Relationships Between Firms

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Comments Welcome !

IOEA School
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Motivation: Why Study Relationships?

- **IO**: roughly 50% if (U.S.) GDP is acocunted for by transactions in intermediate good markets. Yet we know relatively little about B-to-B transactions and how intermediate markets work
- **ORG**: two views of the world
  - Dichotomy between "markets" & "hierarchies" (early Williamson)
  - Stable "hybrid" organizational forms (late Williamoson)
- **DEV**: might be particularly important ...
  - "markets" do not work well due to poor institutional infrastructure
  - "firms" also are constrained and cannot grow (e.g., Hsieh-Klenow, Bloom et al.)

  $\rightarrow$ possibly an even larger share of transactions occur within relationships
- Important also in *trade* (a new margin), *macro* (e.g., price transmission, role of organizational/customer capital in recessions), *finance* (e.g., trade credit).

What do we know?

- I am not aware of systematic facts about how much trade occurs within relationships (as opposed to firms and markets).
- Best data come from either customs, VAT, regulated industries:
  - Customs: U.S. imports 45% in relationships $\geq$ 3 years
  - VAT (**not yet**, but quite a few people working on it)
  - Regulated Industries:
    - Costa Rica Coffee: 40% **F**, 40% **R**, 20% **M**
    - Peru Anchovies: 60%, 30%, 10%

    NB: probably lower bounds, as these are commodity-like goods (*are they?*) and we expect relationships to be more important customized/specific intermediate goods (*do we?*)
- A lot of evidence from case studies and from related disciplines
  - Supply-chain studies in OR and Marketing (not reviewed here)
- There are well-developed literatures for other "relationships"
  - Bank-Firms (not reviewed here)
  - Employer-Employee (not reviewed here)

What should we know?

- Between firms behaviour different from EC101 markets.
  - Why?
  - Does it matter?

- Two analogies:
  - Empirical Literature on organizational forms (e.g., vertical integration)
    - Q1: What drives VI? Q2: What are its consequences?
    - Q1 is easier. Q2 not very well suited to reduced form?

  - Empirical Literature on contracts/ass. info (Chiappori-Salanie')
    - Role of theory
    - Develop tests to infer relevant contractual frictions in specific environments $\rightarrow$ policy

(Selected) Related Literature

- McMillan & Woodruff (1999) on trade credit in Vietnam and Banerjee & Duflo (2000) on software industry in India
  - cross-section only; survey data on main supplier/customer
  - (see also Banerjee and Munshi (2004), Munshi (2012))
- Macchiavello (2010) on Chilean wines in UK
  - Match export transactions with wine distirbutor in UK
  - As relationship with distributor ages FOB prices for the *same bottle* $\uparrow$
  - Evidence of learning about seller and importer specialization
- Antras & Foley (2015)
  - Data from one US exporter of frozen chicken
  - As relationship with foreign importer matures, trade credit is provided
  - Contract depends on quality of institutions in importers country
- Eaton et al. (2014), Monarch and Smith-Eisenlohr (2016)
  - structural approach on U.S. imports
  - A lot more work going on in *trade* nowadays
- (Somewhat o.o.d.) Survey by Slade & LaFontaine (2009)

Why do Firms Trade Repeatedly ?

- Fundamentally we can think of two sets of reasons why firms might repeatedly trade with each other:
  - **Transactions Costs**
    - AS, MH, No enforcement, search costs
  - **Transactions Costs**:
    - Relationship Specific Capabilities/Learning
- Today:
  1. One paper in detail $\rightarrow$ Flowers in Kenya
  2. Mention other papers / W.I.P. / ideas for research ...

Motivation

- Imperfect CE a pervasive feature of real-life commercial transactions $\rightarrow$ parties rely on informal mechanisms to guarantee contractual performance (e.g., Greif (2005), Fafchamps (2010)) $\rightarrow$ LTR based on trust or reputation the most widely studied theoretically.
- Variety of models capturing salient features:
  - enforcement problems (e.g., Malcomson-McLeod (1989), Baker et al. (1994, 2002), Levin (2003))
  - insurance considerations (e.g., Thomas and Worrall (1988)),
  - or uncertainty over parties commitment to the relationship (e.g., Gosh and Ray (1996), Halac (2012)).
- Different models share the common insight that **future rents** are necessary to deter short-term **opportunism**
- Empirical evidence has the potential to identify which frictions are most salient in a particular context $\rightarrow$ policy (particularly in LDCs)

Empirical Challenges

- Empirical progress in the area, however, has been limited
  1. Paucity of data on transactions between firms in environments with limited or no formal contract enforcement
  2. challenges in measuring future rents / beliefs.

- One approach:
  - use reference price to infer **IC** (side-selling*)
  - A (negative supply) **shock**

- This particular paper:
  - use export sales (unlike domestic sales, recorded by customs)
  - Survey of firms to understand how industry works and how firms reacted to shock (what goes in the ϵ ?)
  - But no structural estimation $\rightarrow$ no counterfactual

The Paper

- Features of the industry (**"Section 2"**)
- Model
  - Why do you write a model in an empirical paper?
- Three empirical tests (from the model)
  - Does IC bind?
  - Is RC stationary?
  - Why not?

The Kenyan Flower Industry

- Kenya Roses
- Roses are fragile and perishable $\rightarrow$ coordination along supply chain is crucial.
- Seasonal business: demand (e.g. Valentines day and Mothers day) and supply (it is costly to produce roses in Europe during winter)

Contractual Practices

- Roses are exported in two ways: Dutch Auctions & Direct Buyers
- Dutch Auctions as textbook Walrasian market:
  - consolidating demand and supply
  - platform and mechanism to enforce contracts
  - Exporters keep open accounts at the auctions (even those that sell most production through direct relationships)
- Formal CE is missing in the direct relationships
  - Export nature of transaction + high perishability of roses makes it impossible to write and enforce contracts on supplier's reliability.
  - Exporters do not write (complete) contracts with foreign buyers.
    - 32/74 surveyed producers had a written contract with their main buyer.
    - $\leq$10/32 had any written provision on the volumes/quality/schedule of deliveries
    - *quote*

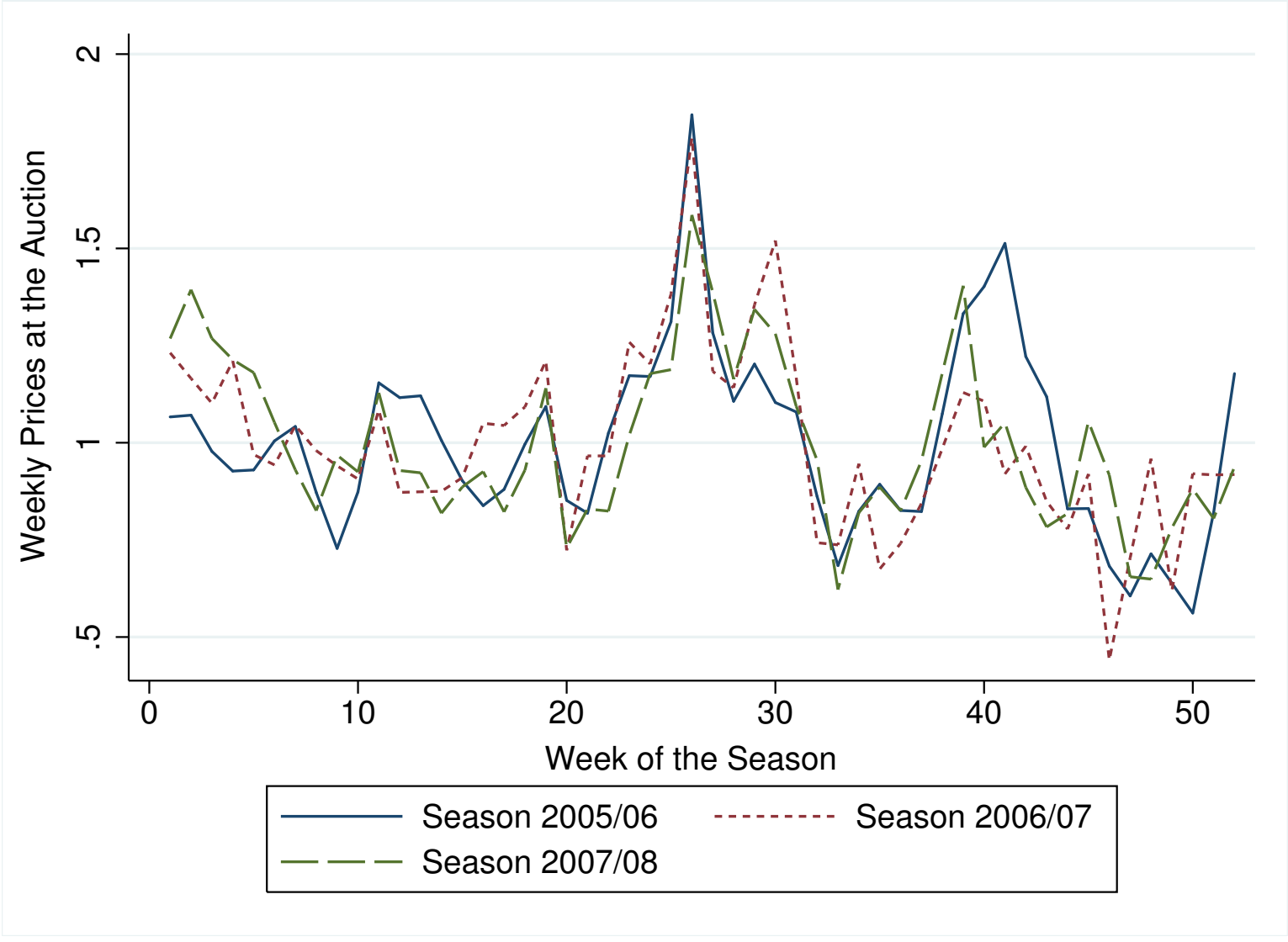
Why Relationships?

NB Take existence of direct relationships as given (does not explain coexistence)

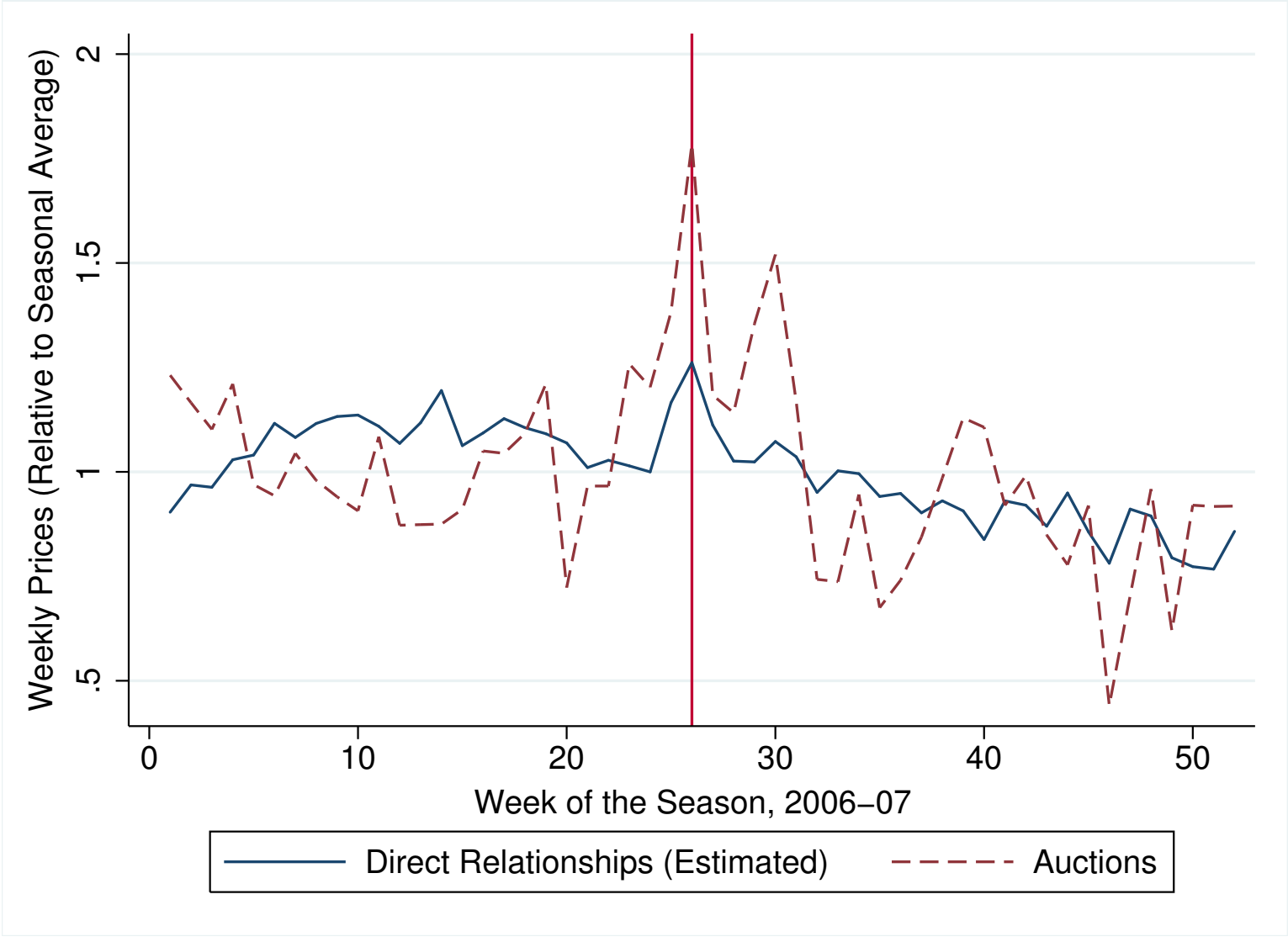
- Similar market structures in several markets in developing countries (see **?** for a review) and contexts (perishable agricultural commodities, advertising, diamonds...)
- Given seasonality and cost structure: what would a planner do?

- Beside lower freight and time costs, a well-functioning relationship provide buyers and sellers with stability.
  - Demand and Supply Assurance concerns
- Parties trade-off these benefits with the costs of managing and nurturing direct relationships in an environment lacking CE.

Predictable Fluctuations in Spot Prices



Fluctuations in Prices



IC

- Buyer (high and low season)

$$\delta\left(\underline{U}_{t+1} - \underline{U}^{O}_{t+1}\right) \geq w_t \times \overline{q}_t \text{ for all } t = 0, 2, ... \tag{1}$$

$$\delta\left(\overline{U}_{t+2} - \overline{U}^{O}_{t+2}\right) \geq w_t \times \underline{q}_{t+1} \text{ for all } t = 0, 2, ... \tag{2}$$

- Seller (high and low season)

$$\delta\left(\underline{V}_{t+1} - \underline{V}^{O}_{t+1}\right) \geq \left(\overline{p} - w_t\right)\overline{q}_t \text{ for all for all } t = 0, 2, ... \tag{3}$$

$$\delta\left(\overline{V}_{t+2} - \overline{V}^{O}_{t+2}\right) \geq -\left(w_t \times \underline{q}_{t+1}\right) + c(\underline{q}_{t+1}) \text{ for all } t = 0, 2, ... \tag{4}$$

IC

- (After some manipulation) we have:

$$\delta\left(\underline{S}_{t+1}^{R}\right) \geq \overline{p}_t \times \overline{q}_t \tag{1}$$

Empirical Results: Roadmap

- Notation and Computing Relationship Value
- Three tests derived from the theory:
  - *i*) is the volume of trade constrained by lack of enforcement? (*Test 1*);
  - *ii*) does the value of the relationship increase with age? (*Test 2*);
  - *iii*) are deliveries during the violence an inverted-U shaped function of relationship's age? (*Test 3*).
- Direct evidence of effort exerted by sellers to protect relationships during the violence.

Incentive Constraints and the Value of Relationships

- IC constraint is the key (for empirical test, but also in general for these models ...)
- Appeal of IC is that volumes of roses traded in the relationship $\overline{q}_t^R$, and auction prices, $\overline{p}$, are directly observable in the data.
- This allows us to:
  - Test if IC is binding
  - Compute (lower bound to) Value of the relationship
- ... w/out relying on information on cost structures, expectations of future trade, etc. which are typically unobservable and/or difficult to estimate.

Incentive Constraints and the Value of Relationships

- Denote $q^R_{i,t\omega}$ the quantity traded in relationship i and $p_{i,t\omega}$ the relevant auction price in week ω of season t.
- Auction prices, $p_{i,t\omega}$, are indexed by i (different relationships trade different types of roses (only weight observed))
- Model implies only IC corresponding to maximum temptation in each season matter $\rightarrow$ focus on time when value of roses traded in relationship valued at market prices is highest.
- What is a season? Model is two periods; in practice 52 weeks $\rightarrow$ taking model to the data we need to choose length of "deviation period" $\rightarrow$ chose a week and show results are robust.

Incentive Constraints and the Value of Relationships

- Define week ω_{it}^* as the week of season t for which the value of roses traded in relationship i and valued at market prices $p_{i,t\omega}$ is highest:

$$\omega_{it}^* = \arg\max_{\omega} \left\{ q_{i,t\omega}^R \times p_{i,t\omega} \right\}. \tag{2}$$

- Lower bounds to value of relationship is then given

$$\widehat{S}_{it} = q_{i,t\omega_{it}^*}^R \times p_{i,t\omega_{it}^*}. \tag{3}$$

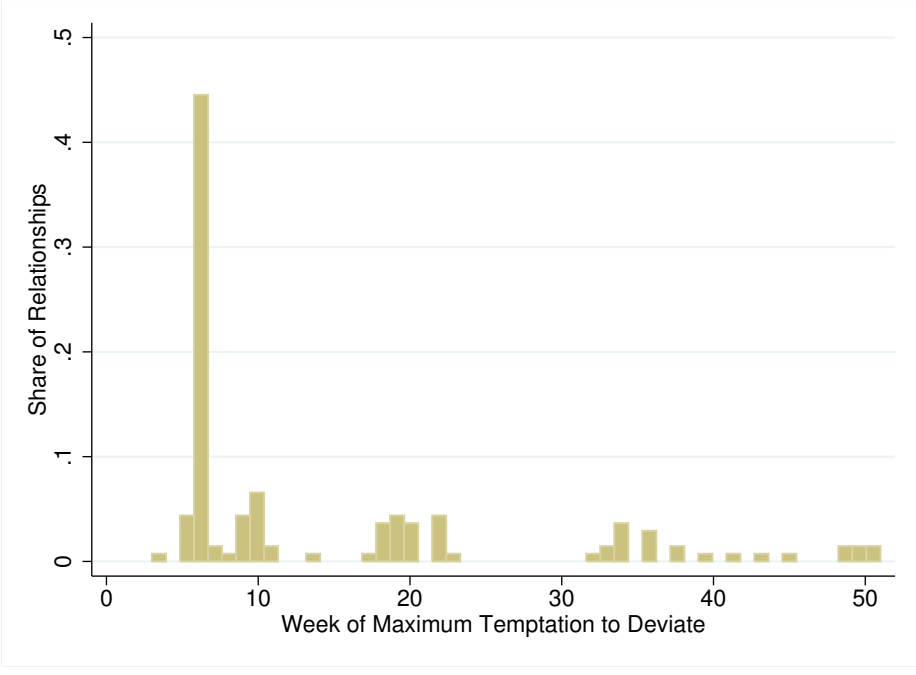
- We can define similar bounds for the buyer and seller.

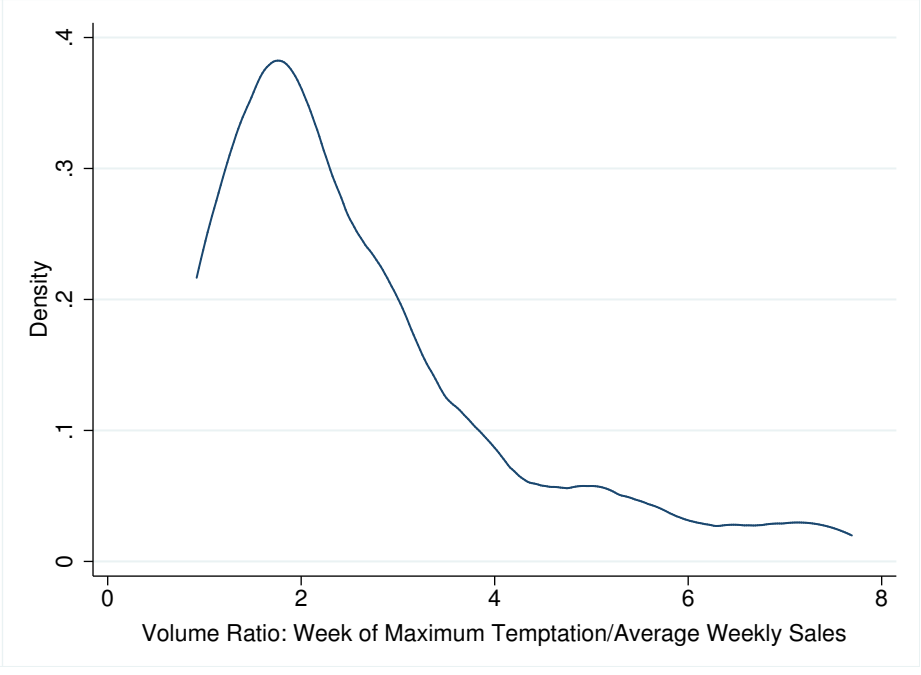
Incentive Constraints and the Value of Relationships

There are two main sources of variation in $\widehat{S}_{it}$:

i) the time of season t during which the market value of roses traded in relationship i is highest, ω_{it}^{*};

iii) the quantities transacted during the window ω_{it}^{*}, $q_{i,t\omega_{it}^{*}}^{R}$.





Incentive Constraints and the Value of Relationships

- For the 189 relationships in the baseline sample:
  - $\widehat{S}_{it} = 384\%$ of average weekly revenues
  - $\widehat{U}_{it} = 270\%$
  - $\widehat{V}_{it} = 161\%$

- Free-entry $\rightarrow$ initial sunk investments dissipate ex-post rents (see, e.g., Shapiro (1983)).
  - Estimates yield a lower bound to the fixed costs of starting a relationship
  - Can be compared to structural estimates of fixed costs of exporting
  - Das et al. (2007) in the Colombian chemicals industry, fixed costs of exports each year =1% of export revenues, initial sunk costs 18 to 42%.

Test 1: Binding Incentive Constraint

- A binding incentive constraint (IC) implies that lack of enforcement constrains the amount of flowers traded in the relationship.
- The future value of the relationship, $\widehat{S}_{it}$, does not depend on current auction prices.
- If IC is binding, therefore, a small unanticipated increase in prices at the auctions should lead to a corresponding decrease in the quantity traded.
- In fact: elasticity between $q^R_{i,t\omega^*_{it}}$ and $p_{i,t\omega^*_{it}} = -1$
- Furthermore, changing prices in the relationship would not help relaxing IC

Test 1: Binding Incentive Constraint

- Although much variation in auction prices is predictable, deviations from expected prices still occur.
- Future value of the relationship could depend on expectation of future prices.
- Control for both season and seasonality fixed effects
  - seasonality: week of the season ω_{it}^{*} from which estimates are derived
  - but also report results without controlling for season and seasonality fixed effects

Test 1: Binding Incentive Constraint

	(1)	(2)	(3)
Dependent Variable	Trade Volume	Relationship Value	Price
Price at auction (ln)	-0.936**	0.064	0.313
	(0.371)	(0.371)	(0.193)
Relationship fixed effects	yes	yes	yes
Season fixed effects	yes	yes	yes
Seasonality fixed effects	yes	yes	yes
Adjusted R^2	0.861	0.867	0.606
Observations	430	430	430

Test 1: Binding Incentive Constraint

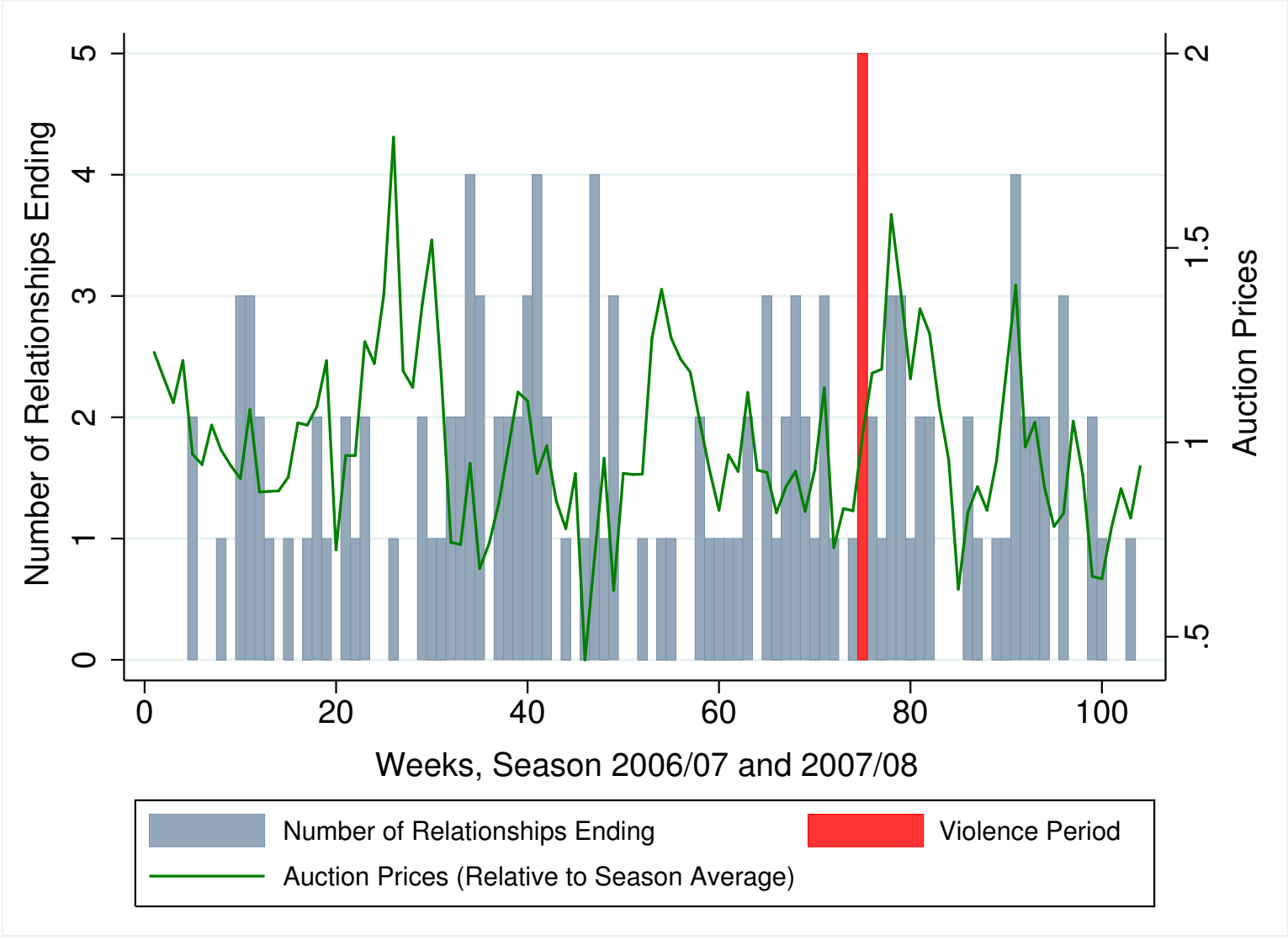
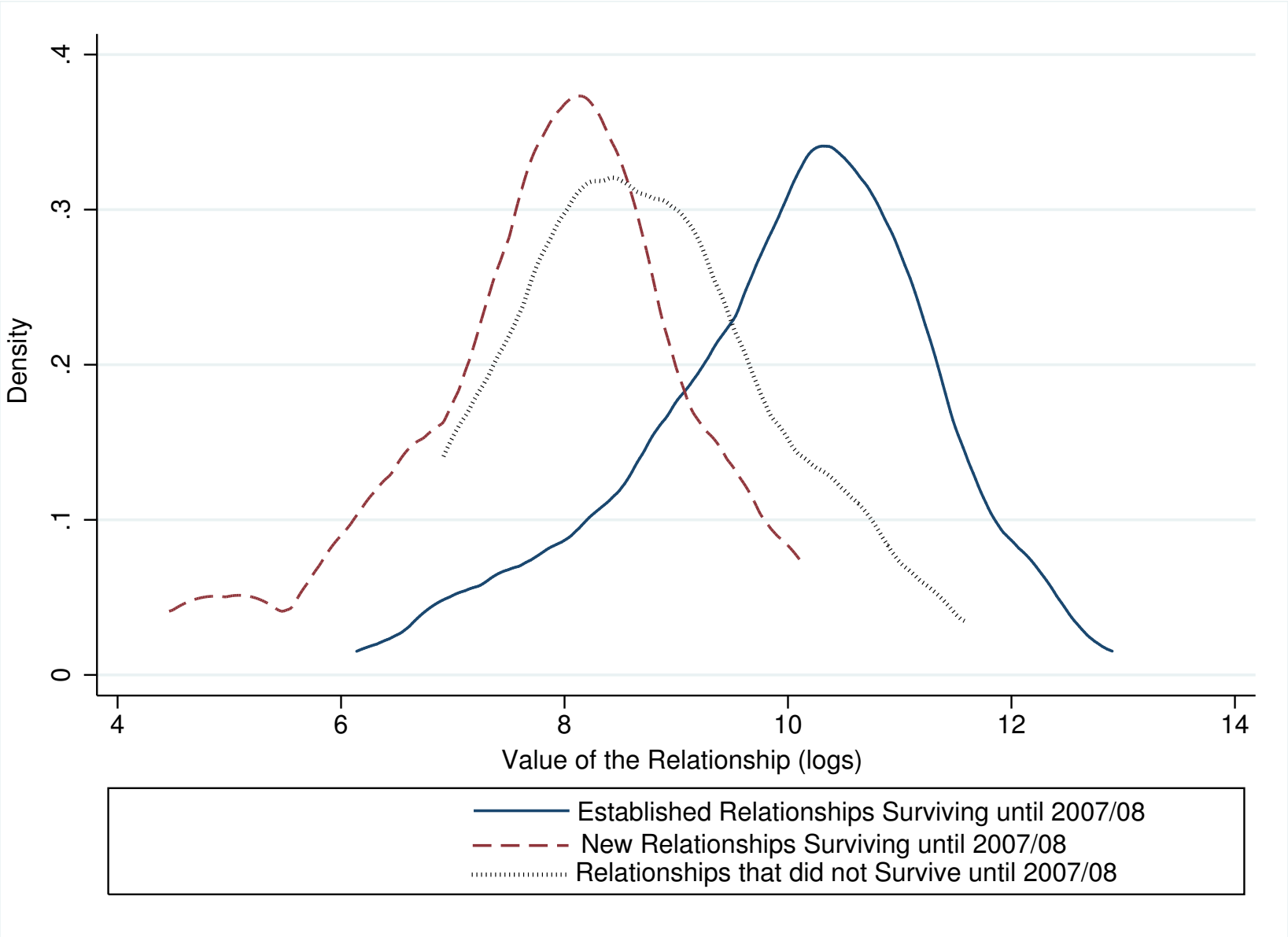


FIGURE 6 - RELATIONSHIPS DO NOT END WHEN AUCTION PRICES ARE HIGH

Test 2: Relationship's Value and Age

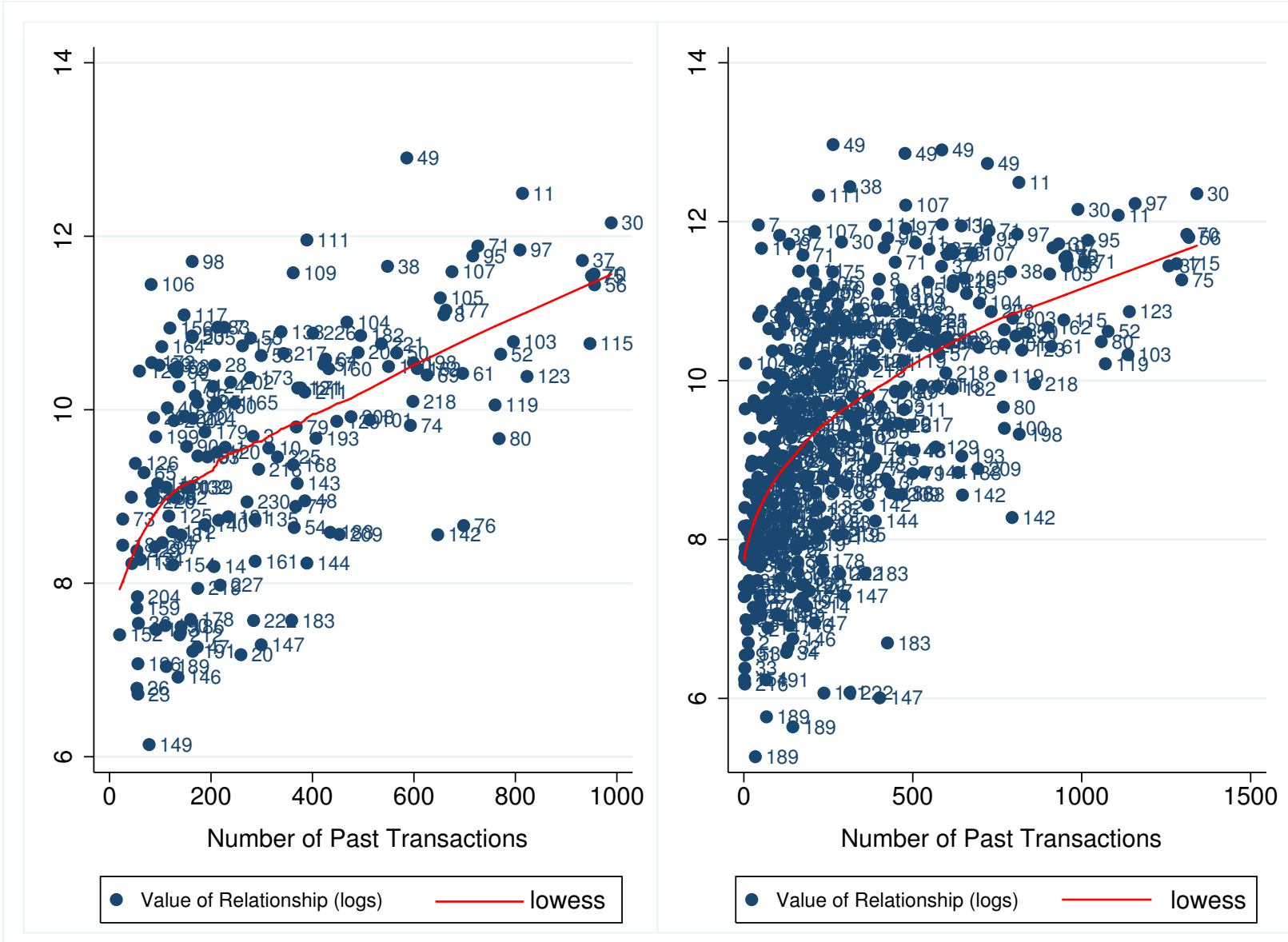


i) young relationships had lower values than established relationships;

Test 2: Relationship's Value and Age

- But:
  - Selection effects
  - Young relationships might not have gone through a peak
  - Relationship could be non-monotonic
- Two specifications
  - Cross-section
  - (Balanced) Panel

Test 2: Relationship's Value and Age



Reliability at the Time of the Violence

- Evidence rejects pure limited enforcement model (and supports model with learning)

- Positive correlation between relationship's age and outcomes, however, could be driven by factors other than learning about the seller's type.

- *Test 3*: How do relationships react to an unaticipated negative supply shock? Learning model points at two distinct mechanisms:
  1. The positive correlation between relationship age and value for the seller $\rightarrow$ sellers in older relationships have stronger incentives to exert effort during the violence and deliver roses to the buyers.
  2. In very old relationships, little uncertainty is left regarding the seller's type. Low reliability, then, would not lead to overly pessimistic beliefs about the seller's type and to termination of the relationship.

Test 3: Inverted-U

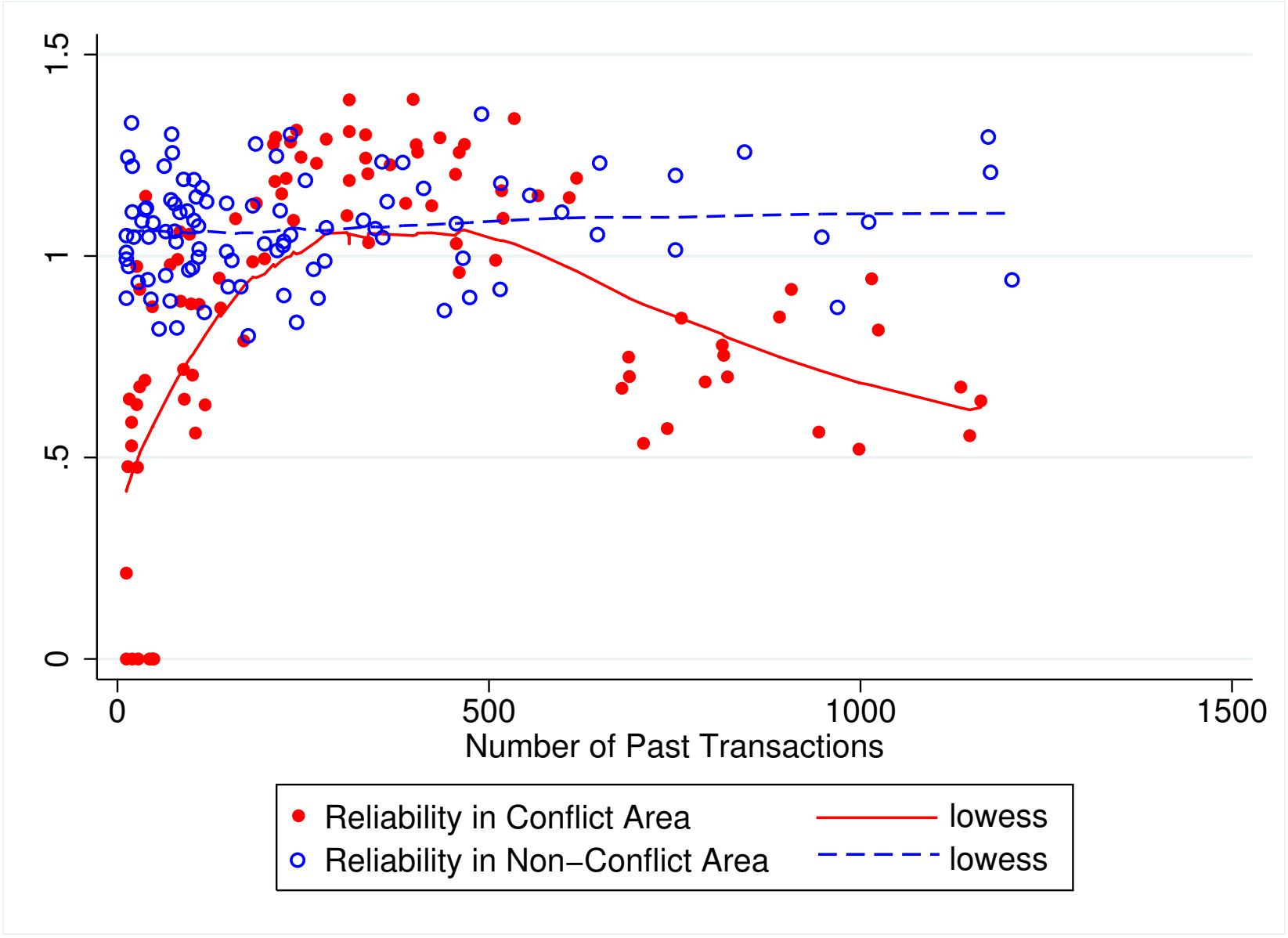


FIGURE 9 - RELIABILITY AND CONFLICT IN DIRECT RELATIONSHIPS

Effort at the Time of the Violence: Direct Evidence

- Evidence supports predictions of the limited enforcement model with learning about the seller's type.
- The model rests on the assumption that firms in the conflict region could have exerted costly effort to protect deliveries to direct buyers.
- Direct evidence on effort during the violence along two margins:
  - *i*) reducing sales to the auctions
  - *ii*) effort to retain workers during the violence.
- Insurance further ruled out by lack of price renegotiation

Conclusions

- Imperfect contract enforcement is a pervasive feature of real-life commercial transactions $\rightarrow$ relational contracts
- Evidence on the structure of informal arrangements in supply relationships $\rightarrow$ identify salient microeconomic frictions $\rightarrow$ inform policy
- If learning and reputation are important determinants of firms' success in export markets $\rightarrow$ Policy Implications
  - Prior beliefs matter $\rightarrow$ externalities

Other Papers in This Agenda

[I.] Interactions with formal governance

2. Strategic Default and Contractual Forms
   - Trade-off btw price and counterparty risk in forward (coffee) contracts
   - Consistent with Klein, Hart, ...
3. Relationships and Vertical Integration
   - Coffee chain in Costa Rica
   - Consistent with Baker et al. (2002)

[II.] Do relationships matter?

4. Competition and Relational Contracts
   - Coffee mills in Rwanda
   - Competition makes it harder to sustain relationships $\rightarrow$ policy implications
5. Relational Contracts and Saving Committment
   - Kenya Dairy Farmers
   - Relationships can help overcome saving barriers $\rightarrow$ policy implications

Other Paper I

- Flower paper has no structural model. This limits ability to perform counterfactuals (what would those be?)
- Galenianos & Gavazza (2016) have a **very nice** on retail market of illicit drugs
  - illicit drug $\rightarrow$ no CE
  - similar trade-off: reap off client today vs. retain client tomorrow
  - MH in quality + heterog. $\rightarrow$ search $\rightarrow$ scope for relationships
  - Very interesting counterfactuals:
    - legalize, increase penalties
- Method: borrow from labour literature (e.g., Bontemps et al. (1999))
  - Some imposed parameters, some estimated. Transparent identification.
- Framework can therefore be applied to relationship data
  - Analogy with customer base (e.g., Paciello et al. (2015))
  - and with rating systems on electronic platform

Other Paper II

- Meredith Startz (2016) Value of Face-to-Face
  - Lagos traders importing differentiated goods from abroad
  - Face both a MH and search problem with suppliers ... or could travel
  - Cost of travel reveal info on how valuable is to solve MH and search problems
- Interesting counterfactuals (and comparative statics)
- Method: two-steps
  - recover first trade costs/elasticities/matching from the data,
  - then solve the rest through SMM
- Also: Field et al. (2014) and Cai & Seildz (2016) experimental work on relationships.

Ideas for further work ...

Much work remains to be done (very good area to work on)

- Know your context
- Think about theory: TTD, Rents, Shocks
- Open minded about methods (RCT, Structural, ...)

- Coexistance/Interaction of Organizational Forms
  - Carrasco (2018), ...
  - More structural approach needed
- Relationships *within* organizations (not just firms)
- Disfunctional relationships
  - Blouin (2016), Bubb et al. (2017), Casaburi and Macchiavello (P&P)
- ...