Households **i**n **C**onflict **N**etwork H i C N

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Recovery of the Coffee Sector in Rwanda: a Farm-Level Perspective

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Objective and rationale

- Micro-economic analysis of the coffee sector in Rwanda before and after the 1994 genocide using farm-level data.

- The rationale is to assess the economic impacts of distinct factors that have shaped the decline in coffee production during the period 1992-2002 using farm level data from two national representative farm household surveys including a separate survey on coffee cultivation

Political economy of coffee

- Coffee policy under the Habyarimana regime (1973-1994): “Carrot and Stick” approach, i.e., new plants were heavily subsidized, fertilizer distributed, but uprooting of coffee trees was forbidden under Rwandan penal code (June 1978)

- Coffee export during the Habyarimana regime : 60-80% of State revenue depending on annual output and market prices.

- The State government bought the coffee for a fixed price and sold it at the international market in order to guarantee the farmers’ income.

  high international coffee prices ➡ profits made from trade ➡ increased State budget

- Hence, direct link the coffee sector ➡ core state functions

Farmers' livelihood strategies in pre-1994 Rwanda

- By the end of the eighties, 93% of Rwandan population live in rural areas, nearly all of them involved in farming
- Main food staples are beans, bananas, sorhum, sweet potatoes, and cassava
- Main cash crops are coffee and bananas with men's labor mostly involved in cash crop production and animal husbandry and women's labor in food crop production
- System was successful to avoid famine most of the time, combining food and cash crops on slopes and in valleys cultivated, with small livestock and income from beer brewing, other business activities and off-farm income

Consequences of Civil war, Genocide and Mass Migration

- Province level data on coffee farmers 1992 & 2002
- Use of a Conflict-shock index from secundary (non-survey) sources (Justino and Verwimp (2006)) to assess the impact of four conflict shocks on the rural (coffee)economy:
  - Civil war
  - Genocide
  - Mass migration
  - (Counter) insurgency

  ! Note: The index is only indicative of what happened a the provincial level, we cannot infer whether individual farmers were or were not affected by these shocks.

  Result : positive, statistically significant correlation between the conflict shock index and the relative decrease of coffee farmers.

Changes in the socio-economic profile of coffee farmers

Table 3: socio-economic profiles

Coffee Indicators	DSA 1992	FSRP 2002	% change DSA-FSRP
Non-Coffee farmers (panel A)			
Number in sample	564	1102	
Household size	5.4	4.94	-8.5
Land size owned(in hectares)	0.83	0.71	-14.5
Age of the head of the household	45.7	43.9	-3.9
Sex of the head (% female)	24.8	31.0	+25.0
Household Income in nominal pr.	56580	198,000	
Real income per adult equiv	12,870	14,407	+11.9
% under poverty line *	72.7	74.2	+2.1
% under extreme poverty line	55.0	58.4	+6.2
Coffee farmers (panel B)			
Number in sample (and%)	663 (53%)	474 (30%)	
Household size	5.6	5.31	-5.2
Land size owned (in hectares)	0.92	0.80	-13.0
Age of the head of the household	46	46.1	-0.2
Sex of the head (% female)	17.5	30.4	+73.7
Household Income in nominal pr.	60,437	207,000	
Real Income per adult equiv	13,065.9	13,985	+7.0
% under poverty line *	65.3	72.5	+11.0
% under extreme pov line	48.6	56.8	+16.9
Coffee specific indicators			
Years experience as a farmer	27	30.1	+11.5
Years experience in coffee cult.	17	21.9	+28.8
Number of Coffee trees	150.6	103.9	-31.0
Coffee production in Kg per year	48.3	77.2	+59.8
Kg per coffee tree	0.32	0.74	+131.3
Income from coffee in % income	9	7	-22.2

Land tertiles and coffee farms

Major findings broken down by land tertiles (land-poor, middle, land-rich) in the sample show:

- In 1992 there is a clear relationship between land endowment and coffee cultivation, a phenomenon that has disappeared in the 2002 sample
- The number of trees increases by land owning tertile but *decreases* over time
- Kg coffee per tree increases over time, indicating increased efficiency, but less so for the land rich coffee farmers, confirming the well-known inverse relation between efficiency and land endowment

Changes in coffee practices

Table 4: Coffee practices

Practices related to	DSA 1992	FSRP 2002
the age of coffee trees (panel A)		
% of farmers cultivating coffee at time of the survey	53	30.1
% of farmers who cult. coffee in the past but not anymore	9	17.3
of which stopped in 1994 or 1995		25.5
of which stopped after 1995		29.2
% coffee farmers invested in new trees in last 6 years	41	11.8
Age (in years) of the oldest coffee trees	18.4	26.7
the quality of coffee cultivation (panel B)		
Index of quality: % of farmers that practice all of the above	48	13.9
% willing to improve effort if higher quality is rewarded	91	62.9
the price received per Kg (panel C)		
The price you received last year (RwF) (median)	100	200
The price that correctly compensates your efforts as % of price last year	150%	175%
The price at which you would abandon your coffee trees as % of price received last year	80%	60%
The price at which you would uproot your coffee trees as % of price last year	60%	50%
The price at which you would increase the number of trees as % of price last year	150%	200%

Investing in coffee after the genocide : an econometric analysis (1)

Econometric problem: evidence in the economic literature; property rights enhance → investments. However, in a rural economy, formal rights are often lacking and farmers have a de facto usufruct right when they are seen cultivating a plot. Property right endogeneous.

After the genocide: ownership of many plots contested by newcomers, neighbors and family members. Hence, insecurity of land tenure not conductive to investment.

Suitable instrument: farmers' refugee experience. Almost half of the farmers in the 2002 survey have spent time in a refugee camp mid-90s with an average stay of almost two years.

Investing in coffee after the genocide: an econometric analysis (2)

Probit specification:

$$coffeecult_{ij} = \alpha_1 + \delta_p + \beta_1 landright_{ij} + \lambda_1 size_{ij} + \gamma_1 X_i + \varepsilon_1$$

IV Probit specification (controlling for endogenous land rights) :

$$coffeecult_{ij} = \alpha_3 + \delta_p + \beta_3 camp_i + \lambda_3 size_{ij} + \gamma_3 X_i + \varepsilon_3$$

Results

Table 6: Probit regression results

Explanatory variables	Probit,no instruments Coffee Cult.	Probit,with instruments Coffee Cult.
Ownership status	1.01***	3.40***
	(0.22)	(0.5)
Refugee Camp		IV
Size	0.12**	-0.05
	(0.06)	(0.12)
Age	0.004	-0.01
	(0.002)	(0.01)
Sexe	-0.08	-0.16
	(0.07)	(0.06)
Primary education	0.07	-0.06
	(0.07)	(0.14)
Secondary education	-0.13	-0.21
	(0.15)	(0.14)
Province fixed effects	yes	yes
Observations	2906	2515
Wald test statistics		0.30

Current policy

- Break the ‘low price - low quality’ trap
- Aim for ‘fully washed’ coffee which receives a premium in the market
- Liaison with well-known marketing firms to make Rwanda coffee a recogenized brand
- Recent experiences are positive

Information on this project and other microevaluations of households in conflict and post-conflict areas: www.hicn.org