INTRODUCTION

Over the last decade, numerous governments in eastern and southern Africa have (re-)established grain marketing boards & strategic grains reserves (GMBs/SGRs) in order to:

- Reduce price variability
- Improve national food security
- Raise rural incomes and reduce rural poverty

Yet little is known about the effects of the programs on smallholder welfare.

This paper estimates the effects of the maize purchase activities of one GMB/SGR, the Zambia Food Reserve Agency (FRA), on smallholder welfare (incomes, poverty, and calories available).

The FRA buys maize from smallholders at a pan-territorial price that often exceeds market prices for maize in surplus production areas.

MATERIALS AND METHODS

Hypotheses

1. Selling maize to FRA improves smallholder welfare, i.e., FRA has positive direct welfare effects.
2. A priori, the smallholder welfare effects of greater FRA activity in a HH’s district are ambiguous, i.e., FRA may have positive or negative indirect effects.

Data

- 3-wave, nationally-representative panel survey (2000/01, 2003/04, and 2007/08 marketing years)
- 4,286 smallholder HHs in balanced panel
- No evidence of attrition bias
- FRA administrative data on district purchases

Methodology

- Fixed effects (FE) & correlated random effects (CRE) with rich set of covariates
- Instrumental variables (IV) approach → correct for endogeneity of maize sales to FRA
- IV: km to nearest FRA buying depot

RESULTS

Table 1. Maize sales to the FRA by smallholder HHs by landholding size category, 2007/08 maize marketing year

<table>
<thead>
<tr>
<th>Landholding size category</th>
<th>% of smallholder HHs selling to FRA</th>
<th>Mean kg of maize sold to FRA</th>
<th>Category % of total maize sold to FRA by smallholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-0.99 ha</td>
<td>30.3</td>
<td>11</td>
<td>1.3</td>
</tr>
<tr>
<td>1-1.99 ha</td>
<td>34.8</td>
<td>79</td>
<td>10.2</td>
</tr>
<tr>
<td>2-4.99 ha</td>
<td>28.3</td>
<td>139</td>
<td>35.8</td>
</tr>
<tr>
<td>5+ ha</td>
<td>6.5</td>
<td>2,161</td>
<td>52.7</td>
</tr>
<tr>
<td>All HHs</td>
<td>100.0</td>
<td>2,764</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 2. Direct and indirect effects of the FRA on smallholder welfare (FE and IV/CRE estimates)

<table>
<thead>
<tr>
<th>Welfare measure</th>
<th>Direct effect</th>
<th>Indirect effect</th>
<th>Direct effect</th>
<th>Indirect effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total HH income (ZMW)</td>
<td>+177.49***</td>
<td>+122.22</td>
<td>+1,057.69*</td>
<td>-2,825.81</td>
</tr>
<tr>
<td>Poverty incidence (pct. pt.)</td>
<td>-0.18***</td>
<td>+0.44*</td>
<td>-1.42</td>
<td>+1.49</td>
</tr>
<tr>
<td>Poverty gap (pct. pt.)</td>
<td>-0.12***</td>
<td>+0.48**</td>
<td>-3.18**</td>
<td>+2.69*</td>
</tr>
<tr>
<td>Poverty severity (pct. pt.)</td>
<td>-0.10**</td>
<td>+0.48*</td>
<td>-3.58**</td>
<td>+2.90*</td>
</tr>
<tr>
<td>Calories available/person/day</td>
<td>+0.40</td>
<td>-111.00***</td>
<td>128.10</td>
<td>-225.50</td>
</tr>
</tbody>
</table>

Notes:

- ***, **, *: statistically significant at the 1%, 5%, and 10% levels, respectively
- Direct effect: estimated & in the welfare measure given a 100-kg increase in HH maize sales to the FRA, ceteris paribus
- Indirect effect: estimated & in the welfare measure given a 100-kg HH increase in the quantity of maize purchased by the FRA in the HH’s district, ceteris paribus

CONCLUSIONS & POLICY IMPLICATIONS

- Poverty-increasing indirect effects driven by reductions in producer prices for non-maize staple crops, especially rice
- Calorie availability-reducing indirect effects driven by FRA-induced increases in retail maize prices, reducing affordability for maize-buying smallholders
- Careful consideration of other options to raise smallholder incomes and reduce poverty in rural Zambia is necessary.

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