



## Focal Points of Market Access: How Marketplaces Shape Rural Development over 50 years

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Marketplaces remain a widespread way of trading in rural areas of low-income countries. How do these gatherings shape development around them, and how can they be leveraged for rural transformation? Focussing on Kenya, I find that fewer marketplaces operate today than in 1970. At the same time, they formed nuclei of rural towns, especially so away from larger cities. To derive policy implications, I extend a model of rural-urban trade with marketplaces that aggregate sparse supply and demand and enable scale economies in transportation. The model explains when new markets emerge, why some decline, and which complementary policies catalyze marketplaces for local development

### A brief introduction

Rural areas in low-income countries rarely look like centers of economic dynamism. In some places, however, this changes drastically if you visit at the right time: On market days, sleepy villages awake into bustling hubs where farmers sell their produce, local entrepreneurs offer services and itinerant traders display goods that are otherwise unavailable. As places where buyers meet sellers, such periodic gatherings are focal points of the ‘market access’ often [argued](#) to be a driver of improved rural welfare.

Yet, neither do we know how marketplaces shape their surroundings – because we lack data on markets’ locations as well as long-term development indicators – nor how they interact with other means of market access, because canonical spatial models abstract from trade happening at dedicated locations. I make progress on both questions in my [job market paper](#), focusing on Western Kenya over the last five decades.

### Excuse me, where do I find the nearest market?

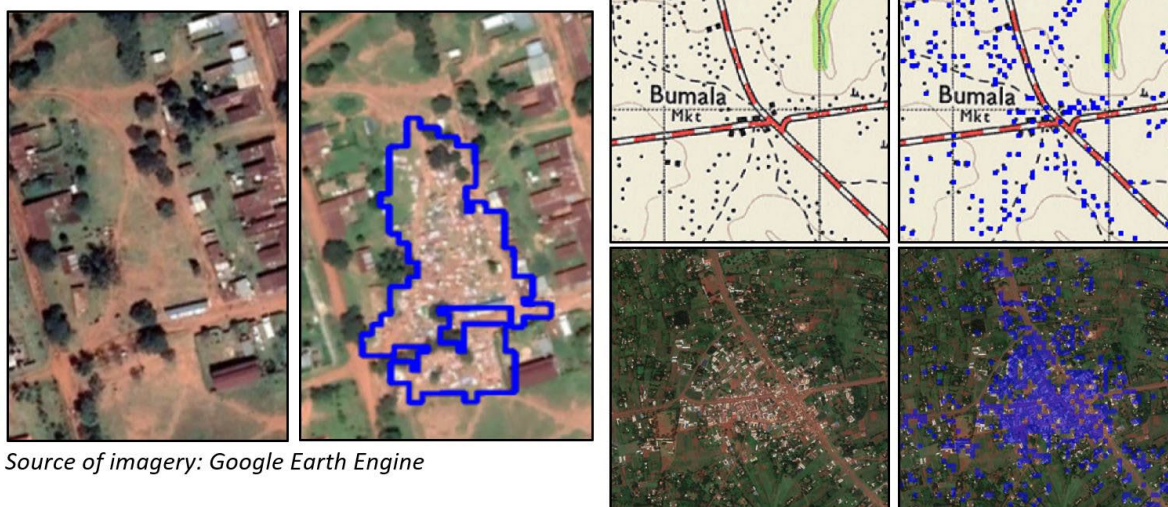
For most people in rural areas, this question would be easy. Few governments, however, maintain consistent market maps, and existing ones can get outdated quickly. This lack of data does not seem to reflect lack of interest: 42 of 47 Kenyan county development plans, for example, mention marketplace-related policies. But it can be prohibitively costly to collect and maintain data on this informal mode of trade away from urban centers.

I use high-frequency satellite imagery to map contemporary periodic markets. In short, I screen candidate locations for areas regularly changing their appearance, e.g. every Friday (Figure 1a). I [confirm](#) that the method does not return false positives – detecting markets where there are none – and that I detect a large share (85%) of known marketplaces. I complement these market maps with a unique [country-wide listing](#) of periodic markets from 1970.



Figure 1: Mapping markets & population density

(a) Marketplace on a Thursday (l) & Friday (market day, r) with remotely-sensed market outline (blue) (b) Houses in blue detected from historical maps (1970; top) and satellite imagery (2020; bottom)



Source of imagery: Google Earth Engine

## Where is everyone?

Having established where markets are and used to be, I turn to measuring development around them. This is a challenge because we lack information about outcomes at small geographical scales, including for individual marketplaces. I adopt an approach from economic history which [argues](#) that in agricultural economies, places with higher population density are likely better off: they can either sustain more people through more productive farming or have diversified beyond agriculture.

To measure population density, I collect and digitize topographical maps from around 1970, on which cartographers painstakingly dotted the locations of individual houses using high-resolution aerial photography. I use a pattern detection algorithm to identify each house, and match these data with their modern, computer vision-based equivalent derived from high-resolution satellite imagery (Figure 1b).

To account for measurement differences across time and space, I rank each of 5,200 2.5km x 2.5km grid cells covering Western Kenya according to their house density. Then I can construct a measure that captures whether house density grew faster in a given grid cell than in others around it, moving up the ranking. I also construct for each cell and year the distance to the closest existing marketplace. With this data, I establish a set of novel facts on rural marketplaces and local development.

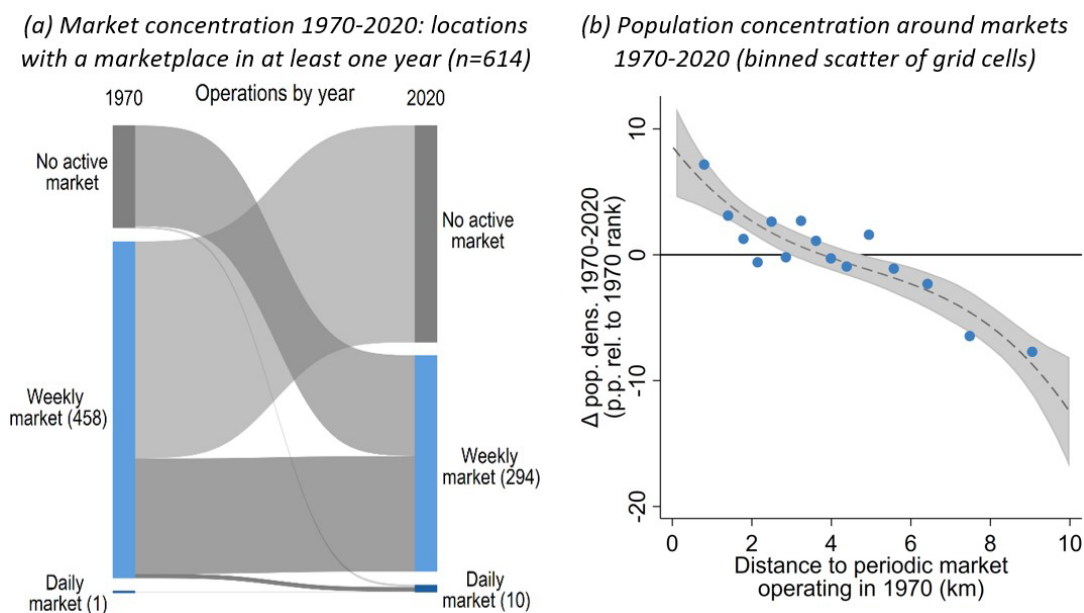
### 1. Markets concentrate...

Despite a fourfold increase in rural population and agricultural trade liberalization, there are 30% fewer marketplaces operating today than in 1970 (Figure 2a). This average masks substantial shifts: 60% of markets that operated in 1970 no longer exist today, while half of all today's markets emerged where European-origin settlers owned plantations and marketplaces were largely absent. The median distance from one market to the next increased from 4.5 to 6 kilometres and only a small minority of weekly markets turned into daily ones.

## 2. ...and so does the population near markets

In contrast to the reduction in marketplaces, population on average concentrated both close to and right at 1970 marketplaces (Figure 2b). I show that this is driven neither by differences in initial population density nor by access to large towns in 1970. Furthermore, even places that were barely populated to begin with, but had a market, grew faster than their surroundings, especially if their market persisted. These patterns suggest that at least some marketplaces contributed to the emergence and growth of rural towns.

Figure 2: Two stylized facts on marketplaces and local development



## A spatial model of informal trade

The new data show that some, but not all marketplaces form nuclei for rural development. For this insight to be useful to policymakers, we need to understand how these patterns arise. To do this, I turn to a spatial model that also provides a sandbox for policy exercises.

In the model, agents either work in a central city producing tradable ('shoes') and non-tradable goods ('haircuts') with increasing returns to scale, or they farm food in the city's hinterland with constant returns. Everyone wants to consume all three goods, so they have to be shipped at a cost from where they are produced to where agents live. I depart from the canonical way of modelling trade flowing directly between locations of production and consumption, and instead integrate marketplaces as trade hubs that can emerge away from urban centers.

Based on real-world characteristics, marketplaces have two functions: first, bulking goods for transport enables scale economies in shipping goods to and from the central city. Second, market-day gatherings make it worthwhile for producers of non-tradables to visit the market: initially as itinerant vendors and, once local demand grows enough, producing in-situ.

## Linking model and data

With scale economies in transportation, farmers may prefer distant, large markets over nearby, small ones, leading to trade concentrating in fewer markets. Cheaper transport to and from marketplaces also makes farming near them attractive with lower consumer and higher producer prices. Furthermore, concentrated demand at marketplaces can support local production ('rural towns'). While tradable goods are cheap to import and hence unlikely to be produced locally, producers of non-tradables benefit from easy access to gatherings of potential customers. This is especially relevant for locations that are relatively shielded from larger and more efficient industries in the city.

## Access to markets or access to the marketplace?

The canonical model suggests that improving transport links between cities and the hinterland only deepens regional specialization, slowing the growth of [potentially beneficial](#) rural towns instead of kickstarting local structural transformation. [Evaluations](#) of road projects [often](#) find similar results. But adding marketplaces to the picture suggests that complementary transport infrastructure can sometimes foster the emergence of towns, depending on the types of places it connects to.

Better connections between the marketplace and the city expose aspiring entrepreneurs at markets to import competition, reducing incentives for local production. Better connections between the marketplace and its hinterland, however, enlarge the customer base and foster local non-agricultural production. These results suggest that policymakers who wish to promote rural structural transformation should invest in local access to trade hubs, rather than solely focusing on connections to larger cities.

## What's next?

This paper examines how marketplaces shape local development, but studying these trade hubs has many other potential applications. Since 2017, satellite imagery has sufficiently high frequency to let us track how market activity changes in real time. These data provide an entirely new measure of short-run changes in local economic activity that can be collected consistently across large areas regardless of conditions on the ground. This throws open the door to better understand the consequences of improved infrastructure, violent conflict, or a changing climate.

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