’Little Boxes All the Same?’
Evaluating Low-Cost Housing in South Africa’s Main Metros

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Rapid urbanization in developing countries—proliferation of slums at the peripheries of cities.

- In 2014, almost \( \frac{1}{4} \) of urban population lived in slums.
- Sub-Saharan Africa (SSA) has the largest share of slum population in the world (199.5 million in 2015), growing at 4.5 percent per year.
- Not only a temporary phenomenon [Marx et al. 2013], but poverty traps.
Challenges of Urbanization in Developing Countries

Housing policies have become cornerstones of urban and development policy.

Success depends on allowing the poor to benefit from urbanicity [Brueckner and Lall 2015; Glaeser 2011] ≠ low-cost projects at cities peripheries, poor materials and poor servicing.

Benefits of relocating may well be overcome by its costs, i.e. increased commuting and services costs, loss of social networks, poor employment opportunities in the new areas = Low or zero social returns [Barnhardt et al.2015].
South Africa

Same challenges of other urban areas in SSA:

- In 2014, 1/4 of urban population lived in slums.
- High levels of unemployment, but small informal sector (30%
- Large commuting times and costs (90min daily on avg.2013).
- High levels of inequality
- **PLUS Dysfunctional urban structures = Heritage of apartheid planning.**

- **Spatial dislocation** between where the poor live and employment is located [Banerjee et al 2008]
Housing Policy

RDP Housing since 1994

One-off capital subsidy to obtain first house - 90% used to finance the construction of free standing houses in greenfield developments. The house is then transferred to the qualifying beneficiary on an ownership basis.

Results:

- 2.8 million dwellings in 2014
- 24% of the total formal housing stock
- From 5.5% of HHs in RDP in 2002 to 9.4% in 2009 and 13.5% in 2013.
Objective: Estimate the causal effect of this large public housing program on labour market participation, unemployment and basic welfare indicators of the programs recipients across SAs 6 main metropolitan areas.

Data: 3 waves of panel household data [2008-2010-2012], Household Level analysis (3500 HH)

Research Design: Local Average Treatment Effect (LATE) through a fuzzy regression discontinuity design (RDD) that exploits the arbitrary eligibility cutoff of the policy at a certain income threshold.
Overview

1. Policy Setting
2. Data
3. Empirical Strategy
4. Results
5. Policy Implications
National Housing Subsidy Scheme (or RDP):

- Developed in 1994 to redress housing inequality left by Apartheid

- **Basic Eligibility Criteria:**
  1. South African or permanent Resident
  2. 18+ years
  3. Married or living with partner or have financial dependents
  4. First time owner
  5. Never have received subsidy before
R15,000+: Regular market (15% of population)
Financial Sector Charter (commitment to invest in housing finance, targets population below R15,000)

R3501-7000: FLISP (since 2005)
- Coupled with mortgage
- House value <R300,000
- Very poor take up (<1000 cases).

R0-R3500 HH Income: Eligible for government Housing Subsidy (RDP) (60% of population in 2012)
- 40m2 house on 200-250m2 plot of land - freehold tenure; sale restriction for 8 years
- Waiting list by municipality (average 5 years)
- House Value:
  R80,000 + land and services = R100,000-200,000.
- Free of charge ≤ R1500
- Lump sump R2479 otherwise
Phase 1
Form at the provincial or municipal housing department, + proof of qualification. National Housing Subsidy Database (NHSDB) - keeps records of all subsidy applicants across the country. Recorded against ID.

Phase 2
Allocated to RDP waiting list. Allocation is made in date order of registration. In 2009 the avg.time in the waiting list was 5 years (GHS) and 13.5 percent HHs had at least one member on a demand database.

Phase 3
Eligibility criteria are re-assessed after successful allocation to a project. If still compliant, households are given a property (problem with the deed).
First 3 waves (2008, 2010, and 2012) of the National Income Dynamics Study (NIDS) panel, conducted by Southern Africa Labour and Development Research Unit (SALDRU) at the University of Cape Town.

<table>
<thead>
<tr>
<th>Final Sample</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Households</td>
<td>3542</td>
</tr>
<tr>
<td>Individuals</td>
<td>8825</td>
</tr>
<tr>
<td>RDP %</td>
<td>9.13</td>
</tr>
</tbody>
</table>
## DATA

<table>
<thead>
<tr>
<th>II. Households Socio-Demographics</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Head</td>
<td>0.24</td>
<td>0.43</td>
<td>3,542</td>
</tr>
<tr>
<td>Age Head</td>
<td>37.42</td>
<td>15.22</td>
<td>3,539</td>
</tr>
<tr>
<td>Household Size</td>
<td>3.46</td>
<td>2.34</td>
<td>3,542</td>
</tr>
<tr>
<td>Receives Government Grant</td>
<td>0.38</td>
<td>0.48</td>
<td>3,529</td>
</tr>
</tbody>
</table>

## III. Residential Characteristics (Households)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Refuse Collection</td>
<td>0.11</td>
<td>0.32</td>
<td>3,020</td>
</tr>
<tr>
<td>Access to Electricity</td>
<td>0.87</td>
<td>0.34</td>
<td>2,986</td>
</tr>
<tr>
<td>Informal Dwelling (large definition)</td>
<td>0.25</td>
<td>0.43</td>
<td>3,542</td>
</tr>
<tr>
<td>Common to have thefts in neihborhood</td>
<td>0.51</td>
<td>0.49</td>
<td>2,998</td>
</tr>
<tr>
<td>Time taken to nearest train by foot (wave 1)</td>
<td>34.42</td>
<td>33.77</td>
<td>516</td>
</tr>
<tr>
<td>Time taken to nearest mini taxi by foot (wave 1)</td>
<td>10.26</td>
<td>8.83</td>
<td>894</td>
</tr>
<tr>
<td>Average Distance to CBD (km)</td>
<td>25.70</td>
<td>16.18</td>
<td>3,542</td>
</tr>
<tr>
<td>Average Distance to CBD (min. by mode of transport)</td>
<td>123.05</td>
<td>77.95</td>
<td>3,542</td>
</tr>
<tr>
<td>Average Distance to Main Employment Nodes(km)</td>
<td>27.16</td>
<td>15.15</td>
<td>3,542</td>
</tr>
</tbody>
</table>
Empirical Strategy

- Identification (ID)
- Probability of treatment at cutoff (Prob)
- McCrary density test of assignment variable (MC)
- Local Polynomial density test (Poly)
- Smoothness of covariates at cutoff (Covs)
- Reduced Forms (RF)
- First Stages (FS)
Discontinuity Results on Labour Supply (1)

STD.DEV

Labor Supply

Domestic work

Hrs

Empl.

-0.664*

-0.879***

-0.319

0.1

-0.795

-1.301**

-1.590*

-0.127

Linear

Poly2

F stat: 25.5

F stat: 22.45
Discontinuity Results on Labour Supply (2)
Discontinuity Results on Welfare Indices

![Graph showing the impact of different factors on welfare indices.](image-url)
Discontinuity Results on Distances

- CBD: 13.41***
- Employment nodes: 12.19***
- Labour Supply Cost: 0.567*

Linear
F stat: 19.22
Results on Household Composition

-1.782*
WHAT IS HAPPENING?

- Household re-composition
- Higher labour supply cost
- Loss of Social Network
- Is it all due to spatial mismatch?
Gauteng Map 1

<table>
<thead>
<tr>
<th>Major economic centres</th>
<th>Mean distance (km) from public housing to the nearest economic centre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boksburg</td>
<td>14.6</td>
</tr>
<tr>
<td>Centurion</td>
<td>13.7</td>
</tr>
<tr>
<td>Johannesburg</td>
<td>20.3</td>
</tr>
<tr>
<td>Midrand</td>
<td>7.8</td>
</tr>
<tr>
<td>Pretoria</td>
<td>25.7</td>
</tr>
<tr>
<td>Sandton</td>
<td>17.3</td>
</tr>
<tr>
<td>Vereeniging</td>
<td>17.3</td>
</tr>
<tr>
<td>Gauteng</td>
<td>17.8</td>
</tr>
</tbody>
</table>
Main Problems with RDP Policy Today

1. Financial considerations
   - Despite LARGE investments SA cities are still on top in terms of av. daily commuting trips, costs and time with respect to other cities in SSA
   - Est. housing backlog: **2 Million dwellings**
   - Est. cost: R800-billion until 2020 (FFC 2012)
   - Transport subsidies are even higher than housing subsidies!
   - In country where majority uses: **MINIBUS TAXI** (71% of commuters) - receives only 1% of public transport subsidies [Kerr 2015]

2. Social/Political considerations
   - Social perceptions: "It’s a house that was given for free and it gives value to our lives as well as dignity  ”It's a free house given to the poor by Mandela"
Conclusions and Policy Implications

1. Problems with policy implementation per se (municipality role, waiting list, materials etc.)

2. Issue with ‘subsidizing’ housing and transport BUT NOT addressing spatial layout (low densities, ghettoization of the poor...)

3. What POLICIES?

   - CONNECTIVITY-ACCESS policies
   - Housing - SS: Rent vs ownership, land zoning regulations
   - Housing - DS: Finance, upgrading
   - Densification policies
Appendix
Empirical Strategy

I am interested in testing the effect of receiving RDP housing on labour market participation and other welfare outcomes of beneficiary households, with an equation of the following form:

\[ Y_{hmt} = \gamma_0 + \gamma_1 \cdot D_{hmt} + \varepsilon_{hmt} \]

\( Y_{hmt} \) is the outcome of interest for eligible households
\( D_{hmt} \) is a dummy variable equal to one if the household receives RDP housing in period \( t \) and zero otherwise
\( \varepsilon_{hmt} \) is the unobservable error term.

In the above \( h \) indexes for household level variables in metro-area \( m \) (1...6) at period \( t \) (1...3).

Causal Effect: I exploit the discontinuity created by the eligibility formula of the RDP subsidy, to estimate LATE \( \Rightarrow \) Income-band rule which limits eligibility at a monthly household income of \$3500 (\( X_{hm,t-1} \)).
<table>
<thead>
<tr>
<th></th>
<th>Adult Labor Supply</th>
<th></th>
<th>Fraction of employed HH members</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Previous HH income ≤ 3500 [Below]</td>
<td>0.167*** (0.023)</td>
<td>0.151*** (0.039)</td>
<td>0.175*** (0.055)</td>
</tr>
<tr>
<td>HH income T-1 centered at cutoff</td>
<td>-0.000*** (0.000)</td>
<td>-0.000*** (0.000)</td>
<td>0.000 (0.000)</td>
</tr>
<tr>
<td>Below x HH income T-1</td>
<td>0.000*** (0.000)</td>
<td>0.000 (0.000)</td>
<td>-0.000 (0.000)</td>
</tr>
</tbody>
</table>

Polynomial Order | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 2 |
Discontinuity F-Statistic | 28 | 24.28 | 12.05 | 9.11 | 26 | 22.45 | 11.07 | 8.27 |
R.sq. | 0.11 | 0.11 | 0.10 | 0.14 | 0.11 | 0.11 | 0.10 | 0.14 |
N | 2700 | 2700 | 1570 | 896 | 2700 | 2700 | 1570 | 896 |

Notes: The table reports the estimated discontinuity (first stage) for selected outcome variables. I only report linear interactions to avoid cluttering the table. Results are similar. [the following applies to all regression tables] Robust standard errors in parentheses are clustered at the household level. Controls when specified include female head, age, race and education level of head, proportion of age > 78, proportion of working age members, household size, as well as electricity access and dwelling quality (except for the neighborhood and amenities indices). *p<0.10; **p<0.05; ***p<0.01