Subsidized Housing in the Developping World: Evidence from South Africa

Stefano Polloni
joint with Ben Bradlow and Will Violette

September 2017

Motivation

- Rapid Urbanization of the developping world during the past two decades.
- Significant portion of new city-dwellers live in slums.
  - Africa's estimated slum population doubled in 1995-2015.
- Disagreement on whether slum-dwellers are in a transitory phase (Glaeser, 2011) or stuck in proverty traps (Marx, 2013).
- Regardless, slum living conditions remain a concern:
  - inadequate living space
  - poor sanitation and water access
  - high crime levels
  - low public goods provision

Motivation

Standard policy portfolio to address these issues:

1. Changing property rights and land regulations
   - land titling (Galiani & Shargrodoksy 2010, Field 2007)
   - reducing minimum lot size (Lall et al. 2007)
2. On-site slum upgrading/servicing (Galiani et al. 2017, Field and Kremer 2008)
3. Subsidized formal housing (Picarelli 2017, Barnhardt et al 2015)

Due to data constraints and lack of experimental variation, evidence for each three remains scarce, with no answer on the best policy mix.

This Paper:

- Focus on ❸ , the provision of subsidized housing.
- Learn from the South African experience with post-apartheid Reconstruction and Development Programme (RDP):
  - Since 1994, delivery of $\sim$3 million freestanding houses across the country for households with income $<$ \$R3500 (\$260) per month.
- Existing literature in development economics treats subsidized housing as relocation programs (e.g. MTO), focusing mainly on outcomes of relocated households.
- Subsidized housing is also a place-based policy that affects the surrounding neighborhoods. (Diamond & McQuade 2016)
- These external effects have been studied in the developed world (Diamond & McQuade 2016, Baum-Snow & Marion 2009, Schwartz et al. 2006), but not in a slum mitigation context.

Research Questions

1. What is the value of subsidized housing to both **recipients** and **surrounding residents**? How does this depend on the location and density of delivered units?
2. How does the provision of public housing impact the growth of surrounding informal housing?
   - many developments built near existing informal settlements.
   - informal backyard shacks are common occurrence.

3. Given 1 , 2 , and the costs of construction/land, is this policy successful?

   Are there potential welfare improvements in changing how and where housing units are delivered?

RDP housing in a nutshell

- The RDP is a policy framework implemented in 1994 to address several socioeconomic issues under apartheid rule.
- Includes a large housing subsidy scheme, which provides eligible households the opportunity of owning their first house.
- Eligibility is based on citizenship, marital status and income.
- Program recipients receive a one-off capital subsidy (the house) at very low or no cost.
- Large excess demand; allocation process loosely regulated by various priority systems and wait lists, with many noted cases of corruption.
- Supply is planned by municipal and provincial housing agencies, construction is outsourced to private developers, with constraints on costs per unit, services access, and rooms/lot sizes.

RDP housing as a relocation program

Previous work has examined RDP housing as a relocation program, tracking households that move from slums into RDP housing. Results are inconsistent.

Picarelli, 2017:

- Panel Survey 2008-2012, 723 household living in 6 largest metros
- Fuzzy RD using $R3500 threshold for eligibility
- RDP recipient households, on average, are displaced further away from the CDB, and reduce their total labor supply upon receiving their house.

Franklin, 2015:

- Panel Survey 2002-2009, 1097 households in Cape Town area
- RDP recipient households report increased earnings, driven by higher female employment rate.

RDP as a place-based policy

- RDP houses are usually built as part of extensive residential developments, with considerable heterogeneity in location and density.
- Their effect may extend well beyond the program recipients, affecting location decisions of other households and the construction decisions of private developers.
- Quantifying these effects is important for comprehensive policy evaluation.

RDP as a place-based policy

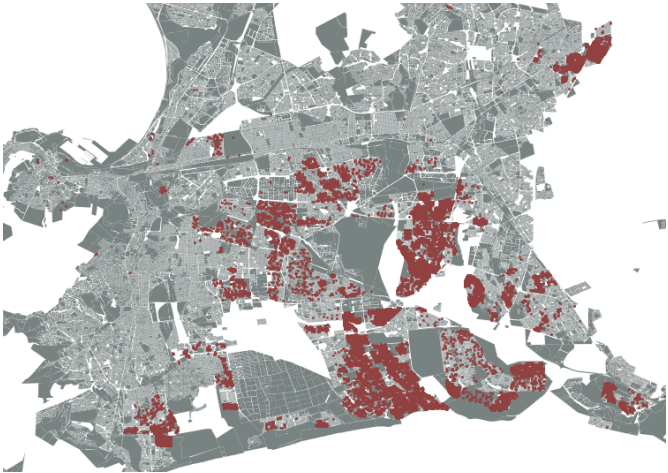


Figure: RDP properties (in red) surrounding Cape Town

Data Sources

Three main data sources:

1. Deeds data:

   - Universe of housing transactions recorded during 2003-2011 in all affordable areas[1] across the country. ($\sim$1.2M transactions)
   - Exact geographic location of traded property, but limited information on characteristics other than price and lot size.
   - RDP transactions noisily identifiable by filtering on Seller Name, price and lot size ($\sim$400K transactions)

[1] defined as census enumeration areas with mean house price value less than R500,000 in 2010.

Data Sources

2. Buildings inventory data:

   - 2 waves - 2001 and 2012 - of exhaustive building census based on satellite imagery, covering the entire province of Gauteng (contains Johannesburg and Pretoria).
   - building stock differentiable by various categories: residential, commercial, industrial, etc.
   - within residential, ability to differentiate formal from informal housing, including backyard shacks.
   - Hopefully access to National Coverage and more waves very soon...

Data Sources

3. Census data:
   - Full national coverage of the 2001 and 2011 census, at the small area level ($\sim$ 170 households per small area)
   - Basic information on demographics, employment, income, education and dwelling characteristics.

Goals with this data

1. Estimate impact of RDP construction on surrounding property values.
   - Assess value to neighboring residents in formal housing sector.
2. Estimate the response of informal housing to RDP construction.
   - Asses value to neighboring residents in informal housing sector.
3. Examine RDP resale transactions to infer value to program recipients.
4. Develop a theoretical framework to map the obtained reduced-from estimates into welfare effects.
   - draw from the model in Diamond & McQuade (2016), or something along the lines of Busso, Gregory and Kline (2013)

Local RDP impact on housing prices

RDP projects are often built as small neighborhoods on formely empty land plots, or former informal settlements.

A first-pass DD aproach:

- Identify areas where many clustered RDP houses were sold at similar dates.
- Examine house prices in adjacent areas, before and after construction, near and far from RDP project.
- Rely on spatial proximity for identification.

Local RDP impact on housing prices

- Issue: the parent project of each RDP unit is not observed in the transaction data, but only geographic coordinates and date when first allocated.
- Solution (?): Use spatial clustering methods to group RDP transactions into projects.

Local RDP impact on housing prices

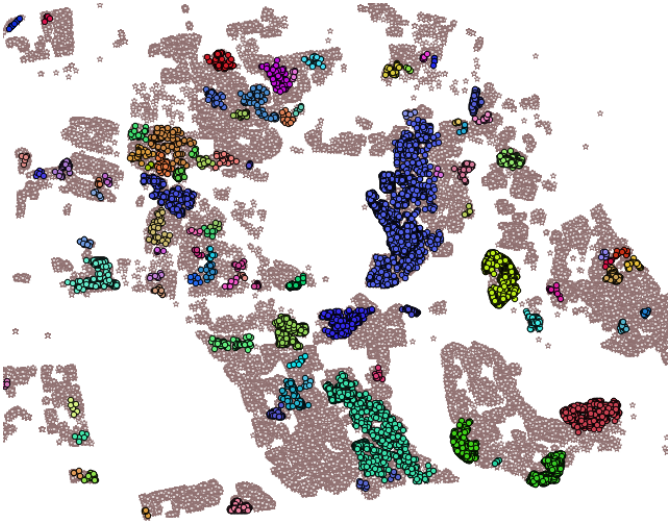


Figure: DBScan clustering algorithm

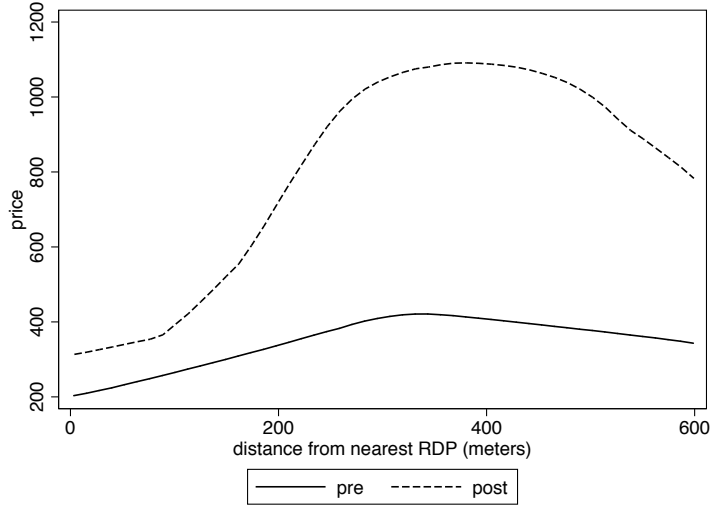
Local RDP impact on housing prices

Strategy:

- run DBScan using gps location of RDP transactions.
- verify that transactions within each identified group occurs closely around the same year.
- examine price of non-RDP transactions occuring within a fixed distance of the projects, before and after the mode transaction year.

Local RDP impact on housing prices

Raw Means:



Local RDP impact on housing prices

Net of Province-by-Year-by-Month FE and Project FE: