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David Gomtsyan

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## Focus on Research

# The consequences of financial frictions on urbanization

*Les conséquences des frictions financières sur l'urbanisation*

Publié le 25 mars 2024. [Consulter l'article de blog.](#)

Weak financial institutions may affect developing countries due to slowing the much-needed construction process of residential housing. Using novel data collected from Nairobi, I document considerable variation in the construction duration of new residential buildings, with about 40% of buildings started in 2009 still unfinished in 2018. To understand the role of financial development in cities and urbanization, I develop a model with financial frictions in which households construct individual housing units. Quantitative exercises show that improvements in credit provision can substantially speed up the expansion of the housing stock and increase the city's density by enabling the construction of taller buildings.

*Des institutions financières faibles peuvent affecter les pays en développement en ralentissant le processus de construction des logements résidentiels dont ils ont tant besoin. En utilisant de nouvelles données collectées à Nairobi, notre étude met en évidence des variations considérables dans la durée de construction des nouveaux bâtiments résidentiels. 40% des bâtiments commencés en 2009 sont toujours inachevés en 2018. Pour comprendre le rôle du développement financier dans l'urbanisation, nous avons développé un modèle avec des frictions financières dans lequel les ménages construisent des unités de logements individuels. Les exercices quantitatifs montrent que l'amélioration de l'offre de crédit peut considérablement accélérer l'expansion du parc immobilier, et augmenter la densité de la ville en permettant la construction d'immeubles plus hauts.*

Unfinished buildings are standard in the cityscape of many low-income African countries. The construction process from commencement to completion of simple structures can take decades. These observations raise questions about underlying frictions and their consequences for city development. Rapidly expanding populations in cities are in desperate need of housing. The efficiency with which housing is produced and supplied is, therefore, a vital element of an economy's development path. Yet the economic literature has paid little attention to the causes and consequences of slow construction processes and the preponderance of unfinished construction projects in African cities.

## New data on house contraction in Africa

The first objective of the project was to hand-collect detailed data from satellite images and track the construction duration of individual buildings, their completion status and the number of stories over the 2009-2018 period. Focusing on Nairobi, I document several novel facts. My data show that 40% of buildings are still under construction 9 years after the commencement of construction works. The average construction duration for completed buildings is above 3.4 years. The corresponding figure for the US is one year.

## **Modeling house construction OR A model of house construction**

To understand the role of financial development in the residential housing construction, I use a model in which households earn volatile income and face borrowing constraints. This model allows me to explore how households can initiate construction projects, which can be used to meet their own housing needs and can be rented out to others to generate a stream of income. Housing construction requires determining the size of the building, investing in the foundation and investing in the stories of the structure. The latter part can be implemented over an arbitrary number of periods. I do not impose any time-to-build assumptions on the construction function. The duration of construction depends only on the households' optimal decisions, which, in turn, are constrained by the availability of funds. Households have strong incentives to complete construction projects as soon as possible because houses are income-generating assets.

However, in equilibrium, the construction of individual projects progresses slowly and may take many years. This outcome emerges because of tight borrowing constraints. The significant investment required to construct a building exceeds the per-period incomes of most households, and households cannot finance their projects by debt. As a result, they have to rely on their savings. In this context, households with sufficient funds to invest in the foundation start construction. However, the process may evolve slowly depending on the dynamic evolution of their income and the planned size of the building. While taking into account the expected slow pace of construction, households optimally choose to build structures with fewer stories. To assess the quantitative implications of the model, I calibrate my model using parameters from the literature and my collected data on building characteristics in Nairobi.

## **Quantifying the implications of financial frictions on cities**

I use the calibrated model to study the consequences of different policies. For example, I compare an economy with a financially developed system, where collateralized loans are available, to an economy without borrowing. In the long run equilibrium, the average building has 25% more stories in the economy with lending, than without. There are also substantial differences between the two economies during the transition phase. In the economy with lending, 93% of structures are completed after the initial nine years. The corresponding number in the economy without lending is only 21%.

These findings hold promise for policy interventions. A large body of economic literature argues that incomes are higher in urban areas, and urbanization can improve living standards in developing countries (Gollin, Lagakos, and Waugh, 2013). However, urbanization depends on the capacity of cities to provide proper living conditions to potential migrants from rural areas. Furthermore, the urban economics literature has highlighted the role of city sprawl on commuting time (Harari, 2020). The results of my paper show that policies oriented towards the improvement of credit for residential construction purposes can substantially increase the speed of housing provision and, hence, the transition from rural to urban economy. Moreover, it can lead to an equilibrium with taller buildings, which can reduce the city's sprawl and improve its productivity. My calculations show that more urban sprawl caused by financial frictions increases commuting times by at least 2.6%. I also use the model to study the effectiveness of interest rates and construction cost subsidies. According to my simulations, construction cost subsidies are more effective in increasing the average building height, and the output gains resulting from such subsidies exceed their costs.



David Gomtsyan

Post-doctoral Researcher,  
CERDI-UCA-CNRS-IRD

**Reference:** Gomtsyan D., [Building the city under financial frictions](#), *Review of Economic Dynamics*, Vol.52, 2024, pp.70-83.