

## Consumer search and firm location: Theory and evidence from the garment sector in Uganda

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*How do consumers' information frictions affect firms' choice of location within a city? This paper combines an original data collection and a quantitative equilibrium model of consumer search and firm location to answer this question. It finds that information frictions (i) contribute to 41% of the concentration of sales in the central part of Kampala and (ii) limit the ability of high-quality firms to attract customers, allowing 37% of lower-quality competitors to survive. Counterfactual scenarios show that the introduction of an e-commerce platform would induce a large share of firms to disperse, while also causing customers to shift to high-quality businesses. By contrast, commonly adopted decongestion policies that discourage central clusters without solving information frictions would disproportionately harm high-quality firms by increasing consumers' costs of finding high-quality products.*

### Introduction

Within cities the economic activity is spatially concentrated, with firms producing and selling similar products locating next to one another (Datta and Sudhir, 2011; Couture and Handbury, 2020; Leonardi and Moretti, 2022). A large part of the literature studying the internal structure of cities has explained this phenomenon through the lenses of production externalities that arise from sharing *knowledge*, *suppliers* or *workers*.<sup>1</sup> This paper combines a theoretical model and original data to quantify the role of an additional channel: agglomeration driven by *consumers' information frictions*.

The key intuition is the following: when consumers are imperfectly informed about the variety of goods sold in the market, they are forced to visit firms in person to learn about product characteristics and availability. This is particularly true in low-income settings, where both customers and firms have limited access to information technology. Since traveling for in-person visits is costly, consumers will favour spatially concentrated firms that let them minimise the cost of gathering information. This generates a trade-off in firms' location decisions. On the one hand, due to information frictions, locations with a high number of firms attract larger pools of customers – incentivising firms to agglomerate. On the other hand, customers in these locations are shared with a larger number of competitors – incentivising firms to disperse. If the first channel prevails, firms have a demand-side incentive to agglomerate.

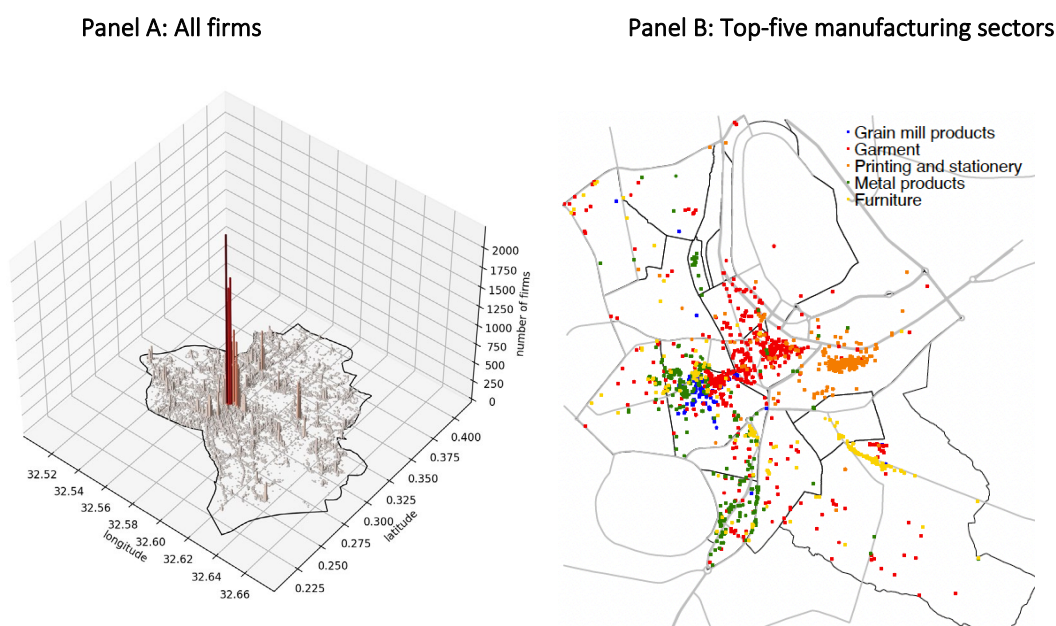
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<sup>1</sup> Ahlfeldt et al. (2015); Allen et al. (2015); Monte et al. (2018); Dingel and Tintelnot (2020); Owens III et al. (2020).

## Methodology

The setting of this study is the garment sector in Kampala. Here, 40% of all establishments operate within 2 km of the central district – the *core* – with firms typically clustering next to businesses in the same sector (Figure 1). To shed light on the drivers of firm agglomeration, I collect data from 600 garment firms and their customers across the city. Firms were randomly sampled from an initial census of more than 2,400 establishments across several locations within Kampala. The collected dataset combines transaction data, which allows estimating demand, customer data, which provides evidence on consumer search, and a mystery shoppers exercise, which yields accurate measures of product quality. I use the data to document a set of empirical patterns that are suggestive of (i) consumers being affected by search frictions and (ii) firms internalising these frictions in their choice of location. I then develop a model of consumer search and firm location to *quantify* the importance of information frictions for the spatial concentration of firms within the city.

Figure 1: Spatial Distribution of firms in Kampala



In the model, information frictions arise because consumers only observe their preferences over varieties upon visiting firms in person. Intuitively, this means that they may know what item they would like to buy (a skirt, a dress, a shirt etc.), but may be unsure about the colour, the material or the style of garment that they prefer until they see the product in person. To do so, they must pay a transport cost to the area where the firm is located. However, once in a location, the marginal cost of visiting a store is decreasing in the density of firms. Since high-density locations are further away from residential areas, consumers trade off larger transport costs to denser locations, with lower within-location search costs.

Firms offer goods of different qualities and varieties. They choose location simultaneously and, once in a location, they compete in prices. An increase in the number of businesses operating in a location impacts the firm's variable profits, and hence the choice of location, in three ways: (i) it attracts a larger number of customers to the location (i.e. the *market-size effect*); (ii) it intensifies the price competition within the location

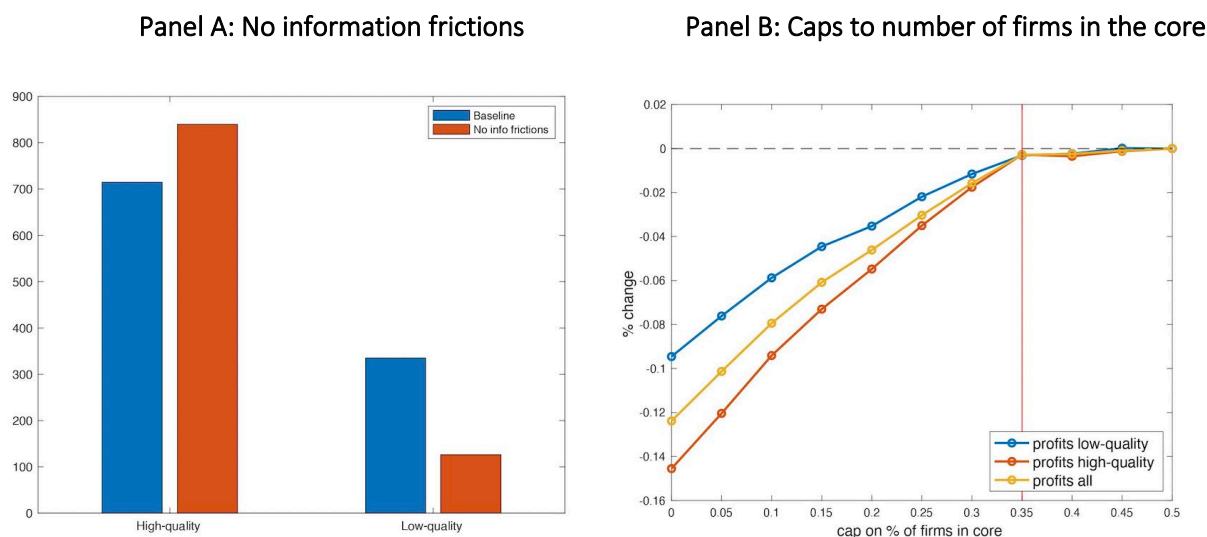
(i.e. the *market-share effect*); (iii) it attracts suppliers of external labour, thus lowering the marginal cost of labour (i.e. the *supply-side externality*). As the size of the agglomeration increases, high-quality businesses capture a larger share of the additional customers attracted by variety. Therefore, they are the ones benefitting the most from locating in areas with a high concentration of firms.

## Main Findings

I estimate the model using the newly collected data and construct counterfactual scenarios with two aims in mind: (i) assessing how the equilibrium outcomes, in particular the spatial distribution of firms, would change in the absence of information frictions; (ii) evaluating the welfare effects of policies that are currently on the agenda of Ugandan policymakers.

I find that eliminating information frictions would induce 8.2% of firms to relocate outside the core. Because most firms that would move to the periphery are high-quality, this would cause a 41% drop in the share of sales concentrated in the core. By allowing customers to observe and compare all products in the market, removing information frictions would enhance firm competition and lead to a 14% and an 18% decrease in prices and profits respectively. These averages mask substantial heterogeneity across high and low-quality firms. High-quality businesses would gain considerable market share and experience a 17% increase in profits (Figure 2, Panel A). By contrast, at the new equilibrium, 37% of low-quality businesses would make losses and be better off exiting the market. Overall, eliminating information frictions would lead to an 11% increase in customer welfare, driven by lower prices and access to a larger number of product varieties.

Figure 2: Firm profits in counterfactual scenarios



## Policy Impact

I use the model to evaluate the welfare implications of two sets of policies that are either under discussion or being implemented in Uganda: (i) the introduction of an e-commerce platform, and (ii) urban policies aimed at decongesting the Kampala city centre. With respect to the baseline scenario, the platform would lead to a 39% reduction in the number of firms operating in the core, driven by high-quality businesses relocating in the

periphery. By eliminating information frictions, the policy would harm low-quality firms, whose profits would drop by more than half, whereas it would lead to a 27% increase in the profits of high-quality businesses.

Policies that relocate firms in space without addressing information frictions can backfire. I study the effect of two measures: imposing a cap to the number of firms allowed to operate in the core and banning motorcycle-taxis from the central part of the city. Firm profits would unambiguously decline if caps were imposed. High-quality firms would experience the highest losses, as the larger spatial dispersion of firms would make it more costly for consumers to compare products across different locations and identify the good firms (Figure 2, Panel B). In the latter policy experiment, banning motorcycle-taxis from the city centre would reduce the profits of firms in the core, but increase those of businesses in the periphery. Although these effects would lead 10% of firms to relocate outside the core, the impact on consumer welfare would be negligible.

### **Moving Forward**

This paper offers a case study that highlights the importance of considering demand-side externalities when modelling firms' choice of location within cities. A key finding from this study is that information frictions limit the ability of high-quality firms to attract customers and expand, favouring the survival of low-quality firms in the market. A large body of literature has focused on the supply-side constraints that prevent small firms in low-income countries from growing (see Woodruff 2018 for a review). This paper suggests that demand-side constraints, which have been largely unexplored, may play an equally important role. The next step in this research agenda is to study the role played by information frictions in explaining firm size distribution in low-income countries.

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