

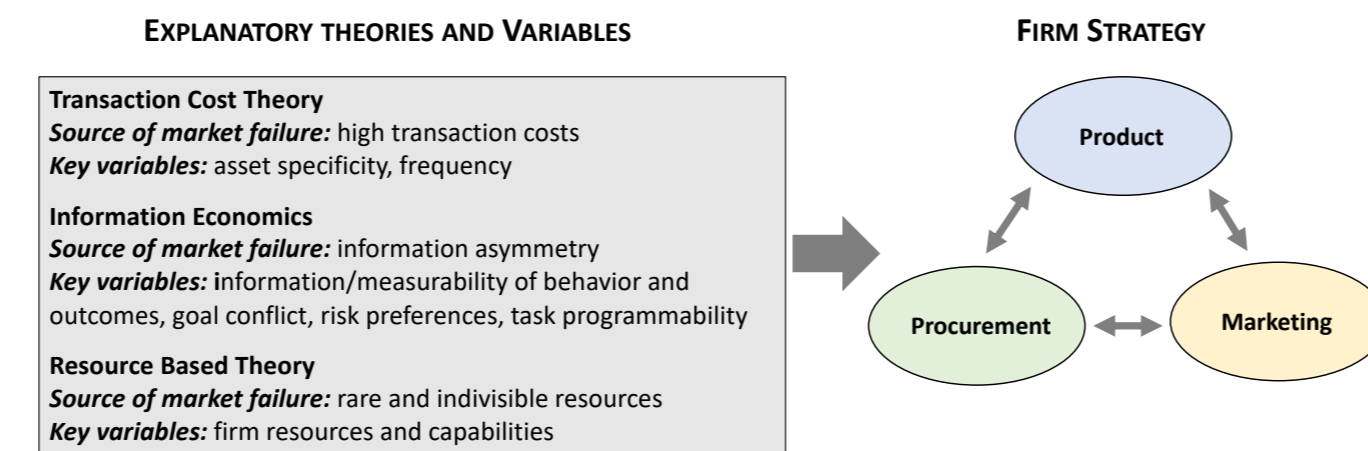
## Motivation, Framework, and Methods

**Motivation.** The dairy value chain is important for employment, nutrition, and economic development in Mali. However, its growth is constrained by market failures along the chain, which originate from the complex characteristics of milk and the Malian market environment. Processors can play a key role in addressing constraints by introducing technological and institutional innovations through their firm strategies.

**Objective & Research Questions (RQ).** Understand how dairy processors establish their product strategies (RQ#1), procurement strategies (RQ#2), and marketing strategies (RQ#3), and identify what policy objectives can help to develop dairy value chains.

**Theoretical Framework.** Market failures explain the existence of the firm, as well as important strategic features, including size, scope, and internal organization (Mahoney and Pandian, 1992; Coase, 1937). In particular, three theories from organizational economics (Figure 1), each corresponding to a potential source of market failure, help to explain firm strategy.

Figure 1: Organizational Economics Framework



Sources: Mahoney & Pandian (1992), Eisenstadt (1989), Rosenman & Wilson (1991), Williamson (1981)

**Methods.** A case study approach was appropriate due to the nature of the research questions and data. Nine processors/cases were selected (Table 1) to assure diversity in different strategies. Data collection took place over three waves in 2017-2018, used semi-structured interviews and quantitative surveys, and focused on processors, their suppliers, and their distributors. In the first stage of data analysis, detailed case narratives were developed, then synthesized by research question. Ongoing analysis will utilize the theoretical framework to explain strategy choices.

Table 1: Overview of Cases and Processor Strategies

Processor	Product Strategy: Product Mix & Inputs Used	Procurement Strategy	Marketing Strategy	Volumes (L/year)	Year Founded	Capitalization	Number of Employees	Other products
<b>Only use local milk (100% of products)</b>								
Artisanal Firm A	Pasteurized milk (LM) Féné (LM)	LM: Supply cooperative MP: N/A	Direct retailing	30,000	2010	\$5,000	4	N/A
<b>Mostly use local milk (95% of products)</b>								
Artisanal Firm B	Pasteurized milk (LM) Féné (LM) Drinking yoghurt (MP/LM) Dégué (MP)	LM: Supply cooperative + relational contracting MP: Spot purchases	Direct retailing	60,000	2000	\$5,000	8	N/A
Artisanal Firm C	Pasteurized milk (LM) Drinking yoghurt (MP)	LM: Supply cooperative + relational contracting MP: Spot purchases	Independent retailers	92,000	2002	\$10,000	5	N/A
<b>Mostly use milk powder (80% - 99% of products)</b>								
Artisanal Firm D	Dégué (MP) Pasteurized milk (LM) Féné (LM)	LM: Supply cooperative + relational contracting MP: Spot purchases	Independent retailers	225,000	2007	\$10,000	17	N/A
Semi-Industrial Firm D	Drinking yoghurt (MP) Dégué (MP) Strained yoghurt (MP) Pasteurized milk (LM,MP)	LM: Relational contracting MP: relational contracting with importers	Independent retailers	1,045,000	1996	\$570,000	52	Juice drinks
Industrial Firm	Pasteurized milk (MP,FM) Drinking yoghurt (MP,FM) Strained yoghurt (MP) Creams & cheese (FM,MP)	LM: Relational contracting MP: Partnerships with foreign manufacturers	Wholesalers	12,000,000	1969	\$3,000,000	125	Juice drinks
<b>Only use milk powder (0% of products)</b>								
Semi-Industrial Firm A	Pasteurized milk (MP) Drinking yoghurt (MP)	LM: N/A MP: Relational contracting with importers	Independent retailers	32,500*	2017*	\$115,000	70	Water
Semi-Industrial Firm C	Drinking yoghurt (MP) Dégué (MP)	LM: N/A MP: Spot purchases	Independent retailers	265,000	1999	\$145,000	20	N/A
Semi-Industrial Firm B	Drinking yoghurt (MP) Strained yoghurt (MP)	LM: N/A MP: Relational contracting with importers	Independent retailers	230,000	1993	\$250,000	19	N/A

Notes: Féné is a traditional full-fat yoghurt that is typically made by leaving pasteurized milk to ferment with or without a local culture. Dégué is a mixture of sweetened lait caillé and small steamed millet balls. For Semi-Industrial Firm A, annual volumes are a projection since it had been operating for less than one year. Year founded represents the start of dairy operations.

**Acknowledgments:** The authors gratefully acknowledge funding from USAID through the Feed the Future Innovation Lab for Food Security Policy (FSP)

## RQ#1: What determines firms' choice to use local vs imported milk?

Case respondents cited several factors driving their choices:

- **Price** of local milk (LM) compared to less expensive milk powder (MP).
- **Available supply** of LM varies greatly throughout the year and across actors.
- **Perishability** of LM, which introduce challenges in transport, production, and storage.
- **Product type.** Traditional yoghurt *féné* is made entirely from LM. Strained yoghurt and *dégué* are made from MP. For other products, input composition varies.
- **Fat and protein content** of LM is relatively low, limiting processing options.
- **Firm size & technology.** Firms mostly using LM are smaller and artisanal. Semi-industrial and industrial firms depend on MP.
- **Social responsibility.** Firms using LM have made some social commitment to do so.

## RQ#2: How do firms procure local milk?

Key constraints include the high cost and unreliability of electricity, and the high variability of LM supply in terms of quality, delivery timing, and availability. Processors respond with two broad strategies:

**Relational contracting.** In the most common strategy, processors procure LM from large farmers, cooperatives, or intermediary traders. Suppliers deliver milk to processors who conduct minimal testing. Processors and suppliers typically commit to a certain daily volume and delivery time. Payments are usually immediate, but suppliers can provide credit ranging from one day to a month.

**Supply cooperative.** Over 150 artisanal processors, organized in a supply cooperative, coordinate milk transactions with eighteen producer cooperatives. Transaction terms are similar as above. The supply cooperative takes a 6% margin to cover operations and provides marketing assistance to members.

## RQ#3: How do firms market dairy products?

Key constraints include intense competition, weak cold chains, and that dairy product quality can be highly variable and costly for consumers to observe. Processors distribute and promote dairy products using three broad strategies:

**Direct retailing.** Small artisanal processors maintain direct contact with consumers by selling from their own specialized retail points or homes. They use "traditional" packaging to communicate the qualities and LM contents of their products.

**Independent retailers.** In the most common strategy, artisanal and semi-industrial firms of intermediate size market through retailer clients. In verbal contracts, processors provide to retailers delivery services, a product warranty, the option of short-term credit, and a margin of 15% to 20%. The youngest and smallest firms are most generous in their terms. To communicate more directly to consumers, processors use enhanced plastic packaging, and the most capitalized firms make limited investments in mass advertising.

**Independent wholesalers.** The industrial processor markets through 150 wholesalers who resell to their own network of buyers, including retailers and intermediaries. In verbal contracts, the processor provides delivery services, a limited warranty, the option of limited credit, and a 20% margin that is shared with the other downstream actors. The processor builds and leverages brand recognition through mass advertising and a very large distributional reach.

## Policy Implications

Preliminary results suggest that several policy objectives could greatly improve the competitiveness of Malian dairy value chains. These include reducing the per unit production costs of raw milk while stabilizing supply; improving the availability and reliability of electricity; adopting and enforcing appropriate quality standards; and promoting value chain actors' access to cold chain assets, new dairy product concepts and production technologies, and packaging options.

