

Perishability, Bargaining Power, and Contract Farming: Evidence from Terai, Nepal

Thomas Kopp[†] & Ashok K. Mishra[‡]

[†] University of Bolzano-Bozen & University of Göttingen;
[‡] Arizona State University

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Key messages



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- Farm products vary in their levels of perishability
- Perishability enables buyers to exercise bargaining power
- In Terai region (Nepal) contractors can substantially depress farm gate prices for products of shorter durability
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- 1 Motivation
- 2 Model
- 3 Empirical analysis
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Contract farming in developing and emerging economies

- Vertical coordination is an effective approach to overcome moral hazard (Hennessy, 1996)
- Contract farming increases the incomes of smallholders (Bellemare and Lim, 2016; Dedehouanou et al., 2013; Mishra et al., 2018a; Mishra et al., 2018b)
- However, contract farming also increases the bargaining power of contractors (Sivramkrishna and Jyotshi, 2008)



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Contractors' buying power

- Evidence for monopsonistic market power in contract farming (Little and Watts, 1994; Singh, 2002)

- Other challenges of CF

- However, about 60% of smallholders are happy with the contract farming system nevertheless

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 - Violation of terms of agreements (Singh, 2002)
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Perishability

- Smallholders in developing and emerging economies face time constraints in marketing:
- Time constraints may increase existing contractors' bargaining power over contract farmers (Singh, 2002)
- Little evidence on the impact of perishability on market power
- Perishability is often treated as a binary issue
- However, levels of perishability cover a broad spectrum



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Economic model



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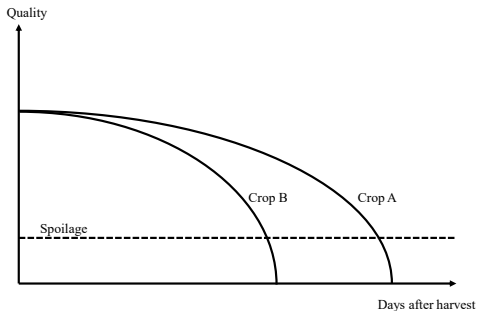


Figure 1: Simplified process of deterioration. Crop *B* deteriorates faster than crop *A*.

Economic model

- Production contracts legislate farm practices (Mishra et al., 2016)
- After harvest, the crop spoils after D periods
- Prices are determined by the contractor upon delivery
- Contractors make “take-it-or-leave-it”-offers to smallholders
- Outside option for farmers: spot market at price p_S
(No premium for attributes as legislated in the contract!)
- One period before spoilage, contractors only have to offer a price slightly above the spot market price
- Backward induction: difference between the price offered on the day of harvest and p_S increases with D



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Empirical model: Difference-in-Differences approach

- LHS variable, Γ_j : advantage of (contract) farmer j over spot market farmers
(=Ratio between the per-hectare profit of contract farmer j and non-contract farmers of the same crop in same village)
- RHS variable of interest, $\ln D_j$: durability of crop produced by farmer j
- $\Gamma_j = \beta_0 + \beta_1 \ln D_j + \sum_i D_i + \epsilon_j$
- D_i : district dummies;
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Empirical application

- Terai region, Nepal
- Home to 48% of the country's population
- Three crops under analysis with different levels of durability
- All crops sold both on spot markets and through contracts



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 - Ginger: 20 days (Mishra et al., 2004)
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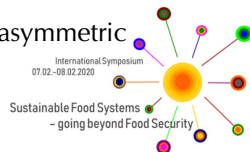
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Data

- Primary survey executed in the Terai region in Nepal in 2014-2015
- Tomato: 602 randomly chosen farmers (261 contract farmers and 341 independent farmers)
- Ginger: 605 farmers (322 contract farmers and 283 independent farmers)
- HYV paddy seeds: 604 seed producers (306 contract farmers and 298 independent farmers)



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Summary statistics

Table 1: Summary statistics

Variable	Mean	Std. Dev.	Min.	Max.	N
$\Gamma_{\text{profitsperhac}}$	2.8	5.4	-23.5	56.6	825
D_j	53.3	72.0	1.0	156.0	826

$\Gamma_{\text{profitsperhac}}$ captures the ratio between business outcome of a contract farmer over the ones of a non-contract farmer in terms of per-hectare profit.

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Results

VARIABLES	$D_{\text{profitsperhac}}$
$\ln D_j$	1.3*** (0.16)
<i>Dummy_District₁</i>	-6.6*** (0.79)
<i>Dummy_District₂</i>	-3.9*** (0.80)
<i>Dummy_District₃</i>	-10.6*** (1.15)
<i>Dummy_District₄</i>	-5.0*** (0.57)
<i>Dummy_District₅</i>	-6.8*** (0.68)
<i>Dummy_District₆</i>	-10.7*** (1.01)
β_0	5.9*** (0.46)
Observations	825
R^2	0.22

Standard errors in parentheses

** $p < 0.05$, * $p < 0.1$

- Positive and significant coefficient of $\ln D_j$ indicates that producers of the crop with longer storability receive a higher mark-up in CF than their counterparts who produce crops with a lower storability
- A 10 percent increase in the storability of a crop increases the mark-up in CF by 3.0 percentage points.



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Positive and significant coefficient of $\ln D_j$ indicates that producers of the crop with longer storability receive a higher mark-up in CF than their counterparts who produce crops with a lower storability

- A 10 percent increase in the storability of a crop increases the mark-up in CF by 3.0 percentage points.



Results

VARIABLES	$D_{\text{profitsperhac}}$
$\ln D_j$	1.3*** (0.16)
$Dummy_District_1$	-6.6*** (0.79)
$Dummy_District_2$	-3.9*** (0.80)
$Dummy_District_3$	-10.6*** (1.15)
$Dummy_District_4$	-5.0*** (0.57)
$Dummy_District_5$	-6.8*** (0.68)
$Dummy_District_6$	-10.7*** (1.01)
β_0	5.9*** (0.46)
Observations	825
R^2	0.22

Standard errors in parentheses

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Distributional consequences

- Contract farmers of HYV paddy seeds make 4.0 times as much profit per ha as independent HYV paddy seed farmers
- For producers of faster perishable crops (tomato and ginger), this factor is only 2.2
- ⇒ if contracting companies could not exercise bargaining power based on the degree of perishability, the second group's profits could increase by a factor of 1.8



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Outline

- 1 Motivation
- 2 Model
- 3 Empirical analysis
- 4 Conclusions



Summary

- Farm products vary in their levels of perishability
- Perishability enables contractors to exercise bargaining power
- In Terai region, Nepal, contract farming is widespread
- Contractors can substantially depress farm gate prices for products of shorter durability
- This decreases farmers' profits by 81%



Thank you very much for your attention!

Questions, comments, suggestions are welcome!

Contact: thomas.kopp@unibz.it

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