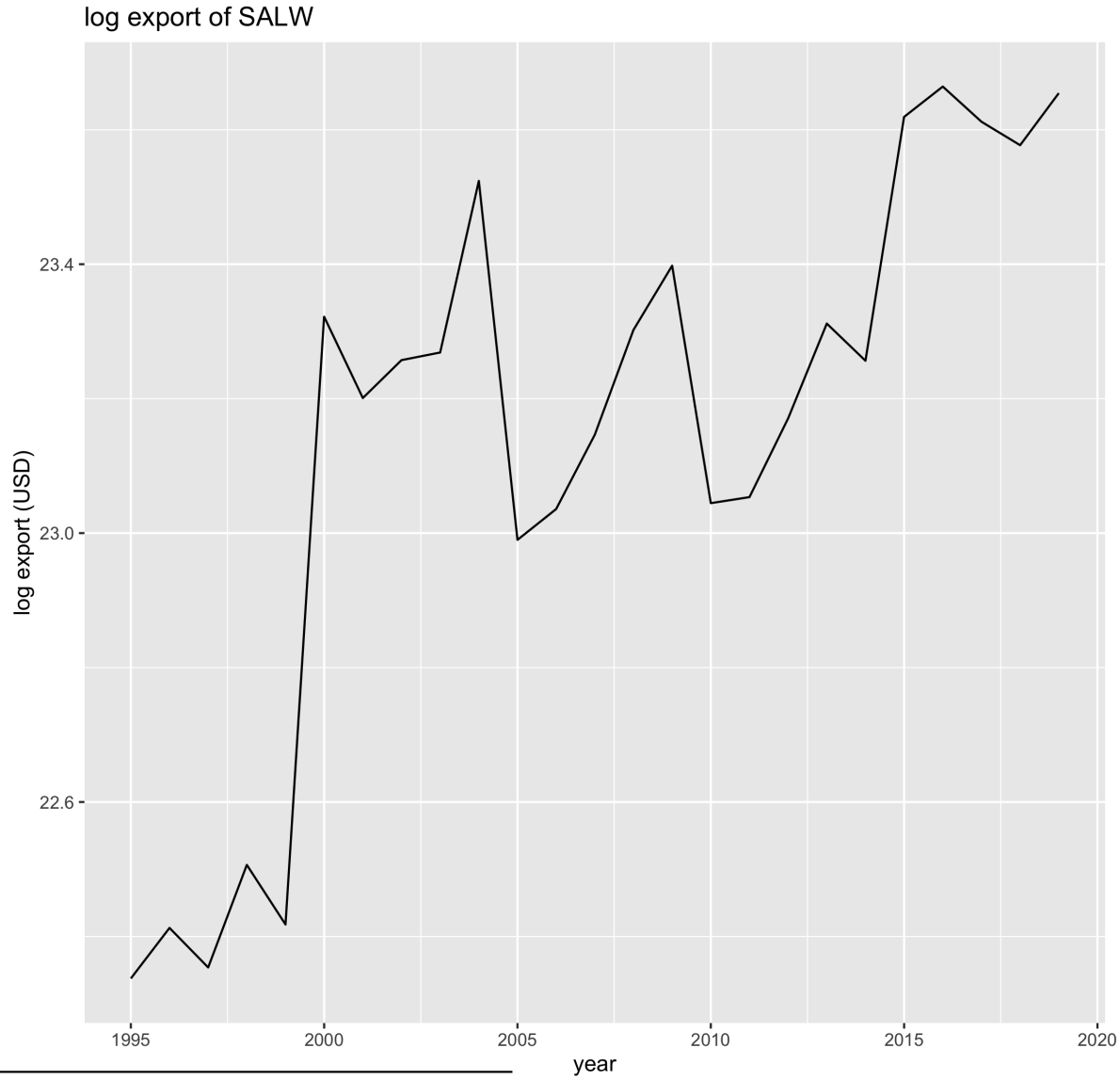
## 2. Less deadly?



# Facts

3. More weapons.[1]




[1] SALW for *Small Arms and Light Weapons*

# Question

- The effect of weapons on ongoing conflicts.
  - Worsen Conflict?
  - Deterrence?

# Hypothesis

- Additional supply of weapons worsens conflicts.

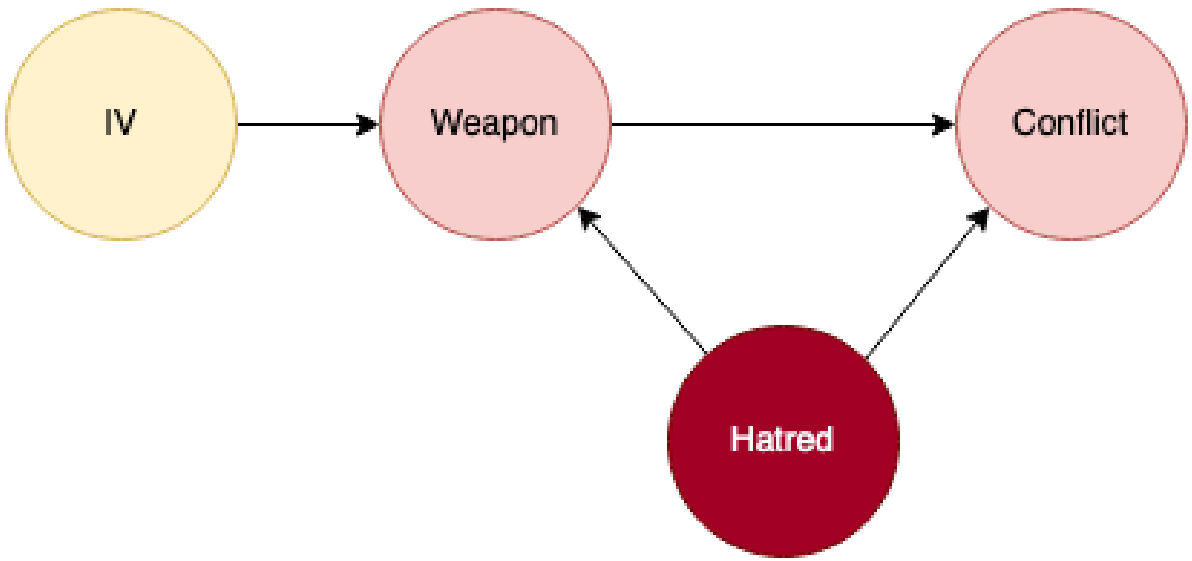
# Empirical test

# Why IV

1. Increase in weapons affects conflicts.

2. More intense conflicts increase demands for weapons.

3. Confounding variables such as hatred.



# IV

Use end of conflicts in other region as an IV.

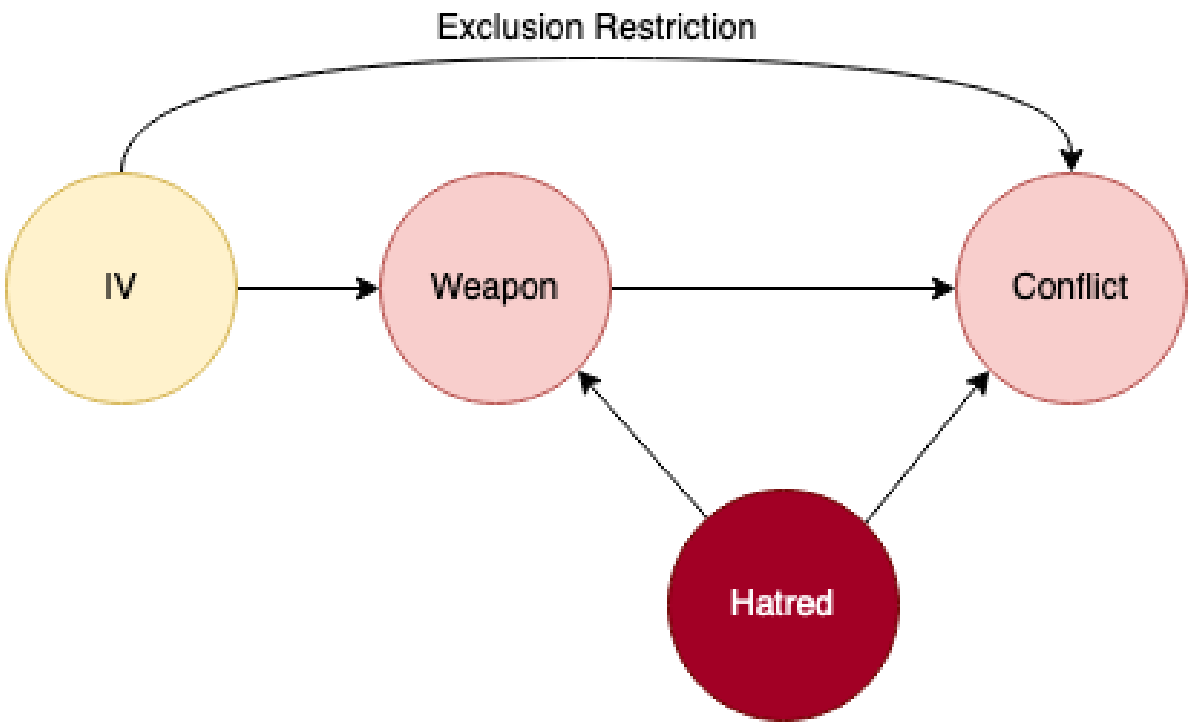
# Logic

1. Conflict ends in country A. $\rightarrow$ Demand for weapons in A goes close to 0 (Assumption).
2. Market of weapon reacts. $\rightarrow$ Price of weapon goes down.
3. Other buyers in country B can buy more.
4. Suppliers provide more weapons to those buyers.
5. There will be more weapons in country B.

# Exclusion Restriction

Africa's timing of end of war would not affect India's war other than changes in the weapon market.

1. Migration, Services etc.
2. Peace building activities? Other trade?



# Data

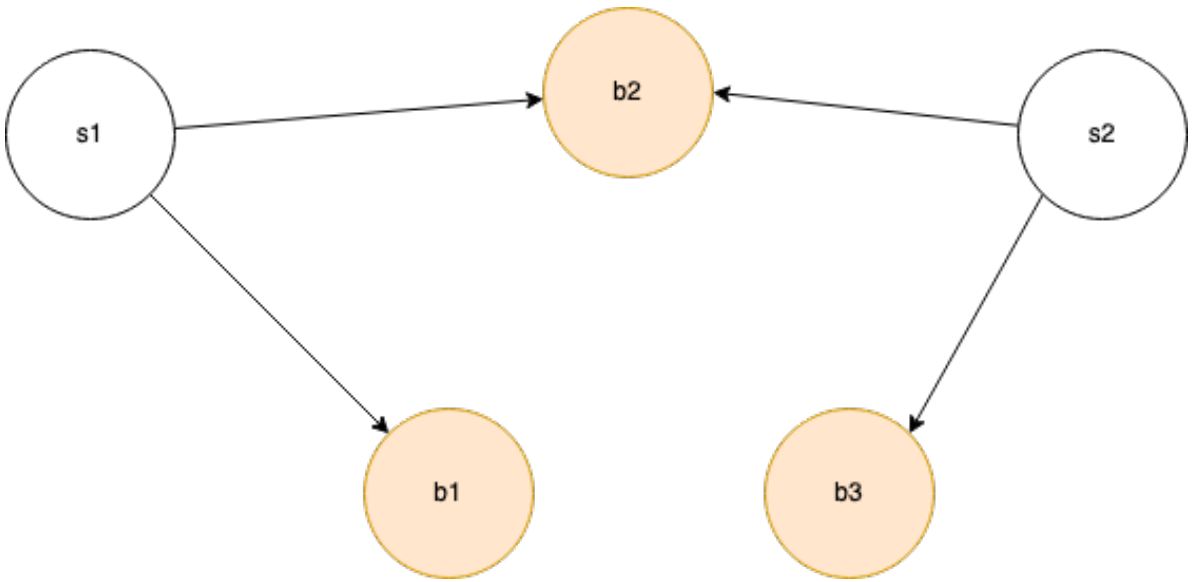
1. UCDP/PRIO (Conflict)
2. US COMTRADE (Trade)
3. Problem: Only USD. Cannot distinguish between price $\downarrow$ and quantity $\uparrow$.

# Model

# Fixed Network - Setup

- Two suppliers (s1 & s2) and Three buyers (b1, b2 & b3)

- Assumptions
  - Entire network is common knowledge
  - Compete on quantity



# Fixed Network - Setup

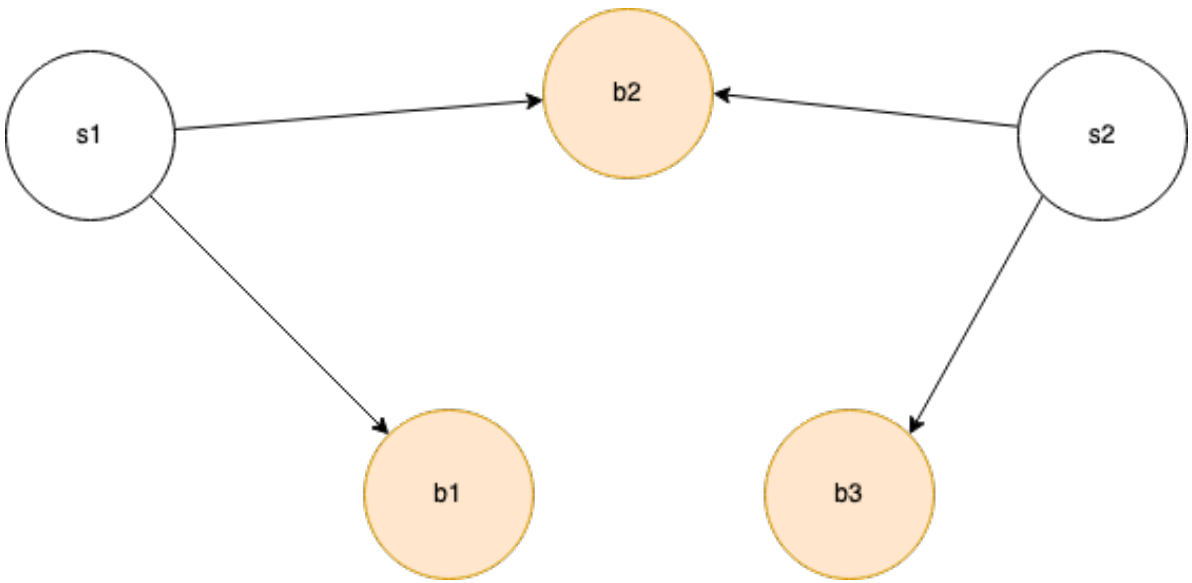
Firm's profit is

$$\pi_s(a) = \sum_{b \in \boldsymbol{B}} g_{s,b} P(q_b) q_{s,b} - C_s(a) \tag{1}$$

$$P_b(q_b) = \alpha - \beta q_b \tag{2}$$

$$C_s(a) = c q_s^2 \tag{3}$$

where $a = (q_{s,b1}, q_{s,b2}, q_{s,b3})$, $B = \{b1, b2, b3\}$, $g_{s,b} = \{0, 1\}$, $q_b = q_{s1,b} + q_{s2,b}$, and $q_s = q_{s,b1} + q_{s,b2} + q_{s,b3}$.

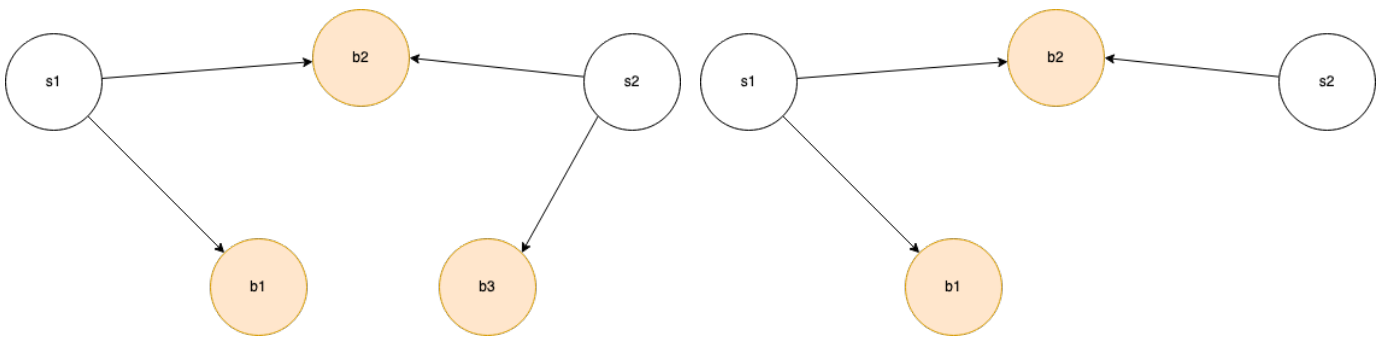


# Fixed Network - Change of environment

$$q_{s_1,b_2} = q_{s_2,b_2} = \frac{\alpha}{5c + 3\beta} \tag{4}$$

$$q'_{s_1,b_2} = \frac{\alpha}{8c + 3\beta} \tag{5}$$

$$q'_{s_2,b_2} = \frac{\alpha\beta + 4\alpha c}{3\beta^2 + 8c^2 + 11\beta c} \tag{6}$$



# Fixed Network - Result (potential)

1. If number of buyers decreases, supplier will supply more to existing buyers

2. The difference will be stronger for those that were linked by suppliers before.

# $g_{s,b}$?

For fixed network, similar to gravity model

$$\frac{ArmsIndustry_s * BattleIntensity_b}{Distance_{s,b} * Preference_{s,b}} \tag{7}$$

# Refinement

1. New matching depends on which conflict ended.

2. Conflict environment $\rightarrow$ Franke and Öztürk [2015], König et al. [2017]

3. Incomplete information $\rightarrow$ Bargaining? Search Theory? Peters [1994]

# Refinement (idea)

1. Buyers optimize their quantity based on its conflict and expected linkage to suppliers.

$$\pi_b = \sum_{j \in \mathbf{B}/\{i\}} p_{ij} V - \sum_{j \in \mathbf{B}/\{i\}} p_{ji} V - C(a) \tag{8}$$

$$p_{ij} = \frac{q_i}{q_i + q_j} \tag{9}$$

2. Suppliers have preferences based on friendship, distance etc. (this preference list will change after the end of some conflict)
3. Buyers who many suppliers have high preference can demand the price to go down. (proportional to degree of buyer?)
4. Trading is complete and buyers get payoff.

# References I


Jörg Franke and Tahir Öztürk. Conflict networks. *Journal of public economics*, 126:104–113, Jun 2015. doi: 10.1016/j.jpubeco.2015.04.002.

Michael D. König, Dominic Rohner, Mathias Thoenig, and Fabrizio Zilibotti. Networks in conflict: Theory and evidence from the great war of africa. *Econometrica*, 85(4):1093–1132, 2017. doi: 10.3982/ecta13117.

Michael Peters. Equilibrium mechanisms in a decentralized market. *Journal of Economic Theory*, 64(2):390–423, /12/01 1994. doi: 10.1006/jeth.1994.1074. URL https://www-sciencedirect-com.utokyo.idm.oclc.org/science/article/pii/S002205318471074X.